



Parcs
Canada

REPAIR WORK SHOP #3
SMITH WORKSHOP – 1156, MILL STREET
PARCS CANADA

V/RÉF. : CLAC-PIF-901-1501-RATELIERSMTL
N° DE PROJET: 157000048

SEPTEMBER 2015

TECHNICAL SPECIFICATIONS

Architect

Engineer

SECTION DESCRIPTION

01005	Governing specifications
012900	Payment
01300	Submittals
01340	Shop Drawings, Product, Data samples and Mark-up
013529.06	Health and Safety
01410	Testing test
01500	Temporary facilities
01545	Safety requirements
01561	Environmental protection
01600	Material and equipment
01710	Cleaning
01720	Project documents
01730	Operational and maintenance file cards
02050	Demolition work
03100	Concrete formwork
03200	Concrete reinforcement
03300	Cast-in-place concrete
03310	Concrete repair mortar
03350	Concrete finishes and sandblasting work
05120	Structural steel and steel decks
05500	Metal fabrications
06101	Rough carpentry
07620	Metal flashing and trim
07650	Metal siding / roofing
07900	Sealants
08120	Doors, frames and windows
08360	Overhead doors
09900	Painting

DRAWING LIST

ARCHITECTURE

Plan N°	Title	Rév.
CL-03-169-05	Title And Key Plan	00
CL-03-169-06	Ground Floor Plan	00
CL-03-169-07	Roof Plan	00
CL-03-169-08	Exterior Elevation	00
CL-03-169-09	General Sections And Details	00
CL-03-169-10	Details	00

STRUCTURE

Plan N°	Title	Rév.
S100	Front Page And General Notes	00
S101	Roof Plan, Elevation and Cuts Existing / Demolition	00
S102	Roof Plan, Elevation and Cuts Existing / Construction	00
S103	Cuts And Details	00

1. DEFINITION OF TERMS

- .1 «The Engineer» designates the project manager or its authorized representative(s).
- .2 «The Contractor» designates the selected society chosen to execute all the repair works listed in the present document, in accordance with the norms, specifications and drawings submitted.

2. INTERPRETATION

- .1 All words, expressions, and abbreviations bearing a recognised professional or technical significance must be understood as such in these specifications and drawings.
- .2 The dimensions indicated on the drawings or spans, or represented by a module or lines, arrows, or otherwise, must have priority over the drawings.
- .3 The priority is given to the largest scale drawings. And as well the applicable specifications and drawings always are the most recent ones.
- .4 If there is a discrepancy between the numeric dimensions listed on the drawings, you must refer to the Engineer to find out the applicable dimensions.
- .5 All inconsistencies between the specifications and the drawings must be submitted in writing to the Engineer, in order for him to render, also in written form, a final ruling on the said inconsistencies.
- .6 The specifications and drawings complement each other, which means that the requirements described for one also apply to the other. The work to be done, in conformity with the specifications and drawings, must constitute a complete work in its parts and parcels and therefore include, among others, all the articles usually applicable in regard to the requirements of the specifications and drawings, whether or not they are fully and specifically listed. The Contractor must not profit, at the expense of Parks Canada, of any manifestly involuntary mistake or omission that may be detected. When the quality specification of the work or materials is not specified, the concerned body of work must supply the best available quality.
- .7 Solely for the purposes of clarity, the Engineer may supply additional drawings to the Contractor in order to ensure a satisfactory completion of the work. These drawings will bear the same significance and implication as those listed in the contract documents.

3. WORK DESCRIPTION

.1 Structural repair works

- .1 Injections cracks in the concrete wall.
- .2 Repair of the cavities in the concrete surface.
- .3 Sandblast the existing lead paint and paint the existing steel structure. Dispose of lead paint residues at an authorized site.
- .4 Demolition of the roof the existing steel and dispose of demolition materials in a permitted outside of the owner's limit site.
- .5 Barricade with veneer the existing openings.

.2 Architectural works

- .1 Supplies and install the new roofing.
- .2 Supplies and install a new access and garage door.

4. CONSTRUCTION SCHEDULE

- .1 Work expeditiously and complete the repair works (30) business days following the notice of adjudication by the Department.
- .2 The tendered to whom the Department intends to adjudicate the contract will have to submit, (5) day after receiving the adjudication letter, a schedule indicating the various progresses of work stages and the completion date.
- .3 According to the construction schedule and in a format acceptable by the Engineer, submit, within ten (10) business days following the adjudication of the contract, the delivery dates of the shop drawings, cutting bills and samples.
- .4 At the discretion of the Engineer, revisions on the progress of work, in regard of the implementation schedule submitted, will be made. The Contractor, with the collaboration and approval of the Engineer, will update the schedule

5. SCREENING OF THE SITE

- .1 In order to make project conditions familiar and to obtain all relevant information to ensure contract fulfilment, screen the work sites. Ignorance of site conditions cannot constitute, under any circumstances, a justifiable cause to demand a payment.
- .2 If the Department requires a certificate of survey, the date and time of the survey will be communicated in the call for tender's documents.

6. METHOD OF PAYMENT

- .1 All charges initiated to complete the work related to the present contract will be paid in accordance to the bidding form.
- .2 The Contractor must allocate the costs of his bid, in accordance with the Engineer's instructions.

7. DEFINITION OF UNIT PRICES

- .1 Unit prices for a specific work must therefore set off all work, expenses, payments, direct or indirect costs, gains and all liabilities, duties, actions, facts, inactions or mistakes attributable to the Contractor for this work.
- .2 Ensuing, the Contractor will supply, for that same unit price, the materials, workmanship, tools and necessary attachments to execute the works.
- .3 The unit price also includes transportation and implementation of the materials, as well as all general overhead, administration expenses, insurance premiums, dues, interest costs, rental charges taxes and other incidental expenses.
- .4 He must incorporate losses and damages that may occur due to the nature of the works, the variation of prices and salaries, the inherent business risks, strikes, delays not attributable to the Department, accidents, natural forces occurrences and any other fortuitous event.
- .5 All the charges resulting from the requirements of division 1 of the book of specifications will be paid according to the « Site organization » article of the quotation.

8. STAKING OF THE SITE

- .1 On the basis of the lines and inspection levels indicated on the building plans, establish the main butts and bounds needed to execute the works and supply all required equipment.
- .2 Take appropriate actions to avoid the displacement of the butts and bounds during the course of the works.
- .3 Supply all the required equipment to allow the Engineer to proceed with the appropriate verifications.

9. PERMITS, ORDERS AND REGULATIONS

- .1 The Contractor must obtain the required permits allowing the execution of the works. He will be subjected to all provincial and federal regulations and to any other law article or regulation pertaining to the present works. He takes full responsibility for any infringement of the applicable laws and regulations.
- .2 The Contractor is responsible (at its own expense) for all the safety precautions duties listed in the Quebec Act Respecting Occupational Health and Safety and to any charges inherent to these duties.

10. CODES AND STANDARDS

- .1 Unless otherwise indicated, executes the works in accordance with the National Building Code of Canada (NBC) and any other provincial or local code. In the case of inactions or contradictions between the standards, the most stringent requirements apply.
- .2 The works must conform to or exceed the requirements of the standards, codes and any other document reference information

11. NATIONAL PARKS ACT

- .1 Execute all the works to be performed within the limits of the National Parks Act, National Historic Parks or Historic Canals, in accordance with the provisions of the National Parks Act.

12. RELICS AND ANTIQUITIES

- .1 Advise the Engineer or if he is absent, advise the archaeologist or his representing of all your archaeology discoveries (of relics of construction a development for an object and also a piece of object) made on the site.

13. SURROUNDING USES BY THE CONTRACTOR

- .1 For the execution of the works and storage, limit the surrounding uses to the areas determined by the Engineer.
- .2 Do not unduly accumulate materials or equipment in order to avoid congestion of the premises.
- .3 Move stored materials or equipment that restrains the works of the Engineer or another contractor.

- .4 During the course of the works, do not use the work site as a temporary residence or lodging for the Contractor's employees.
- .5 After the necessary clearances have been secured, bear the costs for the use of storage areas or additional and necessary works needed to execute the work.
- .6 The Work shop no. 1 and 2 cannot be used by the contractor.

14. EXISTING SYSTEMS (NETWORKS)

- .1 When the work implies connections to existing systems, perform the works at the time prescribed by the authorities, limiting as much as possible restraints to pedestrian and vehicle circulation.
- .2 Prior to the beginning of the works, determine the location and extent of public utilities underground network and notify the Engineer of the findings.
- .3 Submit the work schedule to the Engineer and obtain his authorization regarding the temporary interruption of existing services or networks.
- .4 If previously undetected facilities are discovered during the course of the works, immediately notifies the Engineer and submits a written report of the findings to his attention.
- .5 Within a 2 m radiuses of the works, remove all abandoned public utilities networks. Using a plug or any other sealing device and in accordance with the Engineer's instructions, fill the piping at the cutting points.
- .6 Keep a record of the location of in-use, re-routed or abandoned public utilities underground networks.
- .7 Repair any network break caused by the present works.

15. DRILLING, ADJUSTING AND SEALING

- .1 Perform necessary drilling (including excavation works), adjusting and sealing works to allow precise and gap free connections between work elements that must be connected together.
- .2 When the new work is connected to existing work and the latter is modified, perform necessary drilling, sealing and restoration works in order for the new

work to adapt to the existing work.

- .3 Obtain the Engineer's authorization before drilling or installing a sleeve in a load-bearing element.
- .4 Perform drilling to obtain clean and plain headers and ensure that the sealing joint is as concealed as possible.
- .5 Perform vacuum seals between the works and the pipes, sleeves, piping and ducts (conduits).

16. CONCEALED WORKS

- .1 Unless otherwise indicated, conceals pipes, ducts and wiring in the floor, the walls and the ceilings of finished areas.

17. LOCATION OF EQUIPMENT, SANITARY AND LIGHTING FIXTURES

- .1 The location of equipment, sanitary and lighting fixtures, whether indicated or prescribed, must be considered as approximately.
- .2 Install the equipment, sanitary and lighting fixtures and distribution network elements in order to limit congestion and maintain optimal usable floor area, in accordance with the manufacturer's recommendations in regards to safety, free access and maintenance.
- .3 Notify the Engineer about the upcoming installation date and obtain his authorization for the designated location.
- .4 At the Engineer's request, submit block plans indicating the approximate location of the various services and equipment components.

18. JOB MEETINGS

- .1 Attend to the job meetings.
- .2 The Engineer will set up meetings and will arrange the time as well as prepare and issue a report.

19. REQUESTED DOCUMENTS ON THE JOB SITE

- .1 Keep on the site, one (1) example of each documents as follow:
 - .1 Drawings, book of specifications and contract addendums.

- .2 Additional notes and drawings.
- .3 Approved shop drawings.
- .4 Authorizations notices for alterations.
- .5 Test reports on the work and the materials.
- .6 Approved construction schedule.
- .7 Layout, installation and commissioning instructions supplied by the manufacturer.

20. BORINGS

- .1 Surveys and borings have been performed both for the design and the execution of the work. The contractor is aware that the interpretation of these surveys and borings cannot be guaranteed. The Contractor may decide to continue the investigations, provided he performs them without any damages.

21. RE-ESTABLISHING OF PROJECT SITE

- .1 Re-establish project sites to its original appearance.

Explanation of prices charged to the bill of quantity

The work under this Agreement and include the rehabilitation of the building no.3 Phase 1 will be measured for payment as follows:

1. Item 1 - Restauration of building no.3 – CIVIL WORKS

.1 POST 1.1 – MOBILIZATION

- .1 The item 1.1 of the Bill of quantities is a fixed lump sum amount to compensate all necessary expenses incurred in the execution of the works as well as any other expenses not included in the other Bid Form items, in accordance with the requirements of the specifications.
- .2 The amount includes, but is not limited to, the following:
 - .1 Transportation to the construction sites.
 - .2 Mobilization and demobilization of all labor, equipment and materials required to perform all work under this Agreement.
 - .3 If necessary, snow removal, ice control and control of water infiltration in all areas of work.
 - .4 If not included in other items, supply, installation, maintenance and removal of heated enclosures and other special measures for cast in cold weather.
 - .5 Protection against damage to buildings or structures and equipment Owner located near work.
 - .6 All security measures.
 - .7 Maintenance, cleaning and restoration of the site and of the disposal area.
 - .10 All other works mentioned in the specifications and shown in the drawings and not included in other payment stations.
 - .11 Means of communication with the Owner.
 - .12 The provision of all contractual documents required in the specifications, including the schedule:
 - .1 Submission of a calendar consistent with the quotation requirements.
 - .2 Continuous updating of the project schedule every 2 weeks. Any failure to submit the calendar and time updates result in the withholding of payments until receipt of the said schedule.

- .13 The supply, installation, maintenance and removal of temporary services to the construction site for the Contractor needs.
 - .14 Providing all fences, crash barriers (Jersey) and other security measures to protect work sites, workers, materials and equipment.
 - .15 All other work to repair the building no. 3 mentioned in the quote, shown in the drawings that are not allocated to any of the other items of the Bid Form.
 - .16 Any installation and service required for the site, such as site offices, project meetings, management and disposal of construction and demolition waste, paths, platforms, walkways, sanitation , construction fences, electric power, water and construction lighting, furniture, telephone and related services (internet, pagers, fax, etc.), heating and ventilation construction office and warehouse, scaffolding, construction panels and maintenance in accordance with the requirements of quotes and according to the supervisor's directions of work
 - .17 The required coordination with the City of Montreal and other stakeholders, including obtaining all permits required to carry out the work.
 - .18 Maintenance of the site and its access.
 - .19 Survey costs, picket books and records charges that are not allocated to any of the other items of the Bid Form.
 - .20 Construction site guarding fees (if required).
 - .21 If required, field rental fees and / or space for storage of materials.
 - .22 Protecting existing public utilities in areas of work during construction. When required, this protection includes the removal and reinstallation of street lights, ducts and underground cables for street lights and street lights foundation blocks. If the Contractor damages these facilities for its work, it must replace at its own expense.
- .3 Fixed amount stated in the tender for this item will be paid in proportion to the progress of work.

POST 1.2 - CONCRETE REPAIR

- .1 The price for the payment item 1.2 in the bill of quantities for concrete repair as shown in S100 to S103 structural drawings will be measured for payment per cubic meter (m³) of concrete poured in place.
- .2 The amount includes, but is not limited to, the following:
 - .1 All materials and labor for all other work related to the reconstruction of concrete and surfaces including, but not limited to, preparation of shop drawings, management of waste, the son fastening, the implementation and any incidental expense to do the work according to the specifications and drawings.
 - .2 The preparation and cleaning of concrete surfaces.
 - .3 Supply, forming and installation of reinforcing steel and reinforcing steel anchors, including all hardware and the adhesive resin.
 - .4 Roughening of concrete surfaces.
 - .5 The supply, installation of the bonding agent.
 - .6 Supply, installation and removal of the formwork.
 - .7 The establishment of the elements embedded in the concrete, such as galvanized C200x17.
 - .8 Supply and installation of new concrete Hilti anchors including all the galvanized hardware relating thereto.
 - .9 The supply and installation of galvanized rebars.
 - .10 The supply and installation of the concrete. Finishing and curing of concrete as indicated in the quote.
 - .11 All concrete grinding work so as to be within the guidelines of the Engineer.
 - .12 All work of local surface repairs, as appropriate.
 - .13 If necessary, grout required for leveling and corrections.
 - .14 The provision of all equipment required to perform the work in accordance with drawings, specifications and the guidelines of the Engineer.
 - .15 Platforms and heated shelter to complete the work according to the drawings, the drawings and specifications of the Engineer.

- .3 The amount stated in the tender for this position will be paid after the approval of the work by the number of cubic meter (m³) of concrete cast in place effectively

POST 1.3- REPAIR OF BEES NEST AND DELAMINATED WALL

- .1 The price for the payment item 1.3 in the bill of quantities for concrete repair as shown in S100 to S103 of the structural drawings shall be measured per square meter payment purposes (m²) repair performed and accepted by the engineer .
- .2 The price tendered for this item should include, but not limited to, the following:
- .1 All materials and labor for all other work related to concrete repair and surfaces including, but not limited to, preparation of shop drawings, management of waste, fastening, the implementation and any incidental expense to do the work according to the specifications and drawings.
 - .2 The preparation and cleaning of concrete surfaces.
 - .3 Roughening of concrete surfaces.
 - .4 Saw cuts.
 - .5 The supply, installation of the bonding agent.
 - .6 Supply, installation and removal of the formwork.
 - .7 Sandblasting the existing armature.
 - .8 Supply and installation of new concrete Hilti anchors including all the galvanized hardware relating thereto.
 - .9 The supply and installation of galvanized rebars.
 - .10 The supply and installation of the concrete. Finishing and curing of concrete as indicated in the quote.
 - .11 All concrete grinding work so as to be within the guidelines of the Engineer.
 - .12 All local surface repairs, as appropriate.
 - .13 If necessary, grout required for leveling and corrections.
 - .14 The provision of all equipment required to perform the work in accordance with drawings, specifications and the guidelines of the Engineer.
 - .15 Platforms and heated shelter to complete the work according to the drawings, the drawings and specifications of the Engineer.
- .3 The amount stated in the tender for this position will be paid per square meter (m²) effective compensation after the approval of the work.

POST 1.4.1 – CRACKS REPAIR

- .1 The price for the payment item 1.4.1 in the bill of quantities for crack repair as shown in S100 to S103 structural drawings will be measured for payment to the linear meter crack repair (m.l.), according to the estimate, drawings and instructions of the Engineer.

- .2 The price tendered for this position should include, but not limited to, the following:
 - .1 Transportation to the site and those outside it.
 - .2 Mobilization and demobilization of all labor, equipment and materials required to perform all work under this Agreement.
 - .3 Cleaning the surface of the wall injection
 - .4 Preparation of the surface cracks
 - .5 Cleaning the deep fissures;
 - .6 Powerful cleaning and rinsing the surface cracks;
 - .7 Supply and installation of the support material for the surface sealing of cracks if any, and preliminary tests;
 - .8 The equipment and installation of sealant
 - .9 Boreholes for injection tubes and manpower required to run
 - .10 The supply and installation of injection sleeves
 - .11 Leveling sleeves at the end of work
 - .12 All other work required to complete the injection work in accordance with drawings, specifications and the guidelines of the Engineer.

- .3 The amount of actually repaired crack will be measured by the Engineer to the number of linear meters (m.l.) cracks repaired and will be paid after the work.

POST 1.4.2 - INJECTION MATERIAL

- .1 Provision of injection material will be measured by the liter (l) for payment purposes; will be taken into account the number of liters of material injected and actually provided to seal cracks according to

- the specifications, the structural drawings S100 to S103 and instructions of the Engineer.
- .2 The price tendered for this position should include, but not limited to, the following:
 - .1 Injecting the resin, including equipment, labor, monitoring and quality control.
 - .3 The amount of actually supplied and injected injection material to seal cracks will be measured by the Engineer to the number of liters (l) used for sealing the crack. The Contractor shall verify and confirm these dimensions at the same time that the inspector. The amount for this position will be paid at the end of crack injection work.
 - .1 If the Contractor does not agree to these amounts, it must give in writing immediately to the Engineer the reasons for his disagreement and provide appropriate justification.
 - .2 Use the quantity specified in the bid form for the amount of this item.

POST 1.5 - PAINTWORK

- .1 The price for the post of payment 1.5 in the bills of quantities for the painting as shown in S100 to S103 structure plans will be measured for payment on the basis of a fixed amount, as the specifications, drawings and instructions of the Engineer.
- .2 The price tendered for this position should include, but not limited to, the following:
 - .1 Transportation to the site.
 - .2 Mobilization and demobilization of all labor, equipment and materials required to perform all work under this item.
 - .3 Sandblasting of all steel frames.
 - .4 Disposal of the paintings residues containing lead out of the owner site.
 - .5 Supply and application of the paint system.
 - .6 Powerful washing up and cleaning the steel surface.
 - .7 Heating, ventilation and humidity control inside the enclosures.

- .3 Fixed amount stated in the tender for this position will be paid in proportion to the progress of work.

2 **Item 2 - Restauration of building no.3 – ARCHITECTURE**

ITEM 2.1. – OBSTRUCTION OF THE OPENINGS

- .1 The price for item 2.1 in the tender slip, concerning obstruction of the openings as shown in architectural plans from CL-03-169-05 to CL-03-169-10 will be measured on a lump sum basis
- .2 The bid price for this item should include the following, without limitations:
 - .1 Dismantling and disposal of existing opening enclosure out of landlord's space.
 - .2 Provision, shaping and installation of new wooden enclosures, including all required hardware, mechanical anchors and all galvanized hardware.
 - .3 Provision of all equipment required to perform the work in accordance with drawings, specifications and the architect's guidelines.
 - .4 Preparing and cleaning surfaces.
 - .5 All materials and labor for all other work related to the construction of wooden frames and wooden surfaces including, but not limited to, preparation of shop drawings, trash management, attachment cables, Expenses related to the work according to the specifications and drawings.
- .3 The lump sum stated in the tender for this item will be paid in proportion to the progress of work.

ITEM 2.2 – NEW ROOFING INSTALLATION

- .1 The price for item 2.2 in the tender slip, concerning new roofing installation as shown in architectural plans from CL-03-169-05 to CL-03-169-10 will be measured on a lump sum basis

- .2 The bid price for this item should include the following, without limitations:
- .1 If necessary, snow removal, ice control and control of water infiltration in all areas of work.
 - .2 Provision and Installation of vapor barriers.
 - .3 Provision, shaping and installation of new wooden frames, including all required hardware, mechanical anchors and all galvanized hardware.
 - .4 The provision, shaping and installation of gypsum base panels for roofing, including all required hardware, and also installation of mechanical anchors.
 - .5 The provision, shaping and installation of roofing insulation panels, including all required hardware, and also installation of mechanical anchors.
 - .6 The provision, shaping and installation of metal cladding for roofing, including all required hardware, sealants, installing the anchors and metal fasteners for panels.
 - .7 Provision, shaping and finishing installation of soffits, including wooden slats, the anti-intrusion fence, paint, metal flashings, sealants and all required hardware.
 - .8 Equipment, labor and materials required to perform all work under this Agreement.
 - .9 All materials and labor for all other work related to the construction of the roof including, but not limited to, preparation of shop drawings, trash management, attachment cables, Expenses related to the work according to the specifications and drawings.
 - .10 The provision of equipment and manpower required for dismantling and disposing of the existing wooden roof.

- .3 The lump sum stated in the tender for this item will be paid in proportion to the progress of work.

ITEM 2.3 – INSTALLATION OF A NEW OVERHEAD DOOR

- .1 The price for item 2.3 in the tender slip, concerning installation of a new overhead door as shown in architectural plans from CL-03-169-05 to CL-03-169-10 will be measured on a lump sum basis
- .2 The bid price for this item should include the following, without limitations:
 - .1 Supply and installation of metal support of the door and fasteners to the structure. Including all required hardware, installing mechanical anchors and all the relating galvanized hardware.
 - .2 Supply and installation of door panels, including panels, assembly sections of the panels, the pedestrian door, all thermal sealing accessories and required hardware.
 - .3 Supply and installation of mechanical opening device of the door, including all required hardware.
 - .4 Supply and installation of equipment for manual door opening, including all required hardware.
 - .5 Supply and installation of electrical power for the mechanical opening device of the door.
 - .6 Supply and installation of a door threshold if specified by the customer.
 - .7 Equipment, labor and materials required to perform all work under this Agreement.
 - .8 All materials and labor for all other work related to the construction of the overhead door including, but not limited to, preparation of shop drawings, trash management, attachment cables, Expenses related to

the work according to the specifications and drawings.

- .3 The lump sum stated in the tender for this item will be paid in proportion to the progress of work.

ITEM 2.4 – INSTALLATION OF A PEDESTRIAN DOOR

- .1 The price for item 2.4 in the tender slip, concerning installation of a new pedestrian door as shown in architectural plans from CL-03-169-05 to CL-03-169-10 will be measured on a lump sum basis
- .2 The bid price for this item should include the following, without limitations:
 - .1 Supply and installation of door frame, including machining, painting, fasteners, sealants, insulation and shims.
 - .2 Supply and installation of door, including machining, painting and all required hardware.
 - .3 Supply and installation of all required door hardware.
 - .4 Equipment, labor and materials required to perform all work under this Agreement.
 - .5 All materials and labor for all other work related to the construction of the pedestrian door including, but not limited to, preparation of shop drawings, trash management, attachment cables, Expenses related to the work according to the specifications and drawings.
- .3 The lump sum stated in the tender for this item will be paid in proportion to the progress of work.

.3 Item 3- Restauration of building no.3 – Provision for Winter Conditions, Cold Weather Concreting

Item 3.1 – Temporary Shelter for Concrete Pouring

- .1 The line item 3.1 of the Bid Form is a price per square meter (m²) of shelter surface based on the concrete surface to be protected, in accordance

with the requirements of the specifications and drawings and as directed by the Consultant.

- .2 The amount includes, but is not limited to, the following:
 - .1 Preparation, presentation, and correction, if required, to the description of the shelter.
 - .2 The mobilization of labour, tools, and equipment required to carry out the work;
 - .3 Supply, handling, and transport of materials needed to build the shelter;
 - .4 Installation, maintenance during construction, and dismantling of the temporary shelter upon completion of the work;
 - .5 Transport off-site of the materials;
Any incidental expenses.
- .3 The temporary shelter is payable only if it is required, in writing, by the Consultant. The bid price is paid as follows:
 - .1 60% of the amount after the installation of the shelter to the satisfaction of the Consultant;
 - .2 40% of the amount after the off-site disposal of the shelter's materials.

ITEM 3.2 – HEATING OF CONCRETE COMPONENTS

- .1 The line item 3.2 of the Bid Form is a price per cubic meter (m³) of placed concrete or cementitious grout whose components are heated, in accordance with the requirements of the specifications and as directed by the Consultant.
- .2 The amount includes, but is not limited to, the following:
 - .1 Heating the mixing water (between 40 and 80 °C) used for making the concrete;
 - .2 Heating the aggregates to remove frozen pieces, snow, and ice;
 - .3 Any incidental expenses.
- .3 The heating of the concrete constituents is payable only if requested in writing by the supervisor of the work. The bid price is paid at the end of the work.
 - .1 Costs for heating of concrete or non-shrink grout components required following the correction of defective work shall be borne by the Contractor.

END OF SECTION

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- .1 Shop drawings and product data
- .2 Samples
- .3 Operating and maintenance manuals
- .4 Record drawings
- .5 Certificates and transcripts

1.2 ADMINISTRATIVE

- .1 Submit to Architect submittals listed for review. Submit with reasonable promptness and in an orderly sequence so as to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed. Allow ten (10) working days for review of submittals.
- .2 Work affected by the submittal shall not proceed until review is complete.
- .3 Review submittals prior to submission to the Architect. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of the Work and the Contract Documents. Submittals not stamped, signed, dated and identified as to the specific project will be returned without being examined and shall be considered rejected.
- .4 Verify field measurements and affected adjacent Work are coordinated.
- .5 Contractor's responsibility for errors and omissions in submission is not relieved by Architect's review of submittals.
- .6 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Architect's review.
- .7 Keep one reviewed copy of each submission on site.

1.3 REFERENCES

- .1 The abbreviations used in this specification corresponds to the following list:

ACI

American Concrete Institute (USA)

CSA	Canadian Standards Association
TTMAC	Terrazzo, Tile and Marble Association of Canada
ASA	American Standard Association
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers Inc. (USA)
ASME	American Society of Mechanical Engineers (USA)
ASTM	American Society for Testing and Materials (USA)
AWI	Architectural Woodwork Institute (USA)
CEMA	Canadian Electrical Manufacturers Association
NBC	National Building Code of Canada
FCC	Fire Commissioner of Canada
IBR	Institute of Boiler and Radiator Manufacturers (USA)
CGSB	Canadian General Standards Board
ULC	Underwriters Laboratories of Canada

1.4 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of the Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of the Section under which the adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

Submissions shall include:

- .1 Date of submission of original documents and revision dates.
- .2 Project title and number.
- .3 Name of:
 - General Contractor
 - Subcontractor.
 - Supplier.
 - Manufacturer.
 - Distributor, where applicable.
- .4 Product identification.
- .5 Relationship to adjacent work.
- .6 Field dimensions, identified as such.
- .7 Specification Section number.

- .8 Applicable standards, ie. CSA or CGSB and their number.
- .9 Contractor's stamp, signed by Contractors authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract documents.

- .3 Adjustments made on shop drawings by the Architect are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Architect prior to proceeding with the Work.

- .4 Make changes in shop drawings as the Architect may require, consistent with Contract Documents. When resubmitting, notify the Architect in writing of any revisions other than those requested.

- .5 Submit six (6) prints of shop drawings and one (1) reproductive copy for each requirement requested in specification Sections and as the Architect may reasonably request.

- .6 Submit six (6) copies of product data sheets or brochures for requirements requested in specification Sections and as the Architect may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.

Above documentation will not be accepted if not in accordance with the following:

- .1 shall not contain information irrelevant to the Work;
- .2 basic information must be completed by additional information relating to the Work;
- .3 must indicate dimensions and required clearances;
- .4 must state performance characteristics and capacities;
- .5 must illustrate wiring diagrams and, if applicable, controls.

- .7 If upon review by the Architect, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed.

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

1.5 EQUIVALENCE AND SUBSTITUTIONS

- .1 The following requirements are to establish a certain level of quality for the

materials and services furnished for the Work and to eliminate the practice of bargaining for new alternatives once the Contract has been awarded, which would be to the detriment of the Owner.

- .2 Moreover, the desired goal is not to eliminate honest competition in tendering applied to substitute materials and products.
- .3 Contractors must submit a tender price based on specified equipment, fixtures and materials. He must also indicate the name of the products he intends to use.
- .4 If Contractor desires to use materials he considers EQUIVALENT to those described by a product name, he must submit a request with his bid, indicating the difference in price if such substitution was accepted.
- .5 Requests for substitution will not necessarily be processed before the Contract is awarded and, in consequence, the sub-contractor shall have thirty (30) days after contract award to submit proof of equivalence.
- .6 All materials or products proposed as equivalent will be considered NON EQUIVALENT until a certificate of equivalence has been issued by the Architect.
- .7 No request for substitution shall be processed if it is received after tender closing date, except if such material or product became unavailable. Consequently, no substitution will be considered after the Contract is signed except for major reasons.
- .8 In brief, requests for substitution will be received and analyzed in the thirty (30) days following Contract award on the condition such requests were previously submitted in the Tender form or that the requests for substitution result from major reasons such as strikes, fires, etc. impeding the delivery of specified equipment within acceptable delays.
- .9 Requests for substitution, and all proof of equivalence that the Architect might require, must be submitted in four (4) copies. Proof of equivalence shall be based on the principal points of comparison such as construction, capacity, dimensions, weight, clearances, minimal standards, replacement parts, maintenance considerations, delivery dates and the existence of similar and proven equipment.
- .10 The Architect may accept or refuse requests for substitution and his decision is final.

- .11 Additional costs brought about by a substitution accepted by the architect will be to the concerned sub-contractor's expense.
- .12 If a sub-contractor makes a substitution without prior approval, he automatically incurs the risk of having the substituted materials replaced at his expense.

1.6 SAMPLES

- .1 Submit for review samples in triplicate as requested in respective specification Sections unless indicated otherwise. Label samples as to origin and intended use in the Work.
- .2 Deliver samples prepaid to Architect's business address.
- .3 Notify the Architect in writing, at the time of submission of deviations in samples from requirements of Contract Documents.
- .4 Adjustments made on samples by the Architect are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Architect prior to proceeding with the Work.
- .5 Make changes in samples which the Architect may require, consistent with Contract Documents.

1.7 OPERATING AND MAINTENANCE MANUALS

- .1 Two (2) weeks prior to Substantial Performance of the Work, submit to the Consultant, three (3) copies of operating and maintenance manuals.
- .2 Manuals to contain operational information on equipment, cleaning and lubrication schedules, filters, overhaul and adjustment schedules and similar maintenance information. Instructions in this manual shall be in simple language so as to guide the Owner in the proper operation and maintenance of building components.
- .3 Bind contents in a three-ring, hard covered, plastic jacketed binder. Organize contents into applicable categories of work, parallel to specifications Sections.
- .4 In addition to information specified, include the following:

- .1 Title sheet, labelled "Operating and Maintenance Instructions", containing project name and date.
- .2 List of names, addresses and phone numbers of subcontractors and suppliers who can affect repair or maintenance on equipment.
- .3 List of contents.
- .4 Final shop drawings and product data of equipment.
- .5 Record drawings of mechanical and electrical installation.
- .6 Full description of building systems and operation.
- .7 Maintenance instructions for visible surfaces and finished materials.
- .8 Warranties, insurance policies and bonds indicating:
 - project name and address;
 - date that warranties take effect (the date final certificate of completion is issued);
 - warranty period;
 - a precise and clear indication of the nature of the warranty and the measures that are to be taken to remedy defects to the guaranteed Work;
 - Contractor's signature and stamp.
- .9 Indicate manufacturer's name and origin of materials used in the Work.

.5 All documents submitted are to be written in French and English.

1.8 RECORD DRAWINGS

- .1 After award of Contract the construction manager will provide a set of drawings for the purpose of maintaining record drawings. Accurately and neatly record deviations from Contract Documents caused by site conditions and changes ordered by the professionals.
- .2 Record locations of concealed components of mechanical and electrical services.
- .3 Identify drawings as "Project Record Copy". Maintain in new condition and make available for inspection on site by the professionals.
- .4 On completion of Work and prior to final inspection, submit record documents to the construction manager.

1. GENERAL

- .1 This section specifies general requirements and procedures for contractors submissions of shop drawings, product data, samples and mock- ups to Engineer for review. Additional specific requirements for submissions are specified in individual sections of Divisions 2 to 16.
- .2 Do not proceed with work until relevant submissions are reviewed by Engineer.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values is acceptable.
- .5 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer's review of submissions.
- .6 Notify Engineers, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer's review of submission, unless Engineer gives written acceptance of specific deviations.
- .8 Make any changes in submissions which Engineer may require consistent with Contract Documents and resubmit as directed by Engineer.
- .9 Notify Engineers, in writing, when resubmitting, of any revisions other than those requested by Engineer.

2. SUBMISSION REQUIREMENTS

- .1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .2 Allow 7 days for Engineers review of each submission.
- .3 Accompany submissions with transmittal letter, in 2 duplicates, containing:
 - .1 Date;
 - .2 Project title and number;

- .3 Contractor's name and address;
- .4 Identification and quantity of each shop Drawing, product data and sample;
- .5 Other pertinent data.
- .4 Submissions shall include:
 - .1 Date and revision dates;
 - .2 Project title and number;
 - .3 Name and address of:
 - .1 Subcontractor;
 - .2 Supplier;
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractors authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents;
 - .5 An engineer's signature and seal known in Canada.
 - .6 Details of appropriate portions of Work as applicable:
 - .1 Fabrication;
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances;
 - .3 Setting or erection details;
 - .4 Capacities;
 - .5 Performance characteristics;
 - .6 Standards;
 - .7 Operating weight;

- .8 Wiring diagrams;
 - .9 Single line and schematic diagrams;
 - .10 Relationship to adjacent work.
 - .5 After Engineer's review, distribute copies.
3. SHOP DRAWINGS
- .1 Shop drawings: original drawings, or modified standard drawings provided by Contractor, to illustrate details of portions of Work, which are specific to project requirements.
 - .2 Maximum sheet size : 1000 x 707 mm.
 - .3 Submit shop drawings as follows:
 - .1 Opaque diazo prints: number Contractor requires for distribution plus 10 copies which will be retained by Engineer.
 - .4 Cross-reference shop drawing information to applicable portions of Contract documents.
4. PRODUCT DATA
- .1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
 - .2 Submit 6 copies of product data.
 - .3 Sheet size: 215 x 280 mm, maximum of 3 modules.
 - .4 Delete information not applicable to project.
 - .5 Supplement standard information to provide details applicable to project.
 - .6 Cross-reference product data information to applicable portions of Contract Documents.
5. SAMPLES

- .1 Samples: examples of materials, equipment, quality, finishes, workmanship.
- .2 Where color, pattern or texture is criterion, submit full range of samples.
- .3 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

6. MOCK-UPS

- .1 Mock-ups: field-erected example of work complete with specified materials and workmanship.
- .2 Erect mock-ups at locations acceptable to Engineer.
- .3 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be verified.

7. SHOP DRAWINGS REVIEW

- .1 The Governmental Services of Canada and the Public labors goal in reviewing the shop drawings, is to assure that they are in accordance with the general concept. This does not imply that Public labors Canada approves the detailed conception of the drawings. The contractor remains liable throughout the development of the project, as well as submitting all information required. Even during a review the contractor is liable for all errors and omissions on the concerned drawings or obliged to observe the construction and contractual documents. Without limiting the preceding general information, the contractor must be on site, to observe the manufacturing process or the technical construction and the installation as well as the subcontractor's progress.

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 41 99 – DEMOLITION

1.2 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada, Workplace Hazardous Materials Information System (WHMIS)
- .3 Province of Quebec
 - .1 Loi sur la santé et la sécurité du travail, L.R.Q., c. S-2.1- updated 2014.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
 - .3 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to authority having jurisdiction, weekly, as well as to the Consultant.
 - .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
 - .5 Submit copies of incident and accident reports.
 - .6 Submit the WHMIS material safety data sheets (MSDS).
 - .7 The Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 5 days after receipt of comments from the Consultant.
 - .8 The Consultant's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
 - .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to the Consultant.
 - .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

- .1 File Notice of Project with Provincial Territorial authorities prior to beginning of Work.

1.5 SAFETY ASSESSMENT

- .1 Conduct an assessment of the risks and safety hazards present on the site in relation to the works to be performed.
- .2 It is the responsibility of the Contractor to conduct audits to ensure the safety of the work done near the Lachine Canal Walls. These checks are needed to avoid the risks of instability or collapse of the walls.

1.6 MEETINGS

- .1 Schedule and administer Health and Safety meetings with the Consultant prior to commencement of Work.
- .2 Notify the Consultant at least five (5) days before this meeting.

1.7 REGULATORY REQUIREMENTS

- .1 Perform the Works in accordance with the requirements of the authorities have jurisdiction in the City of Montreal territory.

1.8 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 The Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local

statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

- .3 By accepting this contract, the Contractor supports all the responsibilities normally assigned to the Project Manager, under the law on health and safety. Before starting work, carry out the following activities:
 - .1 To provide the Engineer the work planning and a mechanical inspection certificate for each piece of machinery used in construction.
 - .2 Ensure that site workers have received training and information needed to perform the work safely and that all required tools and protective equipment is available, consistent with the standards, laws and regulations .
 - .3 Comply at all times the provisions of the Occupational Health and Safety Act and the Safety Code for the construction work.
 - .4 Advise your employees that they have the right to refuse any work involving a risk to their health or safety.
 - .5 Delimit and barricade your work area and control access.
 - .6 In the event of an unforeseen incident, take all necessary steps, including stopping work, to protect the health and safety of workers and the public, and immediately contact the Supervisor of the work.
- .4 Perform the work so as to allow the continued use of the premises by the public. Maintain access to public places until an alternative was not developed when the state is an impediment to the free movement of users in places.

1.10 COMPLIANCE REQUIREMENTS

- .1 Comply with the health and safety regulations, Loi sur la santé et la sécurité du travail, Règlement sur les établissements industriels et commerciaux, R.R.Q.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occurs during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province having jurisdiction and notify the Consultant verbally and in writing.

1.12 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Possess practical construction site experience involving activities associated

- with concrete repair, electrical works, and paving works.
- .2 Have working knowledge of occupational safety and health regulations. Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .4 Be on site during execution of Work and report directly to and the Consultant following his instructions.

1.13 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province Territory having jurisdiction, and in consultation with the Consultant.

1.14 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by the Consultant.
- .2 Provide Consultant with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.15 BLASTING

- .1 Blasting and other use of explosives are not allowed.

1.16 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from the Consultant.

1.17 WORK STOPPAGE

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

END OF SECTION

1. RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- .1 Particular requirements for inspection and testing to be carried out by testing Laboratory designated by Engineer are specified under various sections.

2. APPOINTMENT AND PAYMENT

- .1 Engineer will appoint and pay for services of testing laboratory except for the following:
- .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities;
 - .2 Inspection and testing performed exclusively for Contractor's convenience;
 - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems;
 - .4 Mill tests and certificates of compliance;
 - .5 Tests specified to be carried out by Contractor under the supervision of Engineer;
 - .6 Additional tests specified in paragraph 2.2.
- .2 Where tests or inspections by designated testing laboratory reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Engineer may require to verify acceptability of corrected work.

3. CONTRACTOR'S RESPONSIBILITIES

- .1 Furnish labor and facilities to:
- .1 Provide access to work to be inspected and tested;
 - .2 Facilitate inspections and tests;
 - .3 Make good work disturbed by inspection and test;

- .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify Engineer sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Engineer.

1. ACCESS

- .1 Provide and maintain adequate access to project site.
- .2 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
- .3 Clean runways and taxi areas where used by Contractor's equipment.

2. CONTRACTOR'S SITE OFFICE

- .1 Provide office heated to 22 °C, lighted 750 Lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing lay down table and telephone, pay telephone not acceptable.

3. SANITARY FACILITIES

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

4. SITE ENCLOSURES

- .1 The engineer will hand over the site key to the contractor which will make him the gate controller.

5. POWER

- .1 Maximum power supply of 5 kVA, at 120/208 V, 3 phases, 60 Hz is available and will be provided for construction use at [no cost] [current cost rates]. Connect to existing power supply in accordance with Canadian Electrical Code [and provide meters and switching].
- .2 Electrical power and lighting systems installed under this Contract may be used for construction requirements with prior approval of Engineer provided that guarantees are not affected. Make good damage. Replace lamps which have been used over period of 3 months.

6. WATER SUPPLY

- .1 Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances.

- .2 Water supply is available in existing building (on site) and will be provided for construction usage at no cost.
- .3 Permanent water supply system installed under this Contract may be used for construction requirements with prior approval of Engineer provided that guarantees are not affected. Make good damage.

9. DRAINAGE

- .1 Refer to Section 01561 – Environmental Protection for site drainage and pumping requirements.

10. SITE SIGNS AND NOTICES

- .1 Signs and notices for safety and instruction shall be in both official languages
Graphic symbols shall conform to CAN3-Z321-77.

11. REMOVAL OF TEMPORARY FACILITIES

- .1 Remove temporary facilities from site when directed by Engineer.
- .2 When project is closed down at end of construction season keep temporary facilities operational until close down or removal is approved by Engineer.

12. SCAFFOLDING

- .1 Construct and maintain scaffolding in rigid, secure and safe manner. Refer to ACNOR S269.101975 and section 01545.
- .2 Erect scaffolding independent of walls. Remove promptly when no longer required. Refer to Section 01545 - Safety Requirements for safety requirements for scaffolding.

1. CONSTRUCTION SAFETY MEASURES

- .1 Observe construction safety measures of National Building Code (1995) Part 8, Provincial Government, Workers'/Workmen's Compensation Board and municipal authority provided that in any case of conflict or discrepancy more stringent requirements shall apply.
- .2 Comply with requirements of FCC No. 30 1-Standard for Construction Operations, June 1982, issued by Fire Commissioner of Canada.

2. OVERLOADING

- .1 Ensure no part of Work is subjected to loading that will endanger its safety or will cause permanent deformation.

3. FALSEWORK

- .1 Design and construct false work in accordance with CSA S269.1-1975.

4. SCAFFOLDING

- .1 Design and construct scaffolding in accordance with CSA S269.2-M87.

1. FIRES

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

2. DISPOSAL OF WASTES

- .1 Do not bury rubbish and waste materials on site unless approved by Engineer.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

3. DRAINAGE

- .1 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

4. POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to local authority's emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1. GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within 7 days of written request by Engineer, submit following information for materials and equipment proposed for supply:
 - .1 Name and address of manufacturer;
 - .2 Trade name, model and catalogue number;
 - .3 Performance, descriptive and test data;
 - .4 Manufacturer's installation or application instructions;
 - .5 Evidence of arrangements to procure.
- .3 Furnish and install materials and construction equipment of high quality, in accordance with the established standards and for which replacement pieces are easy to obtain.
- .4 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.

2. MANUFACTURERS INSTRUCTIONS

- .1 Unless otherwise specified, complies with manufacturer's latest printed instructions for materials and installation methods.
- .2 Notify Engineer in writing of any conflict between these specifications and manufacturer's instructions. Engineer will designate which document is to be followed.

3. FASTENINGS - GENERAL

- .1 Provide metal fastenings and accessories in same texture, color and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work.
- .2 Obtain Engineer's approval before using explosive actuated fastening devices. If approval is obtained comply with CSA Z166-1975.

4. FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

5. DELIVERY AND STORAGE

- .1 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.
- .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
- .3 Store material and equipment in accordance with suppliers instructions.
- .4 Touch-up damaged factory finished surfaces to Engineer's satisfaction. Use primer or enamel to match original. Do not paint over name plates.

6. CONFORMANCE

- .1 When material or equipment is specified by standard or performance specifications, upon request of Engineer, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

7. SUBSTITUTION

- .1 Proposals for substitution may only be submitted after award of contract. Such request must include statements of respective costs of items originally specified and the proposed substitution.
- .2 Proposals will be considered by Engineer if:
 - .1 materials selected by tendered from those specified, are not available;

- .2 delivery date of materials selected from those materials specified would unduly delay completion of contract, or;
- .3 alternative materials to those specified which are brought to the attention of and considered by Engineer as equivalent to the material specified and will result in a credit to the Contract amount.
- .4 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.
- .5 Amounts of all credits arising from approval of substitutions will be determined by Engineer and Contract Price will be reduced accordingly to the saving made by the Contractor.

8. CONSTRUCTION EQUIPMENT AND PLANT

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

1 GENERAL

- .1 Perform cleaning and disposal tasks in accordance with local orders and environmental laws
- .2 Put volatile waste in covered metallic containers and remove them from the site on a daily basis.
- .3 Make provisions for adequate ventilation while using volatile or toxic substances.

2 CLEANING DURING CONSTRUCTION

- .1 Keep the job site clean and public facilities free of debris and waste.
- .2 Remove debris and waste from the job site.
- .3 Establish the cleaning schedule in order that dust and other dirt materials will not deposit on freshly painted surfaces.

3 FINAL CLEANING

- .1 When construction is almost completed, make a complete inspection of all indoor and outdoor visible surfaces.
- .2 Remove grease, dust, dirt, tags, smears and other foreign matters from visible indoor and outdoor finished surfaces, including glassworks and other polished surfaces.
- .3 Clean the reflectors, light diffusers and other lighting surfaces.
- .4 Sweep covered surfaces and rake the land.
- .5 Clear debris and surplus materials from the roofs and concealed open areas.
- .6 Remove snow and ice from the entrance routes of the building.

1. DRAWINGS TO INCLUDE IN THE PROJECT RECORDS

- .1 The Engineer will supply two (2) sets of positive drawings, to be included to the project records.
- .2 Keep the drawings and fully make note of every deviation from requirements of the contract documents, changes caused by site conditions and changes made by order of the Engineer.
- .3 Changes are to be noted in red.
- .4 Document the following information:
 - .1 depths of various foundation units with reference to the ground level;
 - .2 locations, both on vertical and horizontal planes, of underground service piping and related works with reference to the final ground surface;
 - .3 locations of concealed internal utilities networks and their outbuildings with reference to accessible and visible structural elements;
 - .4 on site alterations to dimensions and detail workings;
 - .5 changes made following requested alterations or on site orders.
- .5 After the works are completed and prior to final inspection, carefully transfer the alterations on the second set of drawings and submit both complete sets to the Engineer.

1. MAINTENANCE HANDBOOK

- .1 After the completion of the works, supply the Engineer with 4 copies of the field and maintenance data, both in French and English, respecting the following format:
 - .1 Report data on 215 X 280 mm (8½" X 11") loose leaves, in a 3 ring hard vinyl cover.-binder.
 - .2 On the title page, «Operational and Maintenance Handbook», write the installation name, the date and the table of contents.
 - .3 Separate the data in the appropriate sections, in conformity with the subdivisions of the book of specifications. Identify each section with a tagged binder's tab, covered in celluloid and attached to the cardboard separator.
- .2 Include the following information in addition to the required data:
 - .1 The maintenance instructions for finished materials and surfaces.
 - .2 A copy of the list of the hardware and the paint.
 - .3 The description, the operational and maintenance instructions for the equipment and the networks, including a complete list of all the parts and equipment. Supply the information of the identification plate, such as the brand, dimensions, capacity and serial number.
 - .4 The name, address and phone number of speciality contractors and suppliers.
 - .5 The various warranties and securities indicating:
 - .1 the name and address of the works;
 - .2 the effective date of the warranty (Issue date of the final Certificate of completion);
 - .3 the warranty period;
 - .4 the specifics object covered by the warranty and the corrective action it implies;
 - .5 The Contractor's signature and seal of office.

PART 1 - GENERAL

1.1 RELATED WORK

- .1 Restrictions on use of adjacent public and private roads, walks and property, including aerial space:
- .2 Restrictions on noise, dust, interference, obstructions, access and hours of work.
- .3 Safety barricades and lights.
- .4 Site conditions before beginning of Work.
- .5 Weather and dust barriers or partitions.

1.2 SCOPE OF WORK

- .1 Follow indications on Drawings and Specifications.
- .2 Work included in this Section includes the supply of all equipment, scaffolding, tools, bracing, garbage chutes, labour, transport required for demolition work and expenses relating to transporting demolition waste off-site.
- .3 Scope of Work is indicated on the architectural, structural, mechanical and electrical Drawings and Specifications.
- .4 Required Work includes but is not limited to the sawing, removal, stripping, demolition, etc. of existing building components to permit the new assemblies as well as all minor work necessary to complete the Work.

1.3 REFERENCES

- .1 CSA S350-M1980, Code of Practice of Safety in Demolition of Structures.
- .2 Security codes for Québec construction work, last edition or revision, particularly section 8 of the Canadian National Building Code.

1.4 EXISTING CONDITIONS

- .1 Take over structures to be demolished based on their condition at time of examination prior to tendering.
- .2 Demolition of spray or trowel-applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered in

the course of demolition work stop work and notify the Architect immediately. Do not proceed until written instructions have been received from the Construction manager.

1.5 DEMOLITION PROCEDURES

- .1 Submit to Construction manager's and Owner's approval the proposed procedures indicating clearly and in detail the sequence of the work and temporary protection measures that will be taken so as not to disturb the use and occupancy of the rest of the building.
- .2 Protect building and its content at all times.

1.6 PROTECTION

- .1 Prevent movement, settlement or damage of adjacent structures, services and parts of existing building to remain. Provide bracing, shoring and underpinning as required. Make good damage caused by demolition.
- .2 Take precautions to support affected structures and, if safety of building being demolished or adjacent structures and services appear to be endangered, cease operations and notify Construction manager.
- .3 Prevent debris from blocking surface drainage system, and mechanical and electrical systems which must remain in operation.
- .4 Inform Construction manager of any conditions that may incur additional costs to Project or compromise the solidity of the building and the Work.

1.7 DEMOLITION DRAWINGS

- .1 Where required by authorities having jurisdiction, submit for approval drawings, diagrams or details showing sequence of disassembly work and supporting structures and underpinning if required.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Not used.

PART 3 - EXECUTION

3.1 WORK

- .1 Dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.
- .2 All products of demolition or removal must be offered to the Owner before disposition. All materials not recuperated by Owner are to be stored off site in closed containers and disposed of in approved dumps.
- .3 Carefully removes materials to be recuperated and store them in a well-protected area in accordance with Owner's instructions.

3.2 SAFETY CODE

- .1 Unless otherwise specified, carries out demolition work in accordance with indicated reference standards and regulations and the safety requirements of the General Conditions.

3.3 PREPARATION

- .1 Disconnect electrical and telephone service lines entering parts of building to be demolished in accordance with authorities having jurisdiction. Post warning signs on electrical lines and equipment which must remain energized to serve other sectors during period of demolition.
- .2 Disconnect and cap mechanical services in accordance with authorities having jurisdiction.
- .3 Do not disrupt active or energized utilities designated to remain undisturbed.

3.4 DEMOLITION

- .1 Consult architectural, structural, mechanical and electrical Drawings for description and location of the Work.
- .2 Partially demolish as indicated and only at locations where required by the nature of the Work.
- .3 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.
- .4 At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements at all times.

- .5 Demolish to minimize dusting. Keep materials wetted.
- .6 Use only appropriate and adequate demolition equipment.
- .7 Do not sell or burn materials on site.
- .8 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.
- .9 Contractor must avoid overloading existing parts of the building to prevent any damage.
- .10 Perform demolitions in small parts. Carefully remove and evacuate large and heavy components.
- .11 If demolition work entails installing temporary supports or bracing, Contractor must install these at his own expense.
- .12 Contractor's demolition procedures must be controllable. Demolition work must be performed using appropriate equipment of sufficient capacity without being superfluous. Contractor must perfectly control all phases and be able to foresee the effects of his actions on the components being demolished and on the remaining portions of the Work.
- .13 If, in the opinion of the professionals or the representatives of the various safety and regulatory agencies, the Contractor's proposed methods of demolition risk causing damages or inconveniences to persons, property or to the environment, they can require that such methods be modified or adapted, to the Contractor's sole expense.
- .14 The Architect's intervention does not relieve the Contractor of his responsibilities. Inversely, the Architect's non-intervention does not constitute an approval of the Contractor's procedures or methods.
- .15 Any drilling or coring work of structural elements must be approved by the Architect and the structural Engineer.

PART 1 – GENERAL

1.1 RELATED WORK

- .1 Concrete Reinforcement, Section 03200;
- .2 Cast-in-place, Section 03300.

1.2 REFERENCE STANDARDS

- .1 Do concrete formwork in accordance with CSA-A23.1-M94, except where specified otherwise.
- .2 Do false work in accordance with CSA S269.1- 1975, except where specified otherwise.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01300 - Submittals.
- .2 Indicate method and schedule of construction, materials, arrangement of joints, ties, shores, liners, and locations of temporary embedded parts.
- .3 Each shop drawing submitted to bear the stamp and signature of qualified professional engineer registered in the Province of Québec.

1.4 MEASUREMENT FOR PAYMENT

- .1 No measurement will be made under this Section. Include costs in items of work for which concrete is required.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Formwork lumber: plywood and wood formwork materials to CSA-A23.1M94.
- .2 Form stripping agent: colorless mineral oil, free of kerosene, with viscosity between 70 and 110 s Saybolt Universal 15 to 24 mm²/s at 40 °C, flashpoint minimum 150 °C, open cup.
- .3 Form ties: removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diam. in concrete surface.

PART 3 – EXECUTION

3.1 ERECTION

- .1 Verify lines, levels and column centers before proceeding with formwork and ensure dimensions agree with drawings.
- .2 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1-M94.
- .3 Obtain Engineer's approval for use of earth forms.
- .4 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .5 Align form joints and make watertight. Keep form joints to minimum.
- .6 Use 25 mm chamfer strips on external corners of beams, joints and columns.
- .7 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .8 Clean formwork in accordance with CSA-A23.1- M94, before placing concrete.
- .9 Leave formwork in place for following minimum periods of time after placing concrete. Refer to CSA-A23.1- M94.
- .10 Re-use of formwork and false work subject to requirements of CSA-A23.1-M94.

PART 1 - GENERAL

1.1 RELATED WORK

- .1 Concrete Formwork, Section 03100;
- .2 Cast-in-place, Section 03300.

1.2 GENERAL CONDITIONS

- .1 The following information in this specification. The general, special or distinctive conditions and all types of clauses, sections or other specifications made by the architect.

1.3 REFERENCE STANDARDS

- .1 Do reinforcing work in accordance with CSA-A23.1-M94, and welding of reinforcing with CSA W186, except where specified otherwise.

1.4 SOURCE QUALITY CONTROL

- .1 Provide Engineer with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 3 weeks prior to commencing reinforcing work.
- .2 Inform Engineer of proposed source of material to be supplied.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01300 - Submittals.
- .2 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and mechanical splices, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacing and location of chairs, spacers and hangers. Do drawings in accordance with "Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Quebec". ACI Manual of Standard Practice for Detailing Reinforced Concrete Structures.
- .3 Furnish relative details to be placed on framework in specific conditions
- .4 Design and detail lap lengths and bar development lengths to SA-A23.3-M94.

1.6 MEASUREMENT FOR PAYMENT

- .1 No measurement will be made under this section. Include costs in items of concrete work for which reinforcement is required.

1.7 SUBSTITUTES

- .1 Substitution of different size bars permitted only upon written approval of Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Reinforcing steel: billet steel, grade 400, deformed bars to CSA G30.12-M1977 unless indicated otherwise.
- .2 Cold-drawn annealed steel wire ties: to CSA G30.3-M1983.
- .3 Chairs, bolsters, bar supports, spacers: to CSA-A23.1-M94.
- .4 Mechanical splices: subject to approval of Engineer.

2.2 FABRICATION

- .1 Fabricate reinforcing in accordance with CSA-A23.1-M94.
- .2 Obtain Engineer's approval for locations of reinforcement splices other than shown on placing drawings.
- .3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

PART 3 - EXECUTION

3.1 FIELD BENDING

- .1 Do not field bend reinforcement except where indicated or authorized by Engineer.
- .2 When field bending is authorized, bend without heat, applying a slow and

steady pressure.

- .3 Replace bars which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1-M94.
- .2 Prior to placing concrete, obtain Engineer's approval of reinforcing steel and position.
- 3 Clean framework elements before pouring the concrete.
- .4 Place a layer of paint on the asphalt or lead on the clamped area that must divest itself in the hardened concrete. When the paint is dry, place an even and generous layer of mineral grease.

PART 1 - GENERAL

1.1 RELATED WORK

- .1 Concrete Formwork, Section 03100;
- .2 Concrete Reinforcement, Section 03200.

1.2 REFERENCE STANDARDS

- .1 Do cast-in-place concrete work in accordance with CSA-A23.1-M94, except where specified otherwise.

1.3 SAMPLES

- .1 At least 2 weeks prior to commencing work, inform Engineer of proposed source of aggregates and provide access for sampling.

1.4 MEASUREMENT FOR PAYMENT

- .1 There are no measurements to be taken in this section. Include the prices for the construction phases which require concreting, that is comprised of an opening protected against the cold, if the need arises.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Portland cement: to CAN3-A5-M1983.
- .2 Water, aggregates: to CSA-A23.1-M94.
- .3 Air entraining admixture: to CAN3-A266.1.
- .4 Chemical admixtures: to CSA-A266.2. Engineer to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .5 Shrinkage compensating grout: premixed compound consisting of metallic aggregate, cement, water reducing and plasticizing agents capable of developing compression strength of 50 MPa at 28 days.
- .6 Resumption of products: use an epoxy approve by the Engineer. Furnish the making and application methods and physical characteristics of the product

furnished by the manufacturer. Epoxy resin capsules: which consist of two components. The resin must have a minimal resistance of:

- .1 oneaxeled when crushed: 86 N/mm²;
- .2 attraction: 22 N/m²;
- .3 when cut: 52 N/mm².

2.2 CONCRETE MIXES

- .1 Proportion normal density concrete in accordance with CSA- A23.1-M94 to give following properties:
 - .1 Cement: use type 10;
 - .2 Minimum compressive strength at 28 days: 32 MPa;
 - .3 Minimum cement content: 285 kg/m³;
 - .4 Class of exposure: A;
 - .5 Nominal size of coarse aggregate: 10 mm;
 - .6 Air content: 5 to 8 %;
 - .7 Slump at time and point of discharge: 20 to 80 mm.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- .1 Obtain Engineer's approval before placing concrete. Provide 24 h notice prior to placing of concrete.
- .2 Placing concrete in accordance with CSA- A23.1-M94.
- .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .4 Prior to placing of concrete obtain Engineer's approval of proposed method for protection of concrete during placing and curing.
- .5 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place steel dowels and pack solidly with shrinkage compensating grout to positively position and anchor dowels.
- .6 Do not place load upon new concrete until authorized by Engineer.

3.2 INSERTS

- .1 Set sleeves, ties, pipe hangers and other inserts and openings as indicated or

specified elsewhere. Sleeves and openings greater than 100 x 100 mm not indicated on structural or civil drawings must be approved by Engineer.

- .2 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Engineer before placing of concrete.

3.3 FINISHING

- .1 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.
- .2 Pass over the superior concrete surfaces with the trowel to obtain a smooth finishing.

3.4 SPALLED CONCRETE

- .1 Remove all defect, dirty or contaminating particles and repair the concrete, following the Engineers instructions.

3.5 FIELD QUALITY CONTROL

- .1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Owner in accordance with CSA-A23.1-M94.
- .2 Owner will pay for costs of tests as specified in Section 01410 - Testing Laboratory Services.
- .3 Engineer will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .4 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

PARTIE 1 - GENERAL

1.1 SCOPE OF WORK

- .1 Supply and install the concrete or the mortar and the various accessories.
- .2 Install concrete embedded parts.
- .3 Caulk the insulation and control joints.
- .4 Finish concrete surfaces.
- .5 Repair defective concrete surfaces.
- .6 Curing and protect the concrete.

1.2 RELATED WORKS

- .1 Cast-in-place concrete. section 03300

1.3 GENERAL CONDITIONS

- .1 The general conditions, particular conditions and any other provisions, sections and others, listed in the book of specifications, are an integral part of this quotation.

PARTIE 2 - PRODUCTS

2.1 GENERAL

- .1 Repair concrete wall surfaces with the use of a bonding agent and repair mortar.
- .2 Since all cracks and pockets (voids) repairs required may not be indicated on the plans, the Contractor must visit the work site to establish the scope of work.

2.2 MATERIALS

- .1 Bonding agents:
 - .1 «SikaTop Armatec 110 epocem» from «Sika» is triple components cement bonding liquid base agent, with a modified epoxy base. The concrete must be saturated.

.2 Repair mortar:

- .1 «SikaTop 123 PLUS is a cement base, fast bonding, two components waterproof grout, polymer modified. The PLUS stands for corrosion inhibitor transfer agent and formulated to be applied with a trowel, it is designed to repair vertical and above head surfaces to the temperatures between 1° C et 10° C. Also, can be used for sealing product for fissures of 6mm or less.
- .2 «SikaTop Seal 111 PLUS » is a grout with two components (2), with a fast hold, with concrete base, with free flow, modified polymer, PLUS migrant inhibitory agent of corrosion. Easy to level on paving stone and flow easily under the equipment and the support system between the piping, the pillar and opening. For majors reparations, used with a formwork and a clean aggregate with IPG <10. The conformity of the stone should be verified by a Laboratory.
- .3 "Sikament Grout Aid SC" is a balanced mixed of powder additive intended to product a cement grout of Portland concrete.
- .4 "Sika Top Seal 107" is an impermeable cement grout of two components (2), with concrete base, modified polymer. For application on concrete surface and stonework to prevent the water infiltration. Use outside and inside for the waterproof and the sealing of the concrete surface and the stonework for the repairing and the protection against the damages caused by the frost and the defrost of the deglazing salt.

.3 Cloggage resin:

- .1 «Sikadur 31 HI-Mod Gel » is a two components, structural epoxy resin paste adhesive, free of solvents and damp resistant. Seals the cracks surrounding grout holes before the application of pressure injected resin.
- .2 «Sikadur 52 » is a two components grouting epoxy, free of solvents and damp resistant. It is a high strength and high modulus adhesive, specifically designed to caulk cracks on dry and wet withes, trough gravity feed or pressure injection.

.4 Sealing agent:

- .1 «Sikaflex 1a » is a single component, polyurethane base elastomeric material designed to seal expansion/contraction joints, which anticipated expansion will affect 25 % of their designed width. It is a high

quality sealing agent that will not slump under heavy duty, maturing or damp conditions. Designed to seal joints not exceeding 13 mm in depth, with a maximal expansion of 25%.

- .5 Decorative elastic casing used to fill cracks:
 - .1 «Sikagard 550 elastic» is a water base protective and decorative covering for concrete. To its aesthetical properties, it combines its elastically properties to fill micro fissures and its protecting properties to minimize carbonation, water and chloride infiltration. Use with the "Sikaguard 552W Elastic primer".

PARTIE 3 - EXECUTION

3.1 INSTALLATION

- .1 Install the bonding agent, the repair mortar and elastic covering in accordance with the manufacturer's instructions.
- .2 On all wall surfaces, clean the concrete and remove falling parts with a sand blaster or high pressure water jet, along with the appropriate mechanical equipment.
- .3 Equal the cracks to obtain a 13 mm minimal width and degrade surfaces to ensure that concrete repairs reach a minimum of 13mm in depth.

Bonding agent

- .1 Surface preparation:
 - .1 Using a sandblast, a high pressure water jet or any other appropriate mechanical equipment, remove damaged concrete, dirt, oil, grease any other substance that could prevent a proper adhesion to the surface. Absorbent surfaces should be pre-saturated with clean water. Absorbent substrate surfaces should be dry saturated before application.
- .2 Application:
 - .1 Water the prepare substrate until the concrete is fully saturated, and then apply, using a paint brush, a paint roller or a gun, a second coat of bonding agent that is at least 0.05mm thick. For best results, thoroughly mix the bonding grout in the substrate to ensure that all surface

irregularities are fully covered. Apply the freshly mixed veneer insert mortar over the bonding grout.

.3 Restriction:

- .1 Minimal application temperature (ambient air and substrate): 5°C.
- .2 max. temperature of substrate: more than 30°C.
- .3 Conform to the recommended dosage. Do not, under any circumstances, add water to the mix.

Repair mortar

.1 Surface preparation:

- .1 The surface to be repaired must be at least 13mm in depth.

.2 Application and finishing:

- .1 Apply the mortar before the « SikaTop Armatec 110 » coat is dry and flatten the surface. Let the mortar take the initial set (20 to 30 minutes after the application at 23°C), and then use a metallic trowel, to obtain a flat surface, or jute to obtain a heavy texture. To obtain a very smooth finish, wipe the metallic trowel with the «A » compound during the finishing work. If the repair calls for more than one coat, each coat must be applied as soon as the one underneath can support it and all surfaces, except for the last one, must have a heavy texture. If a surface was not finished at the end of the day, roughen again the next day and remove any polymer coating to ensure a proper continuity.

.3 Curing:

- .1 To obtain a result that is consistent with the technical data, a proven curing method, such as damp jute, polyethylene or a proven « Sikagard cure/hard » curing agent must be applied. Protect freshly installed mortar from the rain. To prevent icing or damage from any other adverse conditions, cover with an isolating material.

.4 Limitations:

- .1 Minimum coat thickness: 13 mm
- .2 Minimum temperature of application: 8°C

Cloggage resin:

.1 Crack preparation

- .1 Remove damaged concrete to the sound support surface.
- .2 Remove any unsound or incompletely adherent repair or resurfacing.
- .3 Support surfaces will be sound, stable, solid, clean and free of dust, grease, paint, tar, wax and sealing, curing and form removal agents, primers, laitance, unadherent particles and foreign substances that might impair adherence.

.2 Application and finishing:

- .1 First, clog the cracks on the outside surfaces of the wall applying "Sikadur 31 Hi-mod gel" like bonding agent and after finish the concrete surface with "Sika Top 123 PLUS".
- .2 Proceed to the injection of the outside surfaces of the wall. For cracks that less than 6mm, use « Sikadur 31 » and "Sikament Grout Aid SC" for cracks exceed of 6mm.
- .3 Before applying the decorative covering, grind any excess resin.

Sealant:

.1 Surface preparation:

- .1 Remove damaged concrete up to the sound support surface.
- .2 Remove any unsound or incompletely adherent repair or resurfacing.
- .3 Support surfaces will be sound, stable, solid, clean and free of dust, grease, paint, tar, wax and sealing, curing and form removal agents, primers, laitance, unadherent particles and foreign substances that might impair adherence.

.2 Sealant application:

- .1 With a saw, widen the opening of the joint, if necessary, to a minimum of 6mm.
- .2 Apply « Sikaflex 1a » along the joint to seal.

Elastic and decorative covering

- .1 At the end of the preparation work, as indicated on the Architect plans, apply on all walls surfaces, one coat of « Sikagard 552W Elastic primer » on the rate of 4m² / litres and two covering coats of « Sikagard 550 W Elastic », of the rate of 4m² / litre for each coat.
- .2 Second finishing coat: "Sikagard 550W Elastic" with silica sand added to obtain the same texture and color as the surfaces of the workshop #1. Furnish a sample of 300mmx300mm.
3. Type of applicator recommended: "TEXSPRAY 110 of GRAYCO."

PART 1 - GENERAL

1.1 RELATED WORK

- .1 Not applicable

1.2 SCOPE OF WORK

- .1 This section: covers all the works and procedures pertaining to structural steel (steel joists) and steel decks.
 - .1 design of the assemblies;
 - .2 preparation of shop drawings;
 - .3 supply and manufacturing of structural steel and steel deck, including welding and painting;
 - .4 supply of corner plates and concrete embedded plates;
 - .5 galvanizing;
 - .6 location and delivery of the structural steel and the steel deck on the site;
 - .7 erection of the structure and installation of the steel deck, including related welding, assembly and painting works.
- .2 The Contractor must supply all the materials, scaffolds, tooling and manpower required and necessary to complete the metallic framework and the installation of the steel deck.
- .3 The metallic frameworks include, but are not strictly limited to:
 - .1 all framework elements, including corners angles, beams, joists, posts, trusses, steel joists, metallic decks, as well as wales, supports, assembly and course bolts and shears connectors being used to obtain a complete installation.

1.3 REFERENCES

- .1 The standards and publications hereafter are mentioned in the section of the book of specifications and must referred to:

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- .1 Canadian Standards Association (CSA):
 - G40.21-M1981 "Structural Quality Steels"
 - W47.1-1992 "Certification of Companies for Fusion Welding of Steel Structures"
 - W48.1-M1980 "Mild Steel Covered Arc-Welding Electrodes"
 - W55.3-1965 "Resistance Welding Qualification Code for Fabricators of Structural Members Used in Building"
 - W59-M1984 "Welded Steel Construction (Metal Arc Welding)"
 - CAN/CSA-S16.1-94 "Steel Structures for Building (Limit States Design)"
 - CAN/CSA-S136-94 "Cold Formed Steel Structural members"
 - .2 American Society of Testing and Materials (ASTM)
 - A325M-M83 "High Strength Bolts for Structural Steel Joints"
 - A446-76 "Standard Specification for Steel Sheet Zinc Coated (galvanized) by the Hot-Dip Process, Structural (Physical) Quality"
 - A525-81 "General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the hot-dip Process"
 - .3 CISC/CPMA1-73a "A Quick-Drying One-Coat Paint for Use on Structural Steel"
- .2 Unless otherwise indicated, executes the structural steel works in accordance with the S136-94, CAN3-S16.1- 94 standards and the weld works in conformity with the CSA W59-1984 standard.
 - .3 Framework welding must be executed by a duly appointed member of the "Canadian Welding Bureau", in regard to the requirements of the CSA W47.1 and W55.3-1965 standards. The Contractors must verify if their sub-contractor is a duly appointed member of the CWB before accepting their quote, for the Engineer will refuse any contractor not meeting this requirement.

1.4 SHOP DRAWINGS

- .1 Submit to the Engineer the shop drawings, in conformity with the requirements listed in the "General conditions".
- .2 Each drawing submitted must bear the seal and signature of a duly appointed engineer of the Ordre des Ingénieurs du Québec.
- .3 Shop drawings must clearly indicate all the mounting and design details, including cutaway views, cutouts, assemblies, drilling, threaded anchorings, bolts and weld works. Use the symbols indicated in the CSA W59-1984, annex D standard to illustrate the weldings.
- .4 Submit to the Engineer a description of the work method, the mounting order for the elements and the type of material the Contractor intends to use. Although this requirement is respected, the Contractor is fully liable in regard to the use of methods, equipment, execution mode and safety measures.
- .5 For the steel joists, indicate on the shop drawings the spacings, anchoring and support details, apertures reinforcements, accessories, list of materials, depth indications, loadings et other relevant details.
- .6 For the metallic joists, indicate on the shop drawings the position of the different elements, the profiles, dimensions, metal sheet thickness, support assemblies and their spacings, the reinforcements, galvanized flashings, accessories and other related details.
- .7 For the steel decks, clearly indicate on the shop plans, if the design stipulates it, the required position and strength of the temporary supports in order to allow the concrete work for the concrete slab.

1.5 DESIGN OF DETAILS AND CONNECTIONS

- .1 Design the details of the assemblies and related works in respect with the requirements of the CAN3-S16.1-94 and CSA S136.1-94 standards, in order to support the loads and/or forces, at the times and shear forces indicated on the plan.
- .2 For the assemblies, follow the general typical disposition indicated on the Engineer's drawings.
- .3 Select the arrangement and size of weldings to adequately transmit the loads.
- .4 For standard assemblies , choose the appropriate standard assemblies details

to ensure the solidity of the work, as described in section 3 of the "Handbook of Steel Construction", CISC.

- .5 For non-standard assemblies, submit sketches and calculations bearing the seal and the signature of a competent professional engineer, member of the Ordre des Ingénieurs du Québec.
- .6 The depth of a beam assembly must never be inferior to 50% of the depth of the beam. There must be at least two bolts on every beam assembly (including those made with "Hilti" bolts).
- .7 When shimming is required for the seating, design and detail them so that they may support the indicated stresses and that they can be adjusted to adapt to the effective work site conditions; weld all the parts forming a shim between them and the seating.

1.6 DIMENSIONS, MEASUREMENTS AND LEVELS

- .1 Before the manufacturing of the framework elements, the Contractor will take and verify, on the site, all the dimensions, measurements and levels, in order to compare them with de plans or to complete the plans. He will notify the Engineer of any toe-outs on the job site so that the latter may make the appropriate decisions.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Structural steel
 - .1 All materials must be free of dirt, rust, scales, pinholes, leafings or any other fault. Used materials will not be accepted.
 - .2 General structural steel; conform to CSA G40.21-M81, type 300 W standard.
 - .3 Hollow profile (HSS) and angle plates for the joists: conform to CSA G40.21-M81, type 350 W standard.
 - .4 High strength bolts, nuts and washers: conform to ASTM A325 M-83 standard.
 - .5 Anchoring bolts: conform to CAN3-G40.21-M81, type 300 W standard.

- .6 Weltering materials: conform to CSA W59-M84 and CSA W48 series standards.
 - .7 Factory applied primer: conform to CISC/CPMA 1-73A standard.
 - .8 Shear connectors: conform to CSA W59-1982 5.5.6 provision and its H annex.
 - .9 Non-shrinking grout: Pre-mixed compound, Portland cement base, with appropriate consistency at pouring and able to develop a 50 MPa at 28 days resistance to compression, subject to the approval of the Engineer.
- .2 Steel deck
- .1 Steel deck conform to CSA S136-94 standard, manufactured from steel plates conform to grade A ASTM A446 standard, with a base metal designed thickness as indicated on the plans and a zinc covering Z-275 or G-90 designation for commercial buildings.
 - .2 Closing plates for cell butt-ends and higher if necessary, to serve as concrete formworks: as indicated on the plans or otherwise specified galvanized steel plate, at least 3mm in thickness.
 - .3 Pre-mixed Zinc enriched primer, conform to ONGC-1GP-181M standard.

2.2 SHOP PAINTING

- .1 Clean, prepare and dress in conformity with the CAN3-S16.1-94 standard.
- .2 All surfaces must be dry, free of oil, rust, grease, dross deposits, etc., prior to the application of the base coat.
- .3 On all structural steel, a primer coat conform to CISC/CPMA 1-73a standard.

2.3 MARKING

- .1 Identify the materials in conformity with the CAN3-G40.20-M81 standard. Do not use a swaging punch. If the steel part is not to be painted, stamp the marking on the sections that are not visible from the exterior after the mounting.
- .2 Assembly markings: to simplify assembly and adjustments, factory mark load bearing ensembles and joints.

2.4 MANUFACTURING

- .1 Structural steel
 - .1 Shape the steel elements in conformity with the CAN3-S16.1-94 standard and the approved shop drawings.
 - .2 Structural members consisting of welded sections will be rejected if they are not shown as such on the shop drawings.
 - .3 The use of members on which the quality and/or the dimensions differ from those indicated is strictly forbidden without the written consent of the Engineer.
 - .4 The passage holes for bolts must be drilled or punched. Burning or blowtorch cutting is prohibited.
 - .5 Work and mounting tolerances are respectively those of the CAN3-S16.1-94 standard.
 - .6 If needed, reinforce the openings in order to maintain the required calculated resistance.

2.5 CONNECTION TO EXISTING WORK

- .1 Verify the existing frame dimensions before shaping new elements.

PARTIE 3 - EXECUTION

3.1 ERECTION

- .1 Structural steel
 - .1 Mount the steel elements in conformity with the indications of the CAN3-S16.1-94 standard and the approved shop drawings.
 - .2 Obtain a written authorization of the Engineer before cutting or altering the structural steel members on the site.
 - .3 At the end of mounting procedure, touch-up the bolts, weldings and surfaces on which the factory applied primer was degraded or removed.
 - .4 All steel elements will be delivered on the site, handled and stored in a

manner preventing any damage. Damaged members or assemblies will be rejected.

- .5 Steel burning with oxy-acetylene blowtorch to correct defects will be prohibited. In fact, boring will be the only acceptable method allowed for structural adjustments.
- .6 The Contractor must ensure that the structures already completed or in the process of being completed on the site will not be overloaded in excess of the admissible loads indicated on the plans of these structures.

.2 Steel deck

- .1 Unless otherwise indicated, execute the steel deck works in conformity with the Canadian Steel Sheet Building Institute standard.
- .2 Mount metal bridging in strict accordance with the shop plans.
- .3 Cover as many bays possible with each metal bridging element (a minimum of two bays is mandatory).
- .4 Overlaps the joints as much as possible and locate all joints over a support point (a 50mm minimal overlapping is required).
- .5 Fix the bridging to the support through the use of a welded 3/4" ϕ washer on the support steel and located at every second upstand beams in contact with the apron, unless otherwise indicated.
- .6 Connect the contiguous portions of the bridges by framing and fixing at 600-mm centers the male and female portions of the covering joints.
- .7 Reinforce the openings in the bridge openings in order to maintain the required calculated resistance.
- .8 After the permanent installation of the steel deck, perform touch-ups, with the specified zinc enriched primer, on all galvanized surfaces burned because of welding (if necessary).

3.2 INSPECTION AND QUALITY CONTROL

- .1 During manufacturing and assembly, the Engineer may, at any time, visit the shop to inspect the work.
- .2 The Engineer may impose that tests, appraisals and analytical derivations be

performed. The Contractor must replace, at his expenses and without unduly delaying the project, any defective work or material.

- .3 At the request of the Engineer, the Contractor will submit a certificate stipulating that the quality of the steel used conforms to the requirements of the contract documents.
- .4 Submit to the Engineer certified copies of steel factory inspection reports pertaining to the chemical and physical characteristics of the steel used.
- .5 A test laboratory, approved by the Engineer, will be allowed to inspect and run tests on the materials and the workmanship.
- .6 All factory executed weldings must be inspected before they leave the factory.
- .7 The Contractor will visually inspect all weldings in order to assess their conformity to the shop drawings requirements in terms of type, dimensions, length and location and that they show no superficial defects, cracks, undercuts, overlaps and porosity.
- .8 Following the visual inspection, the rejected welding sections must be repaired.
- .9 The Engineer may require that a laboratory perform resuage magnetic particle inspection, radiograph or ultrasound tests on specific important weldings. The Contractor must fully collaborate to the tests and execute, if necessary, the required repairs following these inspections.
- .10 Repaired welding sections must be integrally reinspected in the same manner that was used for the first inspection.

3.3 ASSEMBLY

- .1 Execute the assemblies in strict conformity with the approved shop drawings.
- .2 Factory assembly must be executed by means of weldings. On the site, the assemblies must preferably be performed with the use of high-pressure bolts, screwed in place with the "rotating nut" method of the CAN3-S16.1-94 standard.

3.4 GROUTING

- .1 Where indicated on the plans, following the erection and alignment of the framework, completely fill the void underneath the base plates of the columns

or other supports, using the specified non shrinking grout and in conformity with the manufacturer's written instructions.

3.5 GALVANIZATION

- .1 The steel must be hot dipped galvanize following its manufacturing, in conformity with the CSA G164-M81 standard and a designed rate of 600 grams per square meter.
- .2 Use "Prime Western" quality zinc, or better.
- .3 No manufacturing must be done after galvanizing, except for the tapping of the nuts tapping and holes in some cases.
- .4 Galvanizing must be hot dipped in order to obtain a continuous zinc coat, of uniform thickness, that perfectly adheres to all steel surfaces and ensures a complete protection of the metal after the mounting.
- .5 Each part or member must be galvanized in a single dip.
- .6 If more than 55 of the members of equal dimensions present galvanizing defects, the procedure must be stopped and altered in order to obtain a satisfactory result. All necessary precautions must be taken to avoid bending or racking during the process of galvanization.
- .7 Finished surfaces must be clean and smooth. The zinc coating must have an adequate thickness and uniformity to undergo the prescribed tests.
- .8 Prior to being galvanized, the steel must be free of paint, grease, rust, slags or any other material that might prevent a perfect bonding of the zinc coat on the steel.

PART 1 - GENERAL

1.1 NOTICE TO CONTRACTOR

- .1 This Section's Contractor must read the entire Project specifications and take note of all Work related to this Section and concerning the various trades. He must foresee and execute, at his expense, all minor work related to this Section required or necessary to complete the Work even though these are not described in the specifications.
- .2 Work of this Section must adapt itself perfectly to the work of other trades and must be performed in a satisfactory manner and at proper times so as not to delay the construction schedule.
- .3 Any errors, omissions and imperfections in the work of other trades may not serve as an excuse or pretext for errors, omissions or imperfections in the work of this Section's contractor.

1.2 SCOPE OF WORK

- .1 Contractor must supply the following: accessories, tools and labour required to complete all work described in this Section and indicated on the Drawings.
- .2 Without limiting the above, the following items are a general and non-detailed description of the work included in this Section. Contractor must thoroughly examine the Drawings to complete this list:
 - all steel items;
 - all other metal items not necessarily shown on the Drawings and/or described in this Section but required for a complete and satisfactory completion of the Work.

1.3 RELATED WORK

- .1 Structural steel Refer to Engineer's specifications
- .2 Finish painting Section 09900.

1.4 PRELIMINARY INSPECTION

- .1 Contractor must verify if previously executed surfaces and work conditions are appropriate to receive the work described in this Section. Advise Architect of any defect or error and do not proceed with the Work until necessary corrections have been performed.

- .2 Architectural metals to be fabricated to the required dimensions. Fabricate materials taking into consideration all cutting and adjustment work required to be performed on site.

1.5 REFERENCE STANDARDS

- .1 Perform steel work in accordance with CSA S16 unless specified otherwise
- .2 Do welding work in accordance with CSA W59, latest edition, unless specified otherwise.

1.6 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01300 - Submittals.
- .2 All submitted shop drawings must be signed and sealed by a qualified Engineer and licensed member of the Quebec Order of Engineers.
- .3 Indicate cuts, mortises, assemblies, drillings, threaded anchors, rivets, welds and other required items. Use AWS symbols to indicate welding details.
- .4 Clearly indicate general arrangement, material quality, dimensions, finishes, clearances, reinforcing, anchors and necessary hooks.
- .5 For all shop fabricated items, and when Architect deems it necessary to illustrate the projected Work, Contractor must submit for review, and at proper time, all shop and assembly diagrams and drawings.
- .6 Architect is not required to verify quantities and dimensions shown on shop drawings, this being the contractor's responsibility. Architect is also not responsible for dimensions indicated on the Drawings; such dimensions must be verified directly on site by the contractor.

1.7 STORAGE AND HANDLING

- .1 Deliver materials in original undamaged containers with labels and seals intact. Handle and store all prefinished materials with proper care to prevent any damage.
- .2 Store materials in a way to avoid any personal injuries, damage to executed work and impeding the normal progress of the Work.

1.8 PROTECTION

- .1 Protect adjacent surfaces and work of other trades from any damage caused by the work of this Section.

1.9 WARRANTY

- .1 Contractor hereby guarantees the finishing, quality and the solidity of his work for a period of two (2) years from the date of substantial completion of the Work.

PART 2 - PRODUCTS

2.1 GENERAL

- .1 Unless indicated otherwise, all exterior steel items are to be hot dip galvanized after fabrication.

2.2 MATERIALS

- .1 Steel sections and plates: to CSA-G40.21- 92, Grade 300W and galvanized.
- .2 High strength bolts, nuts and washers for assemblies: to ASTM A325M. Standard bolts to ASTM A-307.
- .3 Rivets: to CSA-G40.21.
- .4 Welding materials: to CSA W59.
- .5 Shop coat primer: to CGSB-1.40M (see section 09900).
- .6 Galvanizing: hot dipped galvanizing with zinc coating of 0.12 psf to CSA G164, where shown.
- .7 Welding: to CSA W48 Series and CSA W59.
- .8 Galvanized steel touch-up paint: zinc rich, ready mix to CGSB-1.181M, Galvicon Type or approved equivalent.
- .9 Finish painting: refer to section 09900.
- .10 All materials to be new and free of rust due to prolonged exterior storage.
- .11 All metal sections must be supplied in one piece, without welded splices. The

Architect shall refuse any spliced items.

2.3 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Unless shown otherwise on the Drawings, all work of this Section is assembled by welding. Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 In general, all dimensions, gauges, thicknesses and fabrication details are indicated on the Drawings. Follow indicated details. Grind and file all edges of accessible metal items.

2.4 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items. Items painted with special paint systems (refer to Section 09900) must be shop primed. Verify with manufacturer's requirements.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Follow Section 09900 requirements.

PART 3 - EXECUTION

3.1 GENERAL FABRICATION PRECAUTIONS

- .1 Contractor must supply all required bolts, shields and anchors needed to fasten his work and that must be placed into concrete, masonry and elsewhere; contractor must ensure they are placed in their required location.
- .2 Metal work must be complete; metal work will be deemed complete when it is delivered and installed in perfect working order, complete with necessary instructions and warranties.
- .3 Metal items must be free of defects that could diminish their strength or harm their appearance.
- .4 Metal work shall have structural properties permitting them to support all usual loads without danger; they shall be in accordance with details, clean, straight and with exact shapes.

- .5 Curved items must follow indicated radii and their surfaces must be finished smooth, without any defects.

3.2 WELDING

- .1 In general, assemblies are to be welded. In as much as possible, shop-weld items for greater precision.
- .2 Unless indicated otherwise, welds are to be continuous, resistant with tight joints, flush in required plane, clean and smooth.
- .3 All visible welding shall be uniform and cleaned to obtain a neat and uniform appearance.

3.3 ANCHORING

- .1 Contractor must provide all anchors and fasteners required for the solidity of the work and shall adapt his work to the different finishes and job conditions.
- .2 All anchors are to be galvanized steel or stainless steel to suit.

PART 1 - GENERAL

1.1 RELATED WORK

- .1 Metal Flashing and Trim.....Section 07620
- .2 Metal siding / roofing.....Section 07650
- .3 Sealants.....Section 07900

1.2 SOURCE QUALITY CONTROL

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Supply manufacturer's quality Certificate for all pressure treated lumber and plywood.

PART 2 - PRODUCTS

2.1 LUMBER MATERIAL

- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
 - .1 CSA 0141-1970.
 - .2 NLGA Standard Grading Rules for Canadian Lumber, latest edition.
- .2 Pressure treated wood: use pressure treated grey or red pine for the following works:
 - .1 Roof construction: blocking, cant strips, nailers, light framing, copings, etc.
 - 2 Wood to be pressure treated according to article 2.3.

2.2 FASTENERS

- .1 Nails, spikes and staples: to CSA B111-1974.
- .2 Bolts: 1/2" diameter unless indicated otherwise, complete with nuts and washers.
- .3 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.
- .4 Galvanizing: to CSA G164-M1981, use galvanized fasteners for all

pressure treated lumber and plywood.

2.3 WOOD PRESERVATIVE

- .1 Treat under vacuum and pressure all lumber and panel materials indicated, to CSA O80.1, with an average retention of water soluble chromated copper arseniate as follows :
 - .1 Lumber: 0.25 lb / ft³
 - .2 After treatment, dry material to moisture content of 19% or less.
 - .3 Surface-applied wood preservative: coloured, water-repellent preservative recommended by pressure treated wood manufacturer. Use to treat cuts and drillings in pressure treated wood.

PART 3 - EXECUTION

3.1 CONSTRUCTION, GENERAL

- .1 Erect all wood components required to complete the Work. Execute according to details shown on Drawings.
- .2 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .3 All anchors and fasteners to have sufficient dimensions to support all loads.
- .4 All assemblies must be able to resist 25 lbs / ft² wind loads.

3.2 NAILING STRIPS, GROUNDS AND ROUGH BUCKS

- .1 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work, as shown. Bolt all assemblies. Use only pressure treated lumber and panels and galvanized bolts. Countersink bolts to provide clearance for other work.

3.3 ROOF CONSTRUCTION

- .1 Install rough carpentry for roof construction as shown. Mechanically fasten and anchor to structural work and steel stud light framing. Follow indicated details.

- .2 Install blocking and cant strips for roof membranes. Co-ordinate Work with Sections 07620 and 07650.
- .3 Use only pressure treated wood and galvanized fasteners.

3.4 FASTENERS

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other work.

3.5 SURFACE-APPLIED WOOD PRESERVATIVE

- .1 Treat with wood preservative, before installation, pressure treated wood surfaces exposed by cutting, trimming or boring with liberal brush application of preservative.
- .2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.

PART 1 - GENERAL

1.1 RELATED WORK

- .1 Rough Carpentry.....Section 06101.
- .2 Metal siding / roofing..... Section 07650.

1.2 REFERENCES

- .1 Unless otherwise noted in the documents, the standards and recommendations contained in the associations instructions (AERMQ and AMCQ) must be considered as references for the present section. Those recommendations will than become requirements.

1.3 WARRANTY

- .1 Product manufacturer must submit a written warranty, signed and issued in the name of the Owner certifying the performance of his products and the maintenance of their properties that can affect their performance for a period of five (5) years following date of completion of roofing work.
- .2 Roofing Contractor must submit a written warranty, signed and issued in the name of the Owner certifying that all materials and waterproofing work described in this Section shall remain free of any and all defects for a period of five (5) years following date of completion of roofing work.

1.4 SAMPLES

- .1 At Architect's or roofing inspector's request, submit a sample of flashing or trim as required on the Drawings, in accordance with requirements of Section 01300.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01300 - Submittals.
- .2 Clearly indicate dimensions and flashing details, control joints, etc. as well as all other information that Architect may reasonably request.

1.6 STORAGE

- .1 All materials to be delivered on site and stored in their original containers indicating manufacturer's name, quality, weight, applicable standards and any other indication or reference acceptable as a standard.

- .2 Avoid undue accumulation of materials on roofs that could, at certain precise locations, compromise the solidity of such roofs with loads greater than design loads.

1.7 PROTECTION

- .1 Assume responsibility for any eventual damages.

PART 2 - PRODUCTS

2.1 PREFINISHED SHEET STEEL

- .1 24 gauges galvanized steel sheet, commercial quality to ASTM A526, with Z275 designation zinc coating.
- .2 Factory applied paint. Color code: PS211G58 of ALRO or equivalent approved by the architect.

2.2 ACCESSORIES

- .1 Sealant: to CAN/CGSB 19.24-M90 (type 1).
- .2 Cleats: 22 gauge Z275 galvanized steel, minimum 50 mm wide.
- .3 Fasteners: of same material as sheet metal, to CSA B111-1974, ring thread flat head roofing nails of length and thickness suitable for metal flashing application.
- .4 Touch-up paint: as recommended by metal flashing and trim manufacture.

2.3 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in concordance to AERMQ and AMCQ prescriptions as indicated and detailed (with cleats, no visible fasteners).
- .2 Form pieces in 8'-0" maximum lengths. Make allowance for expansion at joints. Provide "S" lock joints to avoid visible fasteners.
- .3 Hem exposed edges on underside 1/2". Miter and seal corners with sealant.

- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

2.4 METAL FLASHINGS

- .1 Form flashings and copings to profiles indicated.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- .1 Ensure plumbing, carpentry and other roof work have been properly completed.
- .2 Do not install when it's raining or snowing.
- .3 Everywhere flashings are required, install treated wood blockings, edges, cants and nailers.

3.2 METAL FLASHINGS

- .1 Install metal flashings where indicated on Drawings.
- .2 Co-ordinate exact flashing shapes with flashing manufacturer.

3.3 INSTALLATION OF FLASHINGS AND SHEET METAL

- .1 Install sheet metal work in accordance with manufacturer's technical data and as detailed on Drawings.
- .2 Use only concealed fastenings.
- .3 Lock end joints and caulk with sealant.
- .4 Insert metal flashing to form weathertight joint.
- .5 Flashings, counter-flashings and copings to have shape and profiles as indicated on Drawings.
- .6 Parapet copings to be installed with care to meet alignments and provide continuous surfaces, free of bumps or depressions. Sheet metal to be brake-formed beforehand to dimensions taken on site and to shapes shown on Drawings. Sheet metal work to be clipped to cleats.

Copings to have a water drip on the outside roof edge and a clip joint on the inside edge.

- .7 Metal work and joints to be straight, square and plumb, cuts to be clean and straight. Brake-formed shapes to be straight, without defects.
- .8 Unless indicated otherwise, no nail or screw shall be visible on exposed metal surfaces.
- .9 Cut, brake-form and prepare metal in the shop using appropriate modern tools and equipment.

PART 1 - GENERAL

1.1 SCOPE OF WORK

- .1 The work described in this section include, without limitation, the provision of all the materials as well as labor and equipment for installing a metal roof, including a metal roof covering, the trim, umbrella and all accessories to allow complete sealing of the system, as well as rigid insulation, the air barrier / vapor and exterior-grade gypsum board.
- .2 It is forbidden to undertake the work which shop drawings, samples and product descriptions have not received approval from the architect beforehand.

1.2 RELATED WORK

- .1 Structural steel and steel decks section 05120
- .2 Sealants section 07900

1.3 REFERENCES

- .1 ANSI B18.6.4-1981 (R1991), Screws, Tapping and Metallic Drive, Inch Series, Thread forming and Cutting.
- .2 ACNOR: S136-94, Éléments de charpente en acier formés à froid.
- .3 CSA: S136.1-95, Commentary on CSA Standard S136-94, Cold Formed Steel Structural Members.
- .4 CAN / CSA-S16.1-94, Règles de calcul aux états limites des charpentes en acier.
- .5 ICTAB: 20M-91, Norme d'industrie: Revêtement en tôle d'acier dans ses applications en architecture et dans l'industrie
- .6 ASTM A653 / A653M-96, Specification for Steel Sheet, Zinc-Coated (Galvanized) by Hot-Dip Process.
- .7 ASTM A755 / A755M-95, Steel Sheet, Metallic-Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
- .8 ASTM A924 / A924M-96a, Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .9 ASTM C79-95, Gypsum Sheathing Board.
- .10 ASTM E72-95, Conducting Strength Tests of Panels for Buildings Construction.
- .11 ASTM E84-96a, Surface Burning Characteristics of Buildings Materials.
- .12 ASTM E96-95, Water Vapor Transmission of Materials.

- .13 ASTM E283-91, Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors under Specified Pressure Differences Across the Specimen.
- .14 CAN / CGSB-51.10 - 92, Isolant en fibre minérales, panneaux.
- .15 CAN / ULC-S102-1988, Surface Burning Characteristics of Building Materials and Assemblies.
- .16 CAN / CGSB-19.13-M87, Mastic d'étanchéité à un seul composant, élastomère, à polymérisation chimique.
- .17 CAN / CGSB-19.21-M87, Mastic d'étanchéité et de scellement pour l'isolation acoustique.
- .18 Code national du Workshop (CNB).
- .19 Provincial codes and standards.
- .20 Contradictory criteria: In case of conflict between the codes, standards and standard references and the present specification, the highest standards prevail.

1.4 DESIGN CRITERIA

- .1 Calculate roofing metal panels in accordance with the requirements of CSA standards and S136.1-95 S136-94.
- .2 The roof panels must be designed to allow the expansion movements and thermal contraction of component materials at a differential temperature of about 1C without putting excessive strain on the fasteners, or cause buckling of the panels break seals or any other damage.
- .3 The joints must be designed to absorb the movements of expansion and contraction between the same panels, and between panels and decking of the roof and, without permanent deformation, damage to packing materials, broken construction joints and sealing or water infiltration.
- .4 All calculations for thermal fasteners should consider the breakout forces.
- .5 The panels must be designed taking into account the tolerances specified for installation of the supporting frame.
- .6 Tolerances to follow when installing the panels:
 - .1 The maximum deviation in the flatness of the elements is 20 mm / 10 m (: po / 30 ft) long.

- .2 The maximum shift in the alignment of two adjacent elements, aligned in the same plane, is 1.00 mm (0.04 in).
- .3 The elements must withstand the static load and wind loads in accordance with the NBC and local regulations. The maximum allowable deflection is 1/240 of the span.
- .4 The panels must be designed to effectively discharge to the outside any condensation that may form within the roof and also rain water that may enter through the joints.
- .7 Provide thermal resistance calculated in the manner established by ASHRAE, taking into account the nominal wind load.
- .8 Provide roofing permeability not to be exceeding $30 \text{ ng} / (\text{Pa}\cdot\text{s}\cdot\text{m}^2)$.
- .9 Calculate roofing taking into account the circulation of air between the outer atmosphere and the inside of the coating.
- .10 Providing an effective vapor barrier that will withstand the negative and positive pressures inside and outside the Workshop, and that will prevent any infiltration or exfiltration by the envelope of the Workshop.

1.5 SAMPLES

- .1 Submit samples in accordance with the requirements of Section 01340-shop drawings, product samples and Mock-up.
- .2 Submit samples of 300 mm (12 inches) long by the full width of the wallboard.
- .3 Submit samples of each color (if any) having a minimum size of 75 mm (3 inches) x 125 mm (5 inches).

1.6 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with the requirements of Section 01340 - Shop Drawings, Product samples and mock-up.
- .2 Shop drawings must show member sizes and profiles, fixing methods, roof plans, details of trim, soffits, fascia, sealed joints of air/vapor barrier and related works.
- .3 All shop drawings will bear the seal of an engineer recognized by the

Ordre des ingénieurs du Québec, at the expense of the contractor.

- .4 The sizes indicated in the plans and specifications are shown for illustrative purposes only. The contractor shall at his own expense, submit calculations to determine the sizes required by the National Workshop Code and those calculations must bear the seal of an engineer recognized by the Ordre des ingénieurs du Québec.

1.7 DOCUMENTS VERIFICATION

- .1 All shop drawings, product specifications, the criteria for calculation and the samples should be checked by the Contractor before being submitted to the architect.
- .2 When submitting documents, notify the architect by writings about content differences (if any) in the documentation.

1.8 WARRANTY

- .1 Immediately after completion and before the release of contractual retentions, provide the architect warranty certificates of each product, as well as a guarantee of the contractor certifying that the products and installation are guaranteed against defects for a period of one year from the date of signing of the Final Certificate of Completion.

1.9 PROTECTION

- .1 Protect prefinished materials during transport, storage on site and assembly in accordance with standards CSSBI.
- .2 When stored at the site, the material must be stacked on wooden blocks and inclined enough to ensure that water does not remain permanently on the stock.

2. **PRODUCTS**

2.1 GYPSUM PANNELS

- .1 gypsum board pannel for outdoor use with tight gypsum core between two sheets of waterproof brown paper with square edges, 12 mm (2 inches) thick, supplied in panels 1220 mm (48 in) mm x 2438 (96 in). These gypsum boards must meet ASTM E72 95 concerning the structural strength tests, the requirement of ASTM C79-95 as well as combustibility characteristics of the surface according to ASTM standards E84-96a or CAN / ULC S102-1988. These panels are mechanically fixed according to

the area of wind loads.

2.2 MEMBRANE

- .1 Adhesive waterproofing membrane 1.1 mm thick type SOPRASEAL Stick Soprema, or equivalent approved by the architect, composed of bitumen modified with thermoplastic polymers. The upper side is covered with a high density polyethylene film. The underside is covered with a silicone release film.

2.3 METAL ROOFING

- .1 Roofing panels must conform to ASTM A653 / A653M 96. Core will be made of steel grade 230 (33), having a minimum yield strength of 230 MPa (33,000 lb / PO5) and admitting a maximum stress of 144 MPa (20,625 lb / PO5). This steel core is coated on both sides with a hot zinc coating, according to the designation Z-275 (G-90), corresponding to ASTM A924 / A924M-96.
- .2 Roofing panels must have the following characteristics:
 - .1 Finish: pre-painted on one side panels.
 - .2 Paint finish: Colour code: PS211G58 of ALRO or equivalent approved by the architect.
 - .3 Thickness of metal to be 24 gauge.
 - .5 mechanically sealed joints profile: TJS panel from VICWEST, or equivalent approved by the architect.

2.4 FINISH MOLDINGS

- .1 Apparent moldings: the incoming parts and sharp edges, flashings and drip coronations, starting bands and openings fittings must be of the same material, color and finish identical to the coating.
- .2 Non-exposed moldings: All parts and clips of Cap flashings are made of hot galvanized steel, according to Z-275 designation (G 90).
- .3 The size of non-exposed and exposed moldings will be 24 gauge and / or of the same caliber as the coating section 2.3.2.

2.5 INSULATION

- .1 For roof overload between 9.6 kPa (200 lb / ft²) and 14.4 kPa (300 lb / ft²) rigid insulation to be extruded polystyrene, compliant with CAN / ULC-S701 type IV with minimum RSI value of 0.88/ 25.4 mm (R5) and the thickness is according to the dimensions shown in the plans.
 - .1 Acceptable Product: Dow Styrofoam SM or equivalent approved by the architect.

2.6 ACCESSORIES

- .1 Sealing Butyl, polyisobutylene-butyl tape with solid content of 100%, 3 mm (1/8 in) thickness of 13 mm (1/2 inch) wide, supplied in rolls, covered with a protective paper
- .2 Closing edges: floppy unicellular PVC foam, same shape as metal coating, arctic climate type.
- .3 Metal closures: Same thickness and the same finish as the adjacent panels.
- .4 thermoplastic rubber.mastic sealant:

2.7 THERMAL CLIPS

- .1 Specially designed concealed fastener systems, all thermal fasteners and the base plates (if required) will be of steel grade 230 (33), to zinc coating designation Z-275 (G-90) and constructed to the dimensions shown to the shop drawings.
- .2 100mm height thermal fasteners to allow thermal expansion. These fasteners must be 1.52 mm (0.060 inch) thick min. (as calculated in section 1.6.4). Fasteners to be installed at all side joints of panels. Spacing to dependent on loads and wind forces of the area.
- .3 If necessary, provide base plates in the attachments to ensure that they are securely retained to core of the deck. Thickness of plate according to calculations included in section 1.6.4 (min.) and a minimum of 178 mm (7 inches) wide x length of thermal fastener.

2.8 SUB-STRUCTURES

- .1 All sub-structure components will be steel grade 230 (33), Z-275 (G-90) zinc coating and constructed according to the dimensions shown in the drawings.

- .2 Sub-structure size elements to be determined by calculations from section 1.6.4, but not less than 1.2 mm (0.048 inches).

2.9 FIXATIONS

- .1 Screws to comply with the manufacturer's recommendations, also with ANSI B18.6.4-1981 (R1991).
- .2 Apparent Screw: cadmium steel tapping screw Type AB # 14 with pre painted hexagonal head, same color to the coating , with incorporated EPDM washer seating. Length to be 19 mm ($\frac{3}{4}$ inch) to join two panels and 25 mm (1 inch) to attach the panels to the brackets.
- .3 Screws for thermal fasteners: carbon steel screw # 14AB, cadmium plated, with hexagonal head, of sufficient length to a penetration of 13 mm in steel deck (see map for number of screw attachment).
- .4 Drywall screws: DekfastJ screw # 12 x 42 mm HEX (1 $\frac{1}{2}$ "') length, with DekfastJ steel washer. Or equivalent approved by the architect.

2.10 FABRICATION

- .1 The manufacturer shall be ISO 9002 registered.
- .2 All the items to be factory made by size, profiles, templates and details shown on shop drawings, including all substructure components and flashings as required by the CSSBI.
- .3 Each piece to be made maximum length.
- .4 All elements to be made from square, levelled, with precision, from dimensions as planned, so they are free from distortion and other defects likely to affect their appearance or efficiency.

3. **EXÉCUTION**

3.1 PREPARATORY WORK

- .1 Protect metal surfaces (that are in contact with concrete, masonry mortar, gypsum, aluminum or other products based on hydraulic binder.) with insulating coating,
- .2 The fact starting the installation constitutes acceptance of the structure by the contractor.

3.2 NEEDED EQUIPMENT

- .1 The installer of this section shall have all the necessary equipment to do the work.
- .2 No abrasive blade will be accepted for cutting steel.
- .3 Use modern equipment such as laser equipment to ensure perfect alignment of the panels and flashings.
- .4 The system shall comply with approved shop drawings.
- .5 Install the liner as required by CSSBI and manufacturer's written instructions.
- .6 The installation should be performed by qualified and experienced personnel. The contractor will be member AERMQ.

3.3 SEALING INSTALLATION

- .1 Drywall must at all times be protected against weather to ensure that they remain dry at all times.
- .2 Set up drywall horizontally or vertically depending on the application, using a Drywall fixing of 1220 mm (48 in) mm x 2438 (96 in) min. All joints to be properly butted together.
- .3 The surfaces must be approved by the architect before applying the membrane.
- .4 Minimum temperature of membrane installation is 5 OC, remove protective paper, always proceed from the lowest level of the roof up and firmly press over the whole surface of the membrane to ensure good adhesion.
- .5 Valleys (if any) must be installed before the edges.
- .6 Minimum overlaps of the membrane to be 150 mm (6 inches) in the longitudinal direction and 75 mm (3 inches) in the transverse direction.
- .7 Verify that the junction between the wall and the roof is sealed to ensure the continuity of the air / steam.
- .8 The contractor must meticulously check membrane at the end of each work day and before installing the insulation.
- .9 Membrane to be protected from excessively high temperatures. Sunlight exposure time, or other weather conditions, should be minimized as recommended by the manufacturer.

3.4 INSULATION AND ROOFING INSTALLATION

- .1 components of substructure to be installed continuously, starter strips, entering and projecting angles parts, edges, ridges and flashing around openings as indicated on the shop drawings.

- .2 Install Shaped, notched and waterproofed closing parts to protect against external weather and roof elements.
- .3 Installation of each panel will be in the following sequence and until the complete installation of the roof:
 - .1 Install base plates if necessary. Ensure that each base plate is attached to at least two (2) ribs of the steel deck, using specified fasteners.
 - .2 Put rigid insulation in place, ensuring that all joints are carefully supported against each other. If two (2) rows of insulation are used, make sure they overlap by at least 75 mm (3 in).
 - .3 Put metal roof panels in place by manufacturer's appropriate methods by respecting joint sequence, nominal panel overlap and ensuring that the side joints are interlocked over the entire roof length. Longitudinal panel joints to be staggered if necessary.
- .4 Place the thermal connector system with the appropriate fasteners. Be cautiously align fasteners in both directions.
- .5 Make openings required in roofing for needs of mechanics and electricity, or any other work. Waterproofing of pipes and other accessories through roofing to be perfectly sealed. Fix each elements to allow expansion and thermal contraction.
- .6 Except profiled panels, never leave steel sheets sharp outer edges apparent. Fold to the inside with a radius of at least 13 mm (2 inches).
- .7 Proceed side seals using a mechanical seamer which is specially designed for this purpose. The Contractor shall ensure that this device is perfectly adjusted to ensure perfect seal of every joint.
- .8 The joints must be sealed at the end of each day.

3.5 CLEANING

- .1 Ensure that all exposed surfaces are free from dirt as sand, various stains, etc.
- .2 Remove excess of sealant using the recommended solvent (see datasheet on seal products).
- .3 Clean yard from metal residues and unused products.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This Section describes sealants used in the following sections:
 - .1 Aluminium doors, frames and windows Section 08120
 - .2 Overhead door Section 08360
 - .3 Glazing Section 08800
- .2 The fact that the Drawings do not indicated all locations to be sealed does not relieve this Section's contractor of his responsibility for the sealing and caulking of all required locations to obtain an uninterrupted weatherproof building envelope. This paragraph applies equally to all other Sections which must refer to this Section for the supply and installation of sealants.

1.2 SAMPLES

- .1 Submit samples in accordance with Section 01300 - Submittals.
- .2 Submit duplicate samples of each type of chosen material and colour.

1.3 MOCK-UP

- .1 Construct mock-ups at locations chosen by Architect, to show shape and depth of joint complete with back-up material, primer, caulking and sealant. Mock-up may be part of finished work.
- .2 Have Architect approve mock-ups before proceeding with sealant work.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels intact. Protect from freezing, moisture and water.

1.5 ENVIRONMENTAL AND SAFETY REQUIREMENTS

- .1 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

- .2 Ventilate work area as directed by Architect by use of approved portable supply and exhaust fans.

1.6 WARRANTY

- .1 Submit a written warranty, signed and issued in the name of the Owner certifying that sealant work specified in this section is guaranteed against seal failure, cracking, blistering, loss of consistency or adhesion and staining of adjacent surfaces for a period of five (5) years following date of substantial completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Unless otherwise indicated, sealants selected for this project must be on the list of approved products drawn up by the Commission approval of the ONGC sealants. In the case of sealing products registered with a primer, only the selected primer must be used with sealant.
- .2 Type 1 sealant: to CAN/CGSB-19.24-M90.
 - .1 Chosen product: Tremco DyMeric.
 - .2 Use type 1 sealant at following locations:
 - .1 metal flashing and trim joints;
 - .2 around all openings in exterior walls, on the outside;
 - .3 and where indicated on the Drawings.
- .3 Type 2 sealant: to CAN/CGSB-19.13-M87.
 - .1 Chosen product: Tremco Dymonic.
 - .2 Use type 2 sealant at following locations:
 - .1 around all openings in exterior walls, on the inside;
 - .2 and where indicated on the Drawings.
 - .4 Colour of sealants to be paired with adjacent painting, see painting section 09900.
 - .5 Other required types of sealants are indicated in the pertinent specifications Sections and shall be installed in accordance with the requirements of this Section.

2.2 ACCESSORIES

- .1 Back-up material:
 - .1 Unless indicated otherwise, extruded open cell polyethylene foam backer rod, oversized 30 to 50%.
 - .2 Primers: type recommended by sealant manufacturer.
 - .3 Joint cleaner: non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION OF JOINT SURFACES

- .1 Clean bonding joint surfaces of harmful matter substances including dust, paint, mortar and other matter which may impair work and dry joint surfaces.
- .2 Remove rust, scale and coatings from ferrous metal surfaces with metal brush, grinder or sand blasting.
- .3 Remove oil, grease stains and other coatings from non-ferrous metals with joint cleaner.
- .4 Prepare concrete, masonry and glazed surfaces in accordance with manufacturer's directions.
- .5 Prime joints in accordance with manufacturer's directions.
- .6 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants. Depth of joint to be half of joint width. Joint width to be minimum 6 mm and maximum 25 mm.
- .7 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .8 Ensure joint surfaces are dry and frost free.

3.2 PRIMER INSTALLATION

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.3 BACK-UP MATERIAL INSTALLATION

- .1 Install joint filler to achieve correct joint depth and shape to all joints.
- .2 Apply bond breaker tape to edge of asphalt impregnated board at floor joints.

3.4 SEALANT PREPARATION

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.5 SEALANT APPLICATION

- .1 Sealant:
 - .1 Apply sealant in accordance with manufacturer's instructions.
 - .2 Apply sealant in continuous beads.
 - .3 Apply sealant using gun with proper size nozzle.
 - .4 Use sufficient pressure to fill voids and joints solid.
 - .5 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
 - .6 Tool exposed surfaces to give slightly concave shape.
 - .7 Remove excess compound promptly as work progresses and upon completion.
- .2 Curing:
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.

- .2 Do not cover up sealants until proper curing has taken place.
- .3 Cleaning:
 - .1 Clean adjacent surfaces immediately and leave work neat and clean.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealant.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

- .1 Produits d'étanchéité section 07620

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-[06a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B29-[03], Standard Specification for Refined Lead.
 - .3 ASTM B749-[03], Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-[99], Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-[84], Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-[04]/G40.21-[04], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-[03], Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, [2000].
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, [1990].
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-[01], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S702-[97], Standard for Thermal Insulation, Mineral Fibre, for Buildings.
 - .3 CAN/ULC-S704-[03], Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .4 CAN4-S104-[M80], Standard Method for Fire Tests of Door Assemblies.
 - .5 CAN4-S105-[M85], Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data: in accordance with Section 01300 - Submittals.
- .3 Provide shop drawings: in accordance with Section 01300 – Submittals.
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province.
 - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, arrangement of hardware and finishes.
 - .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings.
 - .4 Submit test and engineering data, and installation instructions.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01600 Material and equipment .
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01710 – Cleaning

PART 2 - PRODUCTS

2.1 MATÉRIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.

2.2 DOOR CORE

- .1 Polyurethane core: modified polyisocyanurate rigid panels, closed cell foam, with a density of 32 kg / m³, depending CGSB 51-GP-21M.

2.3 ADHESIVES

- .1 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

2.4 PRIMER

- .1 Touch-up prime CAN/CGSB-1.181.

2.5 PAINT

- .1 Color code PS211G58 from ALRO. or equivalent approved by architect
- .2 Protect weatherstrips from paint.
- .3 Provide final finish free of scratches or other blemishes.

2.6 HARDWARE AND ACCESSORIES

- .1 Door closer with integrated stop and hold open, series LCN, #4041XP H CUSH from ALLEGION. Or equivalent approved by architect
- .2 Panic bar : #9827L-DT X 996L-DT-RV X finish 628, from Von Duprin, or equivalent approved by architect
- .3 Aluminum threshold, thermal break and stopper #ATP35 alloy 6063 T5 with vinyl trim, full width of bay, from "Unique architectural" or equivalent approved by the architect.
- .4 Broom holder #2100 alloy 6063 T5 with neoprene lining, full width of bay, from "Unique architectural" or equivalent approved by architect.
- .5 Stainless steel hinges STSBB991 FNA x 4.5 x 4 from "Charnière Montréal" or equivalent approved by the architect.
- .6 Aluminum weather stripping: alloy 6063 T5, with vinyl trim, the entire perimeter of the bay from "Unique architectural" or equivalent approved by architect.
 - .1 Model 17V at heading.
 - .2 Jamb: Model 1650.
- .7 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with

counter-sunk oval head sheet metal screws.

- .8 Glazing: Allow the installation of glazing, as indicated, and provide the required cover strips.
 - .1 Tempered and wired glass dimensions as recommended by Parks Canada.
 - .2 Glazing shall be retained by means of removable stainless steel cover strips for use with glazing tape and mastic and fixed with flat head stainless steel screws,
 - .3 External cover strips must be anti-intrusion type.
- .9 Metallic paste filler: to manufacturer's standard.
- .10 Barrel: With key, part of the key system according to Parks Canada instructions. ABLOY barrel to be provided by the contractor for keying to be done by the customer. Coordinate type of barrel and key path with customer before making the order.

2.7 FRAMES FABRICATION GENERAL

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6 mm welded, thermally broken type construction.
- .4 Blank, reinforce, drill and tap frames for mortised, templated hardware, using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .5 **Protect mortised cutouts with steel guard boxes.**
- .6 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .7 Manufacturer's nameplates on frames and screens are not permitted.
- .8 Conceal fastenings except where exposed fastenings are indicated.
- .9 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

- .10 Insulate exterior frame components with polyurethane insulation.

2.8 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors minimum for each rebate
- .4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.
- .5 The frame parts to be accurately assembled and securely welded to each other, with welding on the inner wall of the profiles.
- .6 Butt joints between the elements must be accurately profiled.
- .7 Floor anchorages must be securely fastened inside each of the profiles.
- .8 Two temporary spacers are to be welded to each of the frames to keep them free during transport.

2.9 FRAMES: WELDED TYPE

- .1 Welding in accordance with CSA W59.
- 2. Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

- .7 Fabricate frame products for openings [___] in sections, [___] x [___] mm, splice joints for field assembly.
- .8 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.

2.10 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Fabricate doors with longitudinal edges locked seamed, adhesive assisted. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .3 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E330 to provide blast.
- .4 Blank, reinforce, drill doors and tap for mortised, templated hardware.
- .5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation
- .6 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .7 Manufacturer's nameplates on doors are not permitted

2.11 THERMALLY BROKEN DOORS AND FRAMES

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION- GENERAL

- .1 Install doors and frames to CSDMA Installation Guide.

3.3 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Sealant color related to the color of the door prescribed in this section.
- .7 Maintain continuity of air barrier.

3.4 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.
- .2 Adjust operable parts for correct function.

3.5 FINISH REPAIRS

- .1 Touch up with primer finishes damaged during installation.

- .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

END OF SECTION

PART 1 – GÉNÉRAL

1.1 RELATED WORK

- .1 Structural steel and steel decks..... section 05120

1.1. CONSTRUCTION REQUIREMENTS

- .1 Design doors to withstand wind load of 21 psf (velocity of 90.5 miles/hour) with a maximum horizontal deflection of 1/120 of opening width
- .2 Closed tubular aluminum extrusions
- .3 Male-female tongue-and-groove joint

1.2. SHOP DRAWINGS

- .1 Supply shop drawings in accordance with plans and specifications for approval. Contractor shall be responsible for job site dimensions before fabrication and co-ordination with others sub-trades.

1.3. MAINTENANCE INSTRUCTIONS

- .1 Supply maintenance instructions for hardware and/or others components in accordance section 01300.

1.4. WARRANTY

- .1 The doors and hardware must carry a warranty of one (1) year against any defect or faulty workmanship. The door panels must carry a ten (10) year limited warranty against perforation due to rusting, and a five (5) year limited warranty on delamination, under normal operational conditions.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Commercial anodised 16GA aluminium sheet
- .2 Commercial mill finish 16GA aluminium sheet
- .3 Commercial anodised 6063 T5 aluminium extrusions
- .4 Anodized finish:
 - .1 clear : to meet AAM12C22A31 standard

.2 color : to meet AAM12C22A34 standard.

2.2 REFERENCE PRODUCT:

.1 insulated filled panels, #AL-2000 with " mark II " panels, white without windows, Thermostop. Or equivalent approved by the architect.

2.3 PEDESTRIAN DOOR

.1 Must be without glazing, 915mm wide, within the construction of the garage door, see plans for opening direction and side of the door.

.2 All hardware and pedestrian door accessories must be from the garage door manufacturer. And installed as recommended by the garage door manufacturer.

.3 Barrel: key part of the key system according to the instructions of Parks Canada. ABLOY barrel to be provided by the contractor for keying to be done by the customer. Coordinate type of barrel and key path with the customer before making the order.

2.4 MANUFACTURING PROCESS

.1 All tubular extrusions are assembled by means of full-length through bolts. Welding shall not be permitted in any part of the process.

2.5 JOINT AND SEAL

.1 High quality galvanized steel or aluminum skins roll formed into an exclusive tongue-and-groove joint equipped with a foam weather seal.

2.6 EXTRUSIONS DIMENSIONS

.1 Dimensions according to manufacturer's recommendations for: intermediate vertical mullion, end vertical rail, top horizontal rail, bottom horizontal rail, male horizontal rail, female horizontal rail.

2.7 FINISH

.1 Refer to painting section 0990.

2.8 REINFORCEMENT

.1 When required, the horizontal members shall be adequately reinforced

with integral reinforcing fins and aluminum "T" struts. No steel reinforcing struts shall be permitted.

2.9 PERIMETER WEATHER SEAL

- .1 triple-lip, flexible PVC weather seal, retained in an extra robust extruded aluminum retainer.

2.10 BOTTOM WEATHER SEAL

- .1 U-shaped, flexible PVC weather seal, retained in a heavy duty extruded aluminum retainer, securely fastened to the bottom of the door.

2.11 HARDWARE

- .1 Follow manufacturer's recommendations for required model for 10 000 cycles springs

2.12 ELECTRICAL OPERATOR AND ACCESSORIES

- .1 The door must be equipped to operate with a chain hoist, and an electric operator.
- .2 Electric operator: Trolley truck type central Motor and / or Jackshaft type side engine.
- .3 Follow manufacturer's recommendations for required model for 10 000 cycles springs
- .4 Follow manufacturer's recommendations for electric accessories and their activation systems such as push buttons, remote controls, magnetic loop detector, security border, switch, adjustable timer or closing timer if required.

2.13 DOOR FRAME

- .1 Refer to section 05120.

PART 3 - EXECUTION

- .1 Install doors and associated hardware in accordance with manufacturer's instructions.

- .2 If necessary, touch up the steel elements with primer to areas where the finish has been damaged during assembly.
- .3 Install electrical motors, control devices, control stations push buttons, relays and other electrical equipment needed for the operation of the door.
- .4 Lubricate springs and adjust the moving parts so that the doors operate smoothly.
- .5 Adjust weather stripping so as to achieve a good seal to the weather.

END OF SECTION

PART 1 - GÉNÉRAL

1.1 RELATED WORK

- .1 Structural steel and steel decks..... section 05120
- .2 Metal fabrications..... section 05500

1.2 SCOPE OF WORK

- .1 Work included: supply all materials, tools, labour and supervision required to perform the painting of all new exposed surfaces as well as existing patched surfaces where required :
 - metal fabrications and exposed steel surfaces.

1.3 STORAGE AND HANDLING

- .1 Store materials in room assigned by construction manager. Maintain storage room clean and in good order. Materials to be pre-mixed and delivered on site in original containers; labels and seals must be intact. Label must indicate type of paint, colour and manufacturer's name as well as other instructions concerning mixing, dilution and application.

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 Do not apply paint finish in areas where dust is being generated.
- .2 Protect all fixtures, equipment, furniture, plumbing fixtures and piping having a permanent finish from paint stains and droppings. Remove all surface mounted finish hardware as well as switch and wall socket cover plates during painting work.

1.5 SAMPLES

- .1 Perform all paint and colour mock-ups deemed necessary to obtain the desired effects.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Qualified products: where paint material is specified by a standard, only paint materials listed on the CGSB Qualified Products List are acceptable for use.

- .2 Paint materials: to CGSB Standards or specific products listed in Finishing Formulae.
- .3 Paint materials for each coating formulae to be products of a single manufacturer.

PART 3 - EXECUTION

3.1 APPLICATION

- .1 All surfaces must be solid, dry, clean, free of dirt, dust, grease, oil, rust and all foreign matter liable to compromise the appearance or adhesion of the paint systems.
- .2 Do not begin painting work before having inspected all surfaces to be painted and having received the Architect's approval.
- .3 Beginning of work implies acceptance of application surfaces.
- .4 Touch up shop paint primer on steel with CGSB 1-GP-40M to CGSB 85-GP-14M.
- .5 Prepare galvanized steel and zinc coated surfaces to CGSB 85-GP-16M.
- .6 All damaged surfaces must be repaired before painting; all surfaces must be free of foreign matter, dirt, stains, grease or any other material impeding proper paint adhesion. Remove all manufacturer's brand names that may still be in place.

3.2 PROTECTION

- .1 Protect all adjacent surfaces from paint and varnish splashes, drippings and stains.
- .2 Carefully mask-off all mechanical and electrical equipment and fixtures, glazing and finish hardware, as well as all surfaces that do not require painting.

3.3 APPLICATION, GENERAL

- .1 Materials must be applied by competent tradesmen, in strictly in accordance with manufacturers' printed instructions. Paint finishes must be uniform in gloss, colour, texture, free of brush or roller streaks, sagging, drips and other defects affecting appearance or durability.
- .2 No exterior painting work shall be performed when ambient temperature is below 10°C or when raining or about to. Maintain

minimum 15°C interior temperature and provide adequate ventilation for interior painting work.

- .3 Properly mix paints to uniform consistency. Apply paint uniformly, using roller, free of drips, smears, oversights, substrate telegraphing or other defects to obtain specified texture, finish and colour.
- .4 Minimum dry film thickness for each paint coat shall be as recommended by manufacturer.
- .5 Sand and dust between each coat to remove defects visible from 1.0 m away.

3.4 METAL FABRICATIONS

- .1 Paint system for metal surface (trusses, columns and braces):
 - .1 One coat of Interzinc 52 TDS primer and 2 coats of Interseal 670 HS finish, as manufactured by International.

3.5 FINISHING AND CLEANING

- .1 Touch-ups: all paint work judged unacceptable by the engineer shall be touched-up or redone to his satisfaction.
- .2 Cleaning: at work's end, clean all surfaces that have not been painted (floors, walls, hardware, equipment or accessories) carefully removing all paint stain.

END OF SECTION