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Region Project	TITLE SHEET	Page 1
Number CCIW-004-J2959		2014-05-15

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Project Title      Metal Cladding Replacement  
Canada Centre for Inland Waters  
Burlington, Ontario

Issued for Tender

Project Number      CCIW-004-J2959

Project Date      2014-05-15

END OF SECTION

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Structural Engineer:

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END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

- .1 Accept instructions only from the Department Representative and/or sources designated by the Project Manager.
- .2 The building shall remain in use in areas not immediately affected by the work. Ensure that normal building operations and maintenance may be carried out without disruption, except as otherwise noted herein or stated in the Bid.
- .3 Work shall be allowed only from 7:00a.m. to 6:00p.m., Monday to Friday. The work shall be performed according to the start date and duration given in the Bid Document.

1.2 Protection of Work, Property and Persons

- .1 Supply, install and maintain a temporary 6 foot high fence construction barrier around work area.
- .2 Maintain all emergency and service access routes clear at all times. Provide barricades and signs necessary to direct vehicular and pedestrian traffic around construction areas at all times.
- .3 Before commencing work, identify all paths for dust, fumes or odours generated by the work to penetrate interior spaces. These shall include make-up air intakes, ventilation/exhaust openings for service rooms such as generator or hydro vault rooms, doors, windows, and pipe or cable penetrations. Take measures such as enclosing, sealing and/or providing sustained negative pressure to prevent dust, fume or odour ingress. If required, coordinate temporary shut-down of mechanical equipment by Department Representative.
- .4 Be responsible for damage caused or clean-up required by dispersion of dust generated by the work.
- .5 Before commencing work, inspect all building components, including drains, lights, windows, screens, doors, etc. within the area of the work. Submit a written list if there is existing damage, or items not functioning.
- .6 Receive, be responsible for, and promptly arrange all details of compensation for all damage existing after the work which was not recorded prior to the work. Unless dealt with promptly by the Contractor, the Contractor will be responsible for costs for time of Department Representative's or Consultant's personnel and other costs incurred for claims not handled by the Contractor. This includes costs for correction of

deficiencies paid for by the Department Representative.

- .7 The Contractor shall assume all responsibility for any damage resulting from the use of the building's drainage system to dispose of construction water irrespective of the drain system condition.
- .8 Ensure the building envelope affected by the work is made water-tight prior to adverse weather, and at the end of each day, to prevent interior leakage.

1.3 Progress of Work and Schedule

- .1 Monitor compliance with the contract schedule on an ongoing basis.
- .2 At no time shall the size of the work crew be decreased from the size indicated on the project schedule.
- .3 If unit price items increase by more than 30%, or should unusual weather or other unforeseen conditions affect the project schedule, submit a revised schedule to reflect approved changes to the project schedule.
- .4 If the Department Representative, at any time, considers the number of workers, equipment or materials to be insufficient to maintain the Contract schedule, the Department Representative, through the Consultant, may, in writing, order the Contractor to work weekends/and or additional hours or provide additional workers, equipment, or materials as the Department Representative and Consultant may think necessary and in such longer period as may be fixed by any such order at no additional cost to the Department Representative in order that the Work be performed according to the terms of the Contract. Should the Contractor fail to comply with the order, the Contractor shall be considered to be in default of the Contract.
- .5 Should the Contractor fail to meet the project schedule as a result of conditions under their control, the Department Representative reserves the right to deduct costs for additional time required by the Consultant from amounts owed to the Contractor.
- .6 Where temperature sensitive work must take place and environmental conditions are not likely to be within the specified limits, and where it is not feasible to provide heat (as agreed to by the Contractor and Department Representative), and where the Manufacturer has provided the Contractor with approval to proceed with the work, proceed only with written authorization from the Consultant. At least five days before the work is to take place, submit Manufacturer's written instructions to the Consultant. The Manufacturer's written instructions must include the revised

environmental condition limits, details of required modifications to products or application procedures, and risks associated with proceeding under the revised conditions. All such changes must be authorized by the Department Representative.

1.4 Project Supervision and Coordination

- .1 Ensure that a qualified foreman, capable of communicating effectively in the English language, familiar with the requirements of these specifications, is on site at all times, including during subcontractors' activities.
- .2 Be aware that the breakdown of the specification into sections does not represent any actual division of the work. Be responsible for coordination between items of work which would be covered under separate specification sections. Coordinate and be responsible for the work of the various sub-trades.
- .3 Take reasonable measures to control noise, dust, smoke, and odours during construction. Control execution of all work to minimize interference of occupants' use of the building. Be responsible for workers' activities while on the site.
- .4 Conform to all By-Laws and all Legislated requirements including those related to labour, noise and the environment.
- .5 Maintain at the job site one copy, including all amendments, of each of the following:
  - .1 Contract drawings and specifications
  - .2 Site Visit Reports issued by Consultant
  - .3 Additional Drawings issued by Consultant
  - .4 Contemplated Change Orders and Change Orders
  - .5 Material Test Reports
  - .6 Accurate daily records of all work performed, weather and labour force
  - .7 Manufacturer's specifications for all products to be used
  - .8 Proof of WHMIS training for all site personnel
  - .9 Product data sheets to meet the WHMIS requirements
  - .10 Occupational Health and Safety Act and Site Specific Safety Plan
- .6 Notify all staff and sub-contractors that the Contractor is entirely responsible for site safety. No actions or lack of action by the Department Representative or Consultant shall be deemed to be an instruction related to safety of the workplace.
- .7 Drawings are, in part, diagrammatic and are intended to convey the scope of work and indicate general and approximate locations and arrangement of work. Obtain

more accurate information about locations, arrangements and sizes from actual conditions on site.

- .8 When site conditions require reasonable changes to the drawings, obtain the Consultant's approval prior to making such changes.

1.5 Applicable Laws, Regulations and Standards

- .1 Perform all work in accordance with National Building Code of Canada requirements and local and municipal by-laws.
- .2 All Standards referred to shall be the current editions as amended at the date of issue of Contract Documents.
- .3 The Contractor is responsible for obtaining and paying for all building permits, street permits, power line protection, damage deposits, etc., as required.
- .4 The Contractor is responsible for notifying the proper municipal inspector in advance (as specified by the inspector) to complete review of any project component the local municipal authority requires. Ensuring that correct municipal reviews are completed shall be solely the Contractor's responsibility. Additional work to expose or re-do uninspected work shall be completed by the Contractor at their expense.

1.6 SUBSTITUTIONS

- .1 Submit in writing, using the Request for Substitution form approved by the Consultant, any requests for substitutions to materials and/or installations specified and/or stated in the bid documents, at least ten working days prior to the intended application.
- .2 Submit information regarding the proposed substitution, including the reason for the change, the benefit to the Department Representative, manufacturer data sheets, independent test reports, performance differences compared with the specifications, and the amount of credit offered.
- .3 Should the number of Requests for Substitutions be unreasonable, the Consultant may refuse to consider further requests unless the Contractor agrees to pay for the Consultant's evaluation. The agreed fee will be deducted by the Department Representative from the amounts owed to the Contractor and paid to the Consultant.

1.7 PROJECT MEETINGS

- .1 At least one week prior to start of work, attend a meeting between the Consultant, Department Representative the Contractor's Project Manager and Site Superintendent to discuss the work.
- .2 Attend regular site meetings with the Consultant and Department Representative at a mutually agreeable time

for the discussion of progress of the work and to resolve any difficulties.

1.8 QUALITY ASSURANCE

- .1 Make all measurements required to perform the work. Determine site dimensions and levels so that all new work is installed to correct sizes.
- .2 Maintain all work completed or in progress in its condition as accepted.
- .3 All work shall meet or exceed the more stringent of the manufacturer's requirements or the requirements of this Specification.

1.9 CONSTRUCTION REVIEW

- .1 The Contractor shall notify the Consultant and inspection and testing agents not less than 48 hours prior to each part of work being ready for review or testing. Work which requires review or testing shall not be performed on weekends or holidays unless previously agreed to.
- .2 The Contractor shall be responsible for payment of costs if the work is not ready when stated and if the Consultant and inspection and testing agency are not given sufficient notice of such delay.
- .3 The Department Representative reserves the right to deduct from the Contractor amounts for extra inspection and testing by the Consultant as required for certification of payment of work done to repair a deficiency.

1.10 TEMPORARY FACILITIES

- .1 Provide a means of direct communication with the site to permit continuous contact on a daily basis.
- .2 Provide temporary sanitary facilities and maintain in a sanitary condition. Site facilities shall not be used by the Contractor's forces.
- .3 Temporary electrical power for hand held equipment will be provided free of charge by the Department Representative. Arrange and pay for any usage and connection costs required for all other equipment. Do not connect to the building's power supply without written permission of building management.
- .4 The existing water supply from existing hose bibs at the site may be used free of charge. Any water required in excess of this supply shall be metered and paid for by the Contractor. Be responsible for connecting to the existing services. Do not use fire system without written permission of building management. Advise Building Operations/Property Management of any procedures that may cause fire alarms to activate.

- .5 With the exception of safety/instruction signs and notices, no signs or advertising shall be permitted on the site or equipment except as authorized by the Department Representative. Safety/instruction signs and notices shall be posted in accordance with current Code requirements and local and municipal by-laws. Maintain approved signs and notices in good condition for duration of work.

1.11 MATERIALS AND EQUIPMENT

- .1 Deliver all materials to the site in their original unopened containers, with labels intact. Where applicable, check material expiry dates. Immediately dispose of all materials older than their expiration date away from the site.
- .2 Store all materials and equipment in accordance with manufacturer's written requirements, and in a dry, secure and protected manner which will not overload the structure and shall prevent vandalism or unauthorized use. Storage locations shall be approved in advance by the Department Representative.
- .3 Be responsible for the security of all materials and equipment. Make no claims for theft or damage to the Department Representative.
- .4 Non-specified materials shall not be brought to site. Remove any non-specified materials from site within 24 hours upon request by the Department Representative.

1.12 WASTE MANAGEMENT

- .1 Unless otherwise specified, salvaged material resulting from the Construction shall become the property of the Contractor who must dispose of it away from the site in a timely manner. Storage locations shall be approved in advance by the Department Representative.
- .2 Separate recyclable and toxic waste materials from the waste stream. Deliver to a local waste management facility.

1.13 DEFICIENCIES

- .1 For any deficiencies in the work, the Contractor shall submit a written proposal for the repair of the deficiency. If engineering design is required bring into attention of the project design Consultant. All testing required shall be paid for by the Contractor.

1.14 PROJECT CLOSEOUT

- .1 Flush clear all drains affected by the work.
- .2 Clean site of all materials and debris created by the Construction. Power wash all ceilings, walls and floors adjacent to the work of dust and materials generated during the work. Remove all caulking, paints, cementitious material or the like from windows. Damaged or scratched windows must be replaced at the

Contractor's cost.

- .3 Submit written acceptance that utility companies have inspected services to their satisfaction.
- .4 Attend a final walk-through with the Department Representative and Consultant. The Consultant will record identified incomplete and deficient work on a punchlist.
- .5 Make good all known deficiencies in the work.
- .6 Notify Consultant of readiness for final inspection only after completion of these items.
- .7 The Consultant will review completion of punchlist items during one review. Additional reviews required to check un-rectified deficiencies or work that remains incomplete will be charged back to the Contractor. These charges will be deducted by the Department Representative from the Contractor's progress payments and paid from those funds to the Consultant.

#### 1.15 EMERGENCIAS

- .1 In an emergency affecting or threatening the safety of life, the work or adjoining property, the Department Representative and Consultant have authority to stop the progress of the work.
- .2 Provide the Department Representative and Consultant with the name and telephone number of a person that is available and may be contacted during off hours, weekends and holidays in case of emergency.

#### 1.16 CASH ALLOWANCES

- .1 Expend cash allowances only on written instructions from the Consultant.
- .2 Include in each expenditure from cash allowances applicable taxes as specified in the General Conditions of the Contract.
- .3 Payment shall be made only for actual charges and only at the rate for work performed during normal business hours. No overhead or profit for the Contractor will be included in these amounts. Charges for stand by time or non-productive visits caused by the Contractor or the Contractors' forces will be the Contractors' responsibility.
- .4 Cash allowances for permits shall be used only for the cost of the permit. All other costs associated with obtaining any permit shall be included elsewhere.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Title and description of Work.
- .2 Contract Method.
- .3 Work by others.
- .4 Future work.
- .5 Work sequence.
- .6 Contractor use of premises.
- .7 Owner occupancy.
- .8 Partial Owner occupancy.
- .9 Pre-ordered products.
- .10 Owner furnished items.
- .11 Alterations to existing building.
- .12 Mobilization/Demobilization
- .13 Remove existing outer metal cladding.
- .14 Cladding assembly repairs.
- .15 Metal panel replacement.
- .16 Metal louver replacement.
- .17 Painting steel.
- .18 Access Doors.
- .19 Mechanical and electrical work.

1.2 PRECEDENCE

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

1.3 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

#### 1.4 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises of replacement of the exterior metal cladding system at the mechanical penthouse, service corridor, boiler room and three overhead doors, located at The Canada Centre for Inland Waters.

#### 1.5 CONTRACT METHOD

- .1 Construct Work under lump sum contract.
- .2 Relations and responsibilities between Contractor and subcontractors assigned by Owner are as defined in Conditions of Contract. Assigned Subcontractors must, in addition:
  - .1 Furnish to Contractor bonds covering faithful performance of subcontracted work and payment of obligations thereunder when Contractor is required to furnish such bonds to Departmental Representative.
  - .2 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide to Departmental Representative.

#### 1.6 COST BREAKDOWN

- .1 Within 48 hours of notification of acceptance of bid furnish a cost breakdown by Section aggregating contract amount.
- .2 Show separately cost of equipment purchased exempt from Ontario Retail Sales Tax under your Ontario Sales Tax licence number.
- .3 Within 48 hours of acceptance of bid submit a list of subcontractors.

#### 1.7 WORK BY OTHERS

- .1 Work of Project executed during Work of this Contract, and which is specifically excluded from this Contract:
  - .1 Coordinate with the base building mechanical equipment service trades for the temporary shut-off of the mechanical equipment, as required to perform the work (e.g. at the louvers). Confirm that the equipment is restarted and functioning properly.
- .2 The Contractor shall for the purpose of the Ontario Occupational Health and Safety Act and Regulations for Construction Projects, and for the duration of the Work of the Contract:
  - .1 Assume the role of Constructor in accordance with the Authority Having Jurisdictions.
  - .2 Agree, in the event of two or more Contractors working at the same time and space at the work site, without limiting the General Conditions GC3.7, to the Departmental Representative's order to:
    - .1 Assume, as the Constructor, the responsibility for the Departmental Representative's other Contractors; [or]
    - .2 Accept the Departmental Representative's other Contractor's role as Constructor and conform to that Contractor's Site Specific Health and Safety Plan.

### 1.8 FUTURE WORK

- .1 Not Used.

### 1.9 WORK SEQUENCE

- .1 Construct Work in stages to accommodate Owner's continued use of premises during construction.
- .2 Coordinate Progress Schedule and coordinate with Owner Occupancy during construction.
- .3 Required stages:
  - .1 When working inside the mechanical room and boiler rooms.
- .4 Maintain fire access/control.

### 1.10 CONTRACTOR USE OF PREMISES

- .1 Contractor has unrestricted use of site until Substantial Performance.
- .2 Coordinate use of premises under direction of Departmental Representative.
- .3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

### 1.11 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

### 1.12 PARTIAL OWNER OCCUPANCY

- .1 Not Used.

### 1.13 PRE-ORDERED PRODUCTS

- .1 Not Used.

### 1.14 PRE-PURCHASED EQUIPMENT

- .1 Not Used.

#### 1.15 OWNER FURNISHED ITEMS

- .1 Not Used.

#### 1.16 ALTERATIONS TO EXISTING BUILDING

- .1 Not Used.

#### 1.17 MOBILIZATION/DEMobilIZATION

.1 Mobilize all labour, equipment, and products necessary to carry out the work of this contract. This shall include all related equipment, safety supervision, engineering, etc. Take necessary precautions to protect the roof system in the work area from puncture, tears, penetrations or any other damage during the work.

.2 Supply, install, and maintain throughout the course of the work, all necessary temporary protective barriers, signage, and protection to redirect pedestrian and vehicular traffic.

.3 Catalogue (by written and photographic record) all site deficiencies (hard and soft surfaces) at areas not being repaired or replaced by the work prior to the start of work.

.4 Upon completion of work, demobilize all equipment, and clean the site of debris, dirt, laitance, and staining caused by the work.

.5 Protect the existing roofing during the work. The Contractor is responsible for retaining the base building roof Contractor (see Para. 2.3.6) to repair all damage caused by the work at no cost to the Department Representative.

.6 Ensure the building envelope affected by the work is made water-tight prior to adverse weather, and at the end of each day, to prevent interior leakage.

#### 1.18 REMOVE EXISTING OUTER METAL CLADDING

.1 Remove and dispose of the exterior metal panel identified for replacement on the drawings. Removal of the panels is to include the existing sheet metal locking strip and cap flashing at the top of wall, sheet metal trims and drip deflectors.

The portion of the service corridor running in the east-west direction at the south end of the mechanical penthouse has white vertical metal siding secured to the original metal panels. Include removing both layers of metal at these locations.

#### 1.19 CLADDING ASSEMBLY REPAIRS

.1 Remove and dispose of existing glass-batt insulation in the back pan and replace with new 50mm thick mineral fiber insulation.

.2 Notify the Consultant for review of existing Z-girts; Z-girts in sound

condition are to remain in place unless otherwise directed by the Consultant.

.3 Provide new supplemental Z-girts as required by Engineered Shop drawings and Specification Section 07 46 19.00. Locally replace Z-girts as required. Confirm locations with the Consultant.

.4 Provide new spray foam air seal at the joint between panels in the galvanized liner/pan system and at the base of wall as required and shown by drawing PD-1, PD-2, and PD-4.

.5 Provide new building wrap layer (spun polyolefin) between the existing Z-girt and new metal cladding. Tape and secure building wrap at all joints, seams and penetrations.

.6 Incorporate a new membrane flashing to tie the new roof membrane into the wall panel system as shown on Drawing PD-2. The existing roofing membrane is still covered under warranty. The Contractor is responsible for directly retaining the building's roofer as follows to maintain the warranty:

Flynn Canada Ltd.  
Joseph Raposa, Manager - Sales & Estimating  
Hamilton/Kitchener Branches  
Tel: 905-643-9515 ext. 1558  
Cell: 905-308-5943  
E-mail: jraposa@flynn.ca

Only materials compatible with the current system installed are allowed such that the existing warranty is not compromised. The Existing remaining warranty on the roof is 13 years.

## 1.20 METAL PANEL REPLACEMENT

.1 Submit engineered shop drawings detailing the cladding system, including dimensions, location of joints, profiles of the outer skin, types and locations of supports, fasteners, flashing, closures and all metal components related to the cladding installation.

Drawings shall be signed and sealed by a Professional Engineer licensed in the Province of Ontario, attesting to the ability of the metal panels assembly to withstand the specified loads.

.2 Provide new sheet metal locking strip and cap flashing at all areas of the work as required by Specification Section 07 62 00.03 and as shown on Detail PD-3.

## 1.21 METAL LOUVER REPLACEMENT

.1 Remove all existing louvers within the work area. Supply and install new metal louvers to match the existing dimensions and operation. Re-use the existing opening. The new louvers are to incorporate integrated bird deterrent screens and wind tested design. Submit engineered shop drawings of the new louvers and framing details for the Consultants review.

.2 Detail all louvers, pipe penetrations, conduit penetrations, access ladders, doors, and miscellaneous equipment as indicated on the drawings. The Contractor will be responsible to review and confirm all penetration

locations and accessory securement and temporary disconnection and re-connection of the equipment which is mounted on the metal cladding. Complete fire stopping details at all penetrations and intersections with other cladding assemblies in accordance with the detail and manufacturer's written instructions. Arrange for site review by manufacturer prior to installation.

#### 1.22 PAINTING STEEL

- .1 Remove roof access ladder at the north end of the mechanical pent house, clean, prime and paint as per Specification Section 09 97 19. Re-secure access ladder to the existing structural steel members.
- .2 Clean, prime and paint overhead doors A, B and C as per Specification Section 09 97 19.
- .3 Clean, prime and paint man doors A, B and C as per Specification Section 09 97 19.

#### 1.23 ACCESS DOORS

- .1 Provide new access doors clad with metal panel system at the locations shown on the drawing. Provide shop drawing of new doors for Consultant review.

#### 1.24 MECHANICAL AND ELECTRICAL WORK

- .1 The Contractor is to engage a Mechanical and Electrical contractor for Disconnection/Reconnection. Complete mechanical and electrical equipment disconnection and reconnection as required to facilitate the work.

### PART 2 - PRODUCTS

#### 2.1 NOT USED

- .1 Not used.

### PART 3 - EXECUTION

#### 3.1 NOT USED

- .1 Not used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 ACCESS AND EGRESS

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

### 1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Departmental Representative will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.
- .5 Use only elevators existing in building for moving workers and material.
  - .1 Protect walls of passenger elevators, to approval of Departmental Representative prior to use.
  - .2 Accept liability for damage, safety of equipment and overloading of existing equipment.
- .6 Closures: protect work temporarily until permanent enclosures are completed.

### 1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

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

### 1.4 EXISTING SERVICES

- .1 Notify, Departmental Representative utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours

of occupants, preferably on weekends.

- .3 Provide for pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00.

## 1.5 SPECIAL REQUIREMENTS

- .1 Carry out noise generating Work Monday to Friday from 09:00 to 17:00 hours.
- .2 Submit schedule in accordance with Section 01 32 15 - Construction Progress Schedule - Critical Path Method (CPM) and 01 32 16 - Construction Progress Schedule - Bar (GANNT) Chart.
- .3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.

## 1.6 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.
- .2 Security clearances:
  - .1 Personnel employed on this project will be subject to security check. Obtain clearance, as instructed, for each individual who will require to enter premises.
  - .2 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.

## 1.7 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions. Smoking is not permitted.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Cash allowances.

### 1.2 REFERENCES

- .1 Project Supplementary Conditions

### 1.3 CASH ALLOWANCES

- .1 Include in Contract Amount, cash allowances stated herein.
- .2 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage and other authorized expenses incurred in performing Work.
- .3 Contract Amount, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.
- .4 Contract Amount will be adjusted by written order to provide for an excess or deficit to each cash allowance.
- .5 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in Contract Documents.
- .6 Progress payments on accounts of work authorized under cash allowances shall be included in Departmental Representative's monthly certificate for payment.
- .7 Schedule shall be prepared jointly by Departmental Representative and Contractor to show when items called for under cash allowances must be authorized by Departmental Representative for ordering purposes so that progress of Work will not be delayed.
- .8 Amount of each allowance, for Work specified in respective specification Sections is as follows:
  - .1 Section 01 11 00 include an allowance of \$ 4,000.00 for Electrical and Mechanical work for the disconnection and connection of building systems using base building maintenance contractor.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Coordination Work with other contractors under administration of Departmental Representative.
- .2 Scheduled preconstruction, progress and closeout meetings.

### 1.2 RELATED SECTIONS

- .1 Section 01 11 00 - Summary of Work.
- .2 Section 01 91 00 - Commissioning - General Requirements.

### 1.3 DESCRIPTION

- .1 Coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities and construction Work, with progress of Work of other contractors, under instructions of Departmental Representative.

### 1.4 PROJECT MEETINGS

- .1 Schedule and administer bi-weekly project meetings throughout progress of Work as determined by Departmental Representative.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record minutes. Include significant proceedings and decisions. Identify action by parties.
- .7 Reproduce and distribute copies of minutes within three days after each meeting and transmit to meeting participants, affected parties not in attendance and Departmental Representative.

### 1.5 CONSTRUCTION ORGANIZATION AND START-UP

- .1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Senior representatives of the Departmental Representative, Contractor, major Subcontractors and field inspectors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Agenda to include following:
  - .1 Appointment of official representative of participants in Work.
  - .2 Schedule of Work, progress scheduling in accordance with Section 01 32 16.
  - .3 Schedule of submission of shop drawings, samples, colour chips in accordance with Section 01 33 00.
  - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 51 00.
  - .5 Delivery schedule of specified equipment in accordance with Section 01 32 00.
  - .6 Site security in accordance with Section 01 52 00.
  - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements (GC).
  - .8 Departmental Representative provided Products.
  - .9 Record drawings in accordance with Section 01 78 00.
  - .10 Maintenance in accordance with Section 01 78 00.
  - .11 Commissioning in accordance with Section 01 91 00.
  - .12 Take-over procedures, acceptance, and warranties in accordance with Section 01 77 00 and 01 78 00.
  - .13 Monthly progress claims, administrative procedures, photographs, and holdbacks (GC).
  - .14 Appointment of inspection and testing agencies or firms in accordance with Section 01 45 00.
  - .15 Insurances and transcript of policies (GC).
- .5 Comply with Departmental Representative's allocation of mobilization areas of site; for field offices and sheds, access, traffic, and parking facilities.
- .6 During construction coordinate use of site and facilities through Departmental Representative's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.
- .7 Comply with instructions of Departmental Representative for use of temporary utilities and construction facilities.
- .8 Coordinate field engineering and layout work with Departmental Representative.

### 1.6 ON-SITE DOCUMENTS

- .1 Maintain at job site, one copy each of the following:

- .1 Contract drawings.
- .2 Specifications.
- .3 Amendments.
- .4 Reviewed shop drawings.
- .5 Change orders.
- .6 Other modifications to Contract.
- .7 Field test reports.
- .8 Copy of approved Work schedule.
- .9 Manufacturers' installation and application instructions.
- .10 Labour conditions and wage schedules.
- .11 Material Safety Data Sheets.
- .12 Labour and Material Bonds.
- .13 All applicable Municipal Permits.

### 1.7 SCHEDULES

- .1 Submit preliminary construction progress schedule in accordance with Section 01 32 00 and Commissioning Schedule in accordance with Section 01 91 00 to Departmental Representative coordinated with Departmental Representative's project schedule.
- .2 After review, revise and resubmit schedule to comply with revised project schedule.
- .3 During progress of Work revise and resubmit as directed by Departmental Representative.

### 1.8 CONSTRUCTION PROGRESS MEETINGS

- .1 During course of Work and two weeks prior to project completion, schedule progress meetings.
- .2 Schedule separate commissioning meetings in accordance with Section 01 91 00.
- .3 Contractor, major subcontractors involved in Work and Departmental Representative are to be in attendance.
- .4 Notify parties minimum seven days prior to meetings.
- .5 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three days after meeting.
- .6 Agenda to include following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.

- .11 Review proposed changes for affect on construction schedule and on completion date.
- .12 Other business.

## 1.9 SUBMITTALS

- .1 Make submittal to Departmental Representative for review.
- .2 Submit preliminary shop drawings, product data and samples in accordance with Section 01 33 00 and 01 91 00 for review for compliance with Contract Documents; for field dimensions and clearances, for relation to available space, and for relation to Work of other contracts. After review, revise and resubmit for transmittal to Departmental Representative.
- .3 Submit requests for payment for review, and for transmittal to Departmental Representative.
- .4 Submit requests for interpretation of Contract Documents, and obtain instructions through Departmental Representative.
- .5 Process substitutions through Departmental Representative.
- .6 Process change orders through Departmental Representative.
- .7 Deliver closeout submittals for review and preliminary inspections, for transmittal to Departmental Representative.

## 1.10 COORDINATION DRAWINGS

- .1 Provide information required by Departmental Representative for preparation of coordination drawings.
- .2 Review and approve revised drawings for submittal to Departmental Representative.

## 1.11 CLOSEOUT PROCEDURES

- .1 Notify Departmental Representative when Work is considered ready for Substantial Performance.
- .2 Accompany Departmental Representative on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Departmental Representative's instructions for correction of items of Work listed in executed certificate of Substantial Performance.
- .4 Notify Departmental Representative of instructions for completion of items of Work determined in Departmental Representative's final inspection.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting 4 days in advance of meeting date to Departmental Representative.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within three days after meetings and transmit to Departmental Representative, meeting participants and affected parties not in attendance.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

### 1.2 PRECONSTRUCTION MEETING

- .1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Departmental Representative, Contractor, major Subcontractors, field inspectors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
  - .1 Appointment of official representative of participants in the Work.
  - .2 Schedule of Work: in accordance with Section 01 32 15 and 01 32 16.
  - .3 Schedule of submission of shop drawings, samples, mock-ups, colour chips. Submit submittals in accordance with Section 01 33 00.
  - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00.

- .5 Delivery schedule of specified equipment.
- .6 Site security in accordance with Section 01 56 00.
- .7 Health and safety in accordance with Section 01 35 29.06.
- .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
- .8 Owner provided products.
- .9 Record drawings and specifications in accordance with Section 01 33 00.
- .10 Maintenance manuals in accordance with Section 01 78 00.
- .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00.
- .12 Monthly progress claims, administrative procedures, photographs, hold backs.
- .13 Appointment of inspection and testing agencies or firms.
- .14 Insurances, transcript of policies.

### 1.3 PROGRESS MEETINGS

- .1 During course of Work and two weeks prior to project completion, schedule progress meetings.
- .2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.
- .3 Notify parties minimum seven days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three days after meeting.
- .5 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for affect on construction schedule and on completion date.
  - .12 Other business.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 RELATED SECTIONS

- .1 Section 01 77 00 - Closeout Procedures.

### 1.2 ELECTRONIC COPY

- .1 Submit electronic and hard copy of colour digital photography in jpg format, standard resolution.
- .2 Identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: 2. Locations of viewpoints determined by Departmental Representative.
- .4 Frequency: monthly with progress statement as directed by Departmental Representative.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 NOT USED

- .1 Not used.

### 1.2 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Actual Finish Date (AF): point in time that Work actually ended on activity
- .3 Actual Start Date (AS): point in time that Work actually started on activity.
- .4 Bar Chart (Gantt chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars.
- .5 Baseline: original approved plan (for Project, work package, or activity), plus or minus approved scope changes.
- .6 Completion Milestones: they are firstly Certificate of Substantial Performance and secondly Certificate of Completion.
- .7 Constraint: applicable restriction that will affect performance of Project. Factors that affect activities can be scheduled.
- .8 Control: process of comparing actual performance with planned performance, analyzing variances, evaluating possible alternatives, and taking appropriate corrective action as needed.
- .9 Critical Activity: any activity on a critical path. Most commonly determined by using critical path method.
- .10 Critical Path: series of activities that determines duration of Project. In deterministic model, critical path is usually defined as those activities with float less than or equal to specified value, often zero. It is longest path through Project.
- .11 Critical Path Method (CPM): network analysis technique used to predict Project duration by analyzing which sequence of activities (which path) has least amount of scheduling flexibility (least amount of float).
- .12 Data Date (DD): date at which, or up to which, Project's reporting system has provided actual status and accomplishments.

- .13 Duration (DU): number of work periods (not including holidays or other non-working periods) required to complete activity or other Project element. Usually expressed as workdays or work weeks.
- .14 Early Finish Date (EF): in critical path method, earliest possible point in time on which uncompleted portions of activity (or Project) can finish, based on network logic and schedule constraints. Early finish dates can change as Project progresses and changes are made to Project plan.
- .15 Early Start Date (ES): in critical path method, earliest possible point in time on which uncompleted portions of activity (or Project) can start, based on network logic and schedule constraints. Early start dates can change as Project progresses and changes are made to Project Plan.
- .16 Finish Date: point in time associated with activity's completion. Usually qualified by one of following: actual, planned, estimated, scheduled, early, late, baseline, target, or current.
- .17 Float: amount of time that activity may be delayed from its early start without delaying Project finish date. Float is mathematical calculation, and can change as Project progresses and changes are made to Project plan. This resource is available to both PWGSC and Contractor.
- .18 Lag: modification of logical relationship that directs delay in successor task.
- .19 Late Finish Date (LF): in critical path method, latest possible point in time that activity may be completed without delaying specified milestone (usually Project finish date).
- .20 Late Start Date (LS): in critical path method, latest possible point in time that activity may begin without delaying specified milestone (usually Project finish date).
- .21 Lead: modification of logical relationship that allows acceleration of successor task.
- .22 Logic Diagram: see Project network diagram.
- .23 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .24 Milestone: significant event in Project, usually completion of major deliverable.
- .25 Monitoring: capture, analysis, and reporting of Project performance, usually as compared to plan.
- .26 Near-Critical Activity: activity that has low total float.
- .27 Non-Critical Activities: activities which when delayed, do not affect specified Contract duration.
- .28 Project Control System: fully computerized system utilizing commercially available software packages.

- .29 Project Network Diagram: schematic display of logical relationships of Project activities. Always drawn from left to right to reflect Project chronology.
- .30 Project Plan: formal, approved document used to guide both Project execution and Project control. Primary uses of Project plan are to document planning assumptions and decisions, facilitate communication among stakeholders, and document approved scope, cost, and schedule baselines. Project plan may be summary or detailed.
- .31 Project Planning: development and maintenance of Project Plan.
- .32 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of Project Work in relation to established milestones.
- .33 Project Schedule: planned dates for performing activities and planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy project objectives. Monitoring and control process involves using project schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .34 Quantified days duration: working days based on 5 day work week, discounting statutory holidays.
- .35 Risk: uncertain event or condition that, if it occurs, has positive or negative effect on Project's objectives.
- .36 Scheduled Finish Date (SF): point in time that Work was scheduled to finish on activity. Scheduled finish date is normally within range of dates delimited by early finish date and late finish date.
- .37 Scheduled Start Date (SS): point in time that Work was scheduled to start on activity. Scheduled start date is normally within range of dates delimited by early start date and late start date.
- .38 Start Date: point in time associated with activity's start, usually qualified by one of following: actual, planned, estimated, scheduled, early, late, target, baseline, or current.
- .39 Work Breakdown Structure (WBS): deliverable-oriented grouping of project elements that organizes and defines total Work scope of Project. Each descending level represents increasingly detailed definition of Project Work.

### 1.3 SYSTEM DESCRIPTION

- .1 Construction Progress Schedule (Project Time Management): describes processes required to ensure timely completion of Project. These processes ensure that various elements of Project are properly co-ordinated. It consists of planning, time estimating, scheduling, progress monitoring and control.
- .2 Planning: this is most basic function of management, that of determining presentation of action and is essential.

- .1 It involves focusing on objective consideration of future, and integrating forward thinking with analysis; therefore, in planning, implicit assumptions are made about future so that action can be taken today.
- .2 Planning and scheduling facilitates accomplishment of objectives and should be considered continuous interactive process involving planning, review, scheduling, analysis, monitoring and reporting.
- .3 Ensure that planning process is iterative and results in generally top-down processing with more detail being developed as planning progresses, and decisions concerning options and alternatives are made. This implies progressively more reliability of scheduling data. Detail Project schedule is used for analysis and progress monitoring.
- .4 Ensure project schedule efficiencies through monitoring.
  - .1 When activities begin on time and are performed according to estimated durations without interruptions, original Critical Path will remain accurate. Changes and delays will however, create an essential need for continual monitoring of Project activities.
  - .2 Monitor progress of Project in detail to ensure integrity of Critical Path, by comparing actual completions of individual activities with their scheduled completions, and review progress of activities that has started but are not yet completed.
  - .3 Monitoring should be done sufficiently often so that causes of delays are immediately identified and removed if possible.
- .5 Project monitoring and reporting: as Project progresses, keep team aware of changes to schedule, and possible consequences. In addition to Bar Charts and CPM networks, use narrative reports to provide advice on seriousness of difficulties and measures to overcome them.
  - .1 Narrative reporting begins with statement on general status of Project followed by summarization of delays, potential problems, corrective measures and Project status criticality.

#### 1.4 CPM REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedule are practical and remain within specified Contract duration.
- .2 Master Plan and Detail Schedule deemed impractical by Departmental Representative are revised and resubmitted for approval.
- .3 Acceptance of Master Plan and Detail Schedule showing scheduled Contract duration shorter than specified Contract duration does not constitute change to Contract. Duration of Contract may only be changed through bilateral Agreement.
- .4 Consider Master Plan and Detail Schedule deemed practical by Departmental Representative, showing Work completed in less than specified Contract duration, to have float.
- .5 First Milestone on Master Plan and Detail Schedule will identify start Milestone with an "ES" constraint date equal to Award of Contract date.
- .6 Calculate dates for completion milestones from Plan and Schedule using

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specified time periods for Contract.

- .7 Certificate of Substantial Performance with "LF" constraint equal to calculated date.
- .8 Calculations on updates to be such that if early finish of Certificate of Substantial Performance falls later than specified Contract duration then float calculation to reflect negative float.
- .9 Delays to non-critical activities, those with float may not be basis for time extension.
- .10 Do not use float suppression techniques such as software constraints, preferential sequencing, special lead/lag logic restraints, extended activity times or imposed dates other than required by Contract.
- .11 Allow for and show Master Plan and Detail Schedule adverse weather conditions normally anticipated. Specified Contract duration has been predicated assuming normal amount of adverse weather conditions.
- .12 Provide necessary crews and manpower to meet schedule requirements for performing Work within specified Contract duration. Simultaneous use of multiple crews on multiple fronts on multiple critical paths may be required.
- .13 Arrange participation on and off site of subcontractors and suppliers, as required by Departmental Representative, for purpose of network planning, scheduling, updating and progress monitoring. Approvals by Departmental Representative of original networks and revisions do not relieve Contractor from duties and responsibilities required by Contract.
- .14 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Certificate of Substantial Performance and Certificate of Completion as defined times of completion are of essence of this contract.

### 1.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Submit to Departmental Representative Project Control System for planning, scheduling, monitoring and reporting of project progress.
- .3 Submit Project Control System to Departmental Representative for approval; failure to comply with each required submission, may result in progress payment being withheld in accordance with Federal Government's GC5 Terms of Payment.
- .4 Include costs for execution, preparation and reproduction of schedule submittals in bid documents.
- .5 Submit letter ensuring that schedule has been prepared in co-ordination with major sub-contractors.
- .6 Refer to article "Progress monitoring and reporting" of this specification Section for frequency of Project control system submittals.

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- .7 Submit Project planning, monitoring and control system data as part of initial schedule submission and monthly status reporting as required by Departmental Representative in following form.
  - .1 USB drive or CD files in original scheduling software containing schedule and cash flow information, labelled with data date, specific update, and person responsible for update.
  - .2 Master Plan Bar Chart.
  - .3 Construction Detail schedule Bar Chart.
  - .4 Listing of project activities including milestones and logical connectors, networks (sub-networks) from Project start to end. Sort activities by activity identification number and accompany with descriptions. List early and late start and finish dates together with durations, codes and float.
  - .5 Criticality report listing activities and milestones with negative, zero and up to 5 days total float used as first sort for ready identification of critical paths through entire project. List early and late starts and finishes dates, together with durations, codes and float for critical activities.
  - .6 Progress report in early start sequence, listing for each trade, activities due to start, underway, or finished within two months from monthly update date. List activity identification number, description and duration. Provide columns for entry of actual start and finish dates, duration remaining and remarks concerning action required.

## 1.6 QUALITY ASSURANCE

- .1 Use experienced personnel, fully qualified in planning and scheduling to provide services from start of construction to Certificate of Completion, including Commissioning.

## 1.7 PROJECT MEETING

- .1 Meet with Departmental Representative within ten working days of Award of Contract date, to establish Work requirements and approach to project construction operations.

## 1.8 WORK BREAKDOWN STRUCTURE (WBS)

- .1 Prepare construction Work Breakdown Structure (WBS) within five working days of Award of Contract date. Develop WBS through at least five levels: Project, stage, element, sub-element and work package.

## 1.9 PROJECT MILESTONES

- .1 Mandatory and recommended project milestones form targets for both Master Plan and Detail Schedule of CPM construction network system.
  - .1 Recommended: Demolition of existing cladding completed within 4 weeks of Award of Contract date.
  - .2 Recommended: New cladding structure completed within 20 weeks of Award of Contract date.

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- .3 Recommended: Certificate of Substantial Performance within 22 weeks of Award of Contract date.
- .4 Recommended: outside work completed within 22 weeks of Award of Contract date.
- .5 Recommended: Certificate of Completion within 26 weeks of Award of Contract date.

#### 1.10 MASTER PLAN

- .1 Structure and base CPM construction networks system on WBS coding in order to ensure consistency throughout Project.
- .2 Prepare comprehensive construction Master Plan (CPM logic diagram) and dependent Cash Flow Projection within five working days of finalizing Agreement to confirm validity or alternates of identified milestones.
  - .1 Master Plan will be used as baseline.
    - .1 Revise baseline as conditions dictate and as required by Departmental Representative.
    - .2 Departmental Representative will review and return revised baseline within five work days.
- .3 Reconcile revisions to Master Plan and Cash Flow Projections with previous baseline to provide continuous audit trail.
- .4 Initial and subsequent Master Plans will include:
  - .1 USB drive or CD containing schedule and cash flow information, clearly labelled with data date, specific update, and person responsible for update.
  - .2 Bar chart identifying coding, activity durations, early/late and start/finish dates, total float, completion as percentile, current status and budget amounts.
  - .3 Network diagram showing coding, activity sequencing (logic), total float, early/late dates, current status and durations.
  - .4 Actual/projected monthly cash flow: expressed monthly and shown in both graphical and numerical form.

#### 1.11 DETAIL SCHEDULE

- .1 Provide detailed project schedule (CPM logic diagram) within ten working days of Award of Contract date showing activity sequencing, interdependencies and duration estimates. Include listed activities as follows:
  - .1 Shop drawings.
  - .2 Samples.
  - .3 Approvals.
  - .4 Procurement.
  - .5 Construction.
  - .6 Installation.
  - .7 Site works.
  - .8 Testing.
  - .9 Commissioning and acceptance.
- .2 Detail CPM schedule to cover in detail minimum period of two months beginning from Award of Contract date with each activity duration approximately five days.
  - .1 Show remaining activities for CPM construction network system up to

- Certificate of Completion and develop complete detail as project progresses.
- .2 Detail activities completely and comprehensively throughout duration of project.
  - .3 Relate Detail Schedule activities to basic activities and milestones developed and approved in Master Plan.
  - .4 Clearly show sequence and interdependence of construction activities and indicate:
    - .1 Start and completion of all items of Work, their major components, and interim milestone completion dates.
    - .2 Activities for procurement, delivery, installation and completion of each major piece of equipment, materials and other supplies, including:
      - .1 Time for submittals, resubmittals and review.
      - .2 Time for fabrication and delivery of manufactured products for Work.
      - .3 Interdependence of procurement and construction activities.
    - .3 Include sufficient detail to assure adequate planning and execution of Work. Activities should generally range in duration from 3 to 15 workdays each.
  - .5 Provide level of detail for project activities such that sequence and interdependency of Contract tasks are demonstrated and allow co-ordination and control of project activities. Show continuous flow from left to right.
  - .6 Ensure activities with no float are calculated and clearly indicated on logical CPM construction network system as being, whenever possible, continuous series of activities throughout length of Project to form "Critical Path". Increased number of critical activities is seen as indication of increased risk.
  - .7 Insert Change Orders in appropriate and logical location of Detail Schedule. After analysis, clearly state and report to Departmental Representative for review effects created by insertion of new Change Order.

#### 1.12 REVIEW OF THE CONSTRUCTION DETAIL SCHEDULE

- .1 Allow 5 work days for review by Departmental Representative of proposed construction Detail Schedule.
- .2 Upon receipt of reviewed Detail Schedule make necessary revisions and resubmit to Departmental Representative for review within 5 work days.
- .3 Promptly provide additional information to validate practicability of Detail Schedule as required by Departmental Representative.
- .4 Submittal of Detail Schedule indicates that it meets Contract requirements and will be executed generally in sequence.

#### 1.13 COMPLIANCE WITH DETAIL SCHEDULE

- .1 Comply with reviewed Detail Schedule.

- .2 Proceed with significant changes and deviations from scheduled sequence of activities that cause delay, only after written receipt of approval by Departmental Representative.
- .3 Identify activities that are behind schedule and causing delay. Provide measures to regain slippage.
  - .1 Corrective measures may include:
    - .1 Increase of personnel on site for effected activities or work package.
    - .2 Increase in materials and equipment.
    - .3 Overtime work.
- .4 Submit to Departmental Representative, justification, project schedule data and supporting evidence for approval of extension to Contract completion date or interim milestone date when required. Include as part of supporting evidence:
  - .1 Written submission of proof of delay based on revised activity logic, duration and costs, showing time impact analysis illustrating influence of each change or delay relative to approved contract schedule.
  - .2 Prepared schedule indicating how change will be incorporated into the overall logic diagram. Demonstrate perceived impact based on date of occurrence of change and include status of construction at that time.
  - .3 Other supporting evidence requested by Departmental Representative.
  - .4 Do not assume approval of Contract extension prior to receipt of written approval from Departmental Representative.
- .5 In event of Contract extension, display in Detail Schedule that scheduled float time available for work involved has been used in full without jeopardizing earned float.
  - .1 Departmental Representative will determine and advise Contractor number of allowable days for extension of Contract based on project schedule updates for period in question, and other factual information.
  - .2 Construction delays affecting project schedule will not constitute justification for extension of contract completion date.

#### 1.14 PROGRESS MONITORING AND REPORTING

- .1 On ongoing basis, Detail Schedule on job site must show "Progress to Date". Arrange participation on and off site of subcontractors and suppliers, as, and when necessary, for purpose of network planning, scheduling, updating and progress monitoring. Inspect Work with Departmental Representative at least once monthly to establish progress on each current activity shown on applicable networks.
- .2 Update and reissue project Work Breakdown Structure and relevant coding structures as project develops and changes.
- .3 Perform Detail Schedule update monthly with status dated (Data Date) on last working day of month. Update to reflect activities completed to date, activities in progress, logic and duration changes.
- .4 Do not automatically update actual start and finish dates by using default mechanisms found in project management software.

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- .5 Submit to Departmental Representative copies of updated Detail Schedule.
- .6 Requirements for monthly progress monitoring and reporting are basis for progress payment request.
- .7 Submit monthly written report based on Detail Schedule, showing Work to date performed, comparing Work progress to planned, and presenting current forecasts. Report must summarize progress, defining problem areas and anticipated delays with respect to Work schedule, and critical paths. Explain alternatives for possible schedule recovery to mitigate any potential delay. Include in report:
  - .1 Description of progress made.
  - .2 Pending items and status of: permits, shop drawings, Change Orders, possible time extensions.
  - .3 Status of Contract completion date and milestones.
  - .4 Current and anticipated problem areas, potential delays and corrective measures.
  - .5 Review of progress and status of Critical Path activities.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not used.

END OF SECTION

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## PART 1 - GENERAL

### 1.1 DEFINITIONS

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

### 1.2 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow

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for progress reporting.

- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Certificate of Substantial Performance and Certificate of Completion as defined times of completion are of essence of this contract.

### 1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Submit to Departmental Representative within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

### 1.4 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule.
  - .1 Recommended: Demolition of existing cladding completed within 4 weeks of Award of Contract date.
  - .2 Recommended: New cladding structure completed within 20 weeks of Award of Contract date.
  - .3 Recommended: Certificate of Substantial Performance within 22 weeks of Award of Contract date.
  - .4 Recommended: outside work completed within 22 weeks of Award of Contract date.
  - .5 Recommended: Certificate of Completion within 26 weeks of Award of Contract date.

### 1.5 MASTER PLAN

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

### 1.6 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

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- .1 Award.
- .2 Shop Drawings, Samples.
- .3 Permits.
- .4 Mobilization.
- .5 Siding.

### 1.7 PROJECT SCHEDULE REPORTING

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

### 1.8 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings specified in Section 01 31 19, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not used.

END OF SECTION

PART 1 -  
GENERAL

1.1  
ADMINISTRATIVE

- .1 Submit to Department Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .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 are acceptable.
- .5 Review submittals prior to submission to Department Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Department Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Department Representative review.
- .10 Keep one reviewed copy of each submission on site.
- .11 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as pdf files. Forward pdf, NMS Edit Professional spp, MS Word, MS Excel, [MS Project] and Autocad dwg files on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.2 SHOP  
DRAWINGS AND  
PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario of Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 5 working days for Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, 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.
- .8 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 Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:

- .1 Fabrication.
  - .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.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit three hard copies and one electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit three hard copies and one electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit three hard copies and one electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
  - .2 Testing must have been within 3 years of date of contract award for project.
- .13 Submit three hard copies and one electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
  - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit three hard copies and one electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit three hard copies and one electronic copy of

- Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit three hard copies and one electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Departmental Representative, 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 same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .21 The review of shop drawings by Environment Canada (EC) or the Design Consultant is for sole purpose of ascertaining conformance with general concept.
- .1 This review shall not mean that EC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
- .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.
- .22 Review of drawings by the Department Representative does not relieve the Contractor of responsibility for the design adequacy and safety.
- .23 Drawings shall be clearly legible and are to illustrate all components that are a part of the system, such as the overall size and openings of the assembly. Where necessary, provide plans, vertical and horizontal sections and enlarged details to clearly illustrate components and other associated information. Information in shop drawings shall include material, thickness of all components, anchorages, construction method and finishes.
- .24 When required by the Consultant, the Contractor shall attend a meeting at the Consultant's office to discuss the shop

drawings and to review their content. The shop drawings shall be submitted a minimum of one week prior to the meeting. The intent of the meeting will be to discuss/confirm the shop drawing and project requirements.

- .25 If required, revise the shop drawings as noted/discussed. Proceed with the mock-up once revised drawings are approved by the Consultant.
- .26 After the meeting and the completion of the mock-up, revise shop drawings as required and submit three copies of shop drawings.

### 1.3 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's site office.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

### 1.4 MOCK-UPS

- .1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

### 1.5 CONSTRUCTION PHOTOGRAPHS

- .1 Submit electronic and hard copy of colour PHOTOGRAPHS digital photography in jpg format, fine resolution.
- .2 Identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: determined by Departmental Representative.
- .4 Frequency: monthly with progress statement and as directed by Departmental Representative.

1.6

CERTIFICATES

AND

TRANSCRIPTS

- .1 Submit the following prior to mobilizing to site:
  - .1 Outline of Construction Safety Manual
  - .2 Names of Trained Site Safety Personnel
  - .3 Proof of WHMIS Training for Site Personnel
  - .4 Names of Project Superintendent and Site Foreman
  - .5 Emergency Telephone Number
  - .6 List of Proposed Hazardous Materials
  - .7 Professional Liability Insurance and Certificate of Authorization for Engineer's Engaged by the Contractor (Metal Siding Manufacturer Engineer)
  - .8 General Commercial Liability Insurance
  - .9 Automobile Liability Certificate of Insurance
  - .10 Schedule of Work
  - .11 Pre-existing Deficiencies in work areas. If one is not submitted, the Contractor is responsible for addressing the deficiencies if the Department Representative suspects the deficiency may have been caused by the work.
- .2 Submit the following before commencing on the respective work:
  - .1 Steel Siding Engineered Shop Drawings and Calculations (3 copies) to include:
    - 1. Details at window jamb, head and sill; cladding termination at the roof; corners, inside and outside; termination at sides; and termination at bottom.
    - 2. All components of the assembly showing construction, methods of joining, bonding, fastening, sealing, anchorage as well as type of material, thickness, finishes and other pertinent details.
    - 3. Provide engineering calculations in support of cladding fastener and masonry anchor locations shown. Show calculations of expansion/contraction allowances and gaps, wind loading and other loading as required by NBC.
  - .2 Manufacturer Written Recommendations Regarding Elastomeric Joint Sealant Application as required by this specification section.
- .3 Submit the following after start of installation:
  - .1 Steel Paint Manufacturer Review Letter certifying that the materials supplied, preparation and application of the paint is in accordance with the manufacturer's specifications.

1.7 WARRANTIES

- .1 Unless otherwise stated, the warranty shall include, at no cost to the Departmental Representative, all labour and materials to correct the defects and deficiencies. This shall include removal and reinstating components where required to

gain access to the defect and/or deficiency. The warranty shall include all performance and aesthetic related issues as determined by the Consultant, such as leakage, debonding, corrosion, fading, discoloration, etc. The warranty excludes reasonable wear and tear.

- .2 The warranty period is two years unless otherwise noted.
- .3 Non-Standard Warranties
  - .1 Pre-Finished Metal Cladding: 5 Years

END OF SECTION

## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 Canadian Standards Association (CSA): Canada
  - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- .2 National Building Code 2010 (NBC):
  - .1 NBC 2010, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
- .3 National Fire Code 2010 (NFC):
  - .1 NFC 2010, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.
- .4 Province of Ontario:
  - .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
  - .2 O. Reg. 490/09, Designated Substances.
  - .3 Workplace Safety and Insurance Act, 1997.
  - .4 Municipal statutes and authorities.
- .5 Treasury Board of Canada Secretariat (TBS):
  - .1 Treasury Board, Fire Protection Standard April 1, 2010  
[www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316&section=text](http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316&section=text).

### 1.2 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .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 operations found in work plan.
  - .3 Measures and controls to be implemented to address identified safety hazards and risks.
  - .4 Provide a Fire Safety Plan, specific to the work location, in accordance with NBC, Division B, Article 8.1.1.3 prior to commencement of work. The plan shall be coordinated with, and integrated into, the existing Building, Emergency Procedures and Evacuation Plan in place at the site. Departmental Representative will provide Building Emergency Procedures and Evacuation Plan. Deliver two copies of the Fire Safety Plan to the Departmental Representative not later than 14 days before commencing work.
  - .5 Contractor's and Sub-contractors' Safety Communication Plan.
  - .6 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing Building Emergency Response

requirements and procedures provided by Departmental Representative.

- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.
- .4 Departmental Representative'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.
- .5 Submit names of personnel and alternates responsible for site safety and health.
- .6 Submit records of Contractor's Health and Safety meetings [when requested].
- .7 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly.
- .8 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
- .9 Submit copies of incident and accident reports.
- .10 Submit Material Safety Data Sheets (MSDS).
- .11 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.
- .12 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel, in accordance with O. Reg. 490, prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

### 1.3 FILING OF NOTICE

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

### 1.4 WORK PERMIT

- .1 Obtain building permits related to project prior to commencement of Work.
- .2 Obtain Hot Work Permit, Lockout tag out procedures to hot work and all permits from the Owner.
- .3 Worker Profile Sheet: The Contractor shall submit to the Departmental Representative a completed Worker Profile Sheet complete with all attachments including copies of licenses, certificates and permits for supporting qualifications to perform required work for a given Project for each individual worker requiring access to the site. The completed Worker Profile Sheets are required for each individual worker prior to working on site.

.4 Hot Work Permit: The Contractor shall submit a completed Hot Work Permit to the Departmental Representative for review and approval. The Departmental Representative's approval is required prior to initiating hot work.

.5 Hot Tap Permit: The Contractor shall submit a completed Hot Tap Permit to the Departmental Representative for review and approval. Approval by the Departmental Representative is required prior to initiating hot tap work.

.6 Lock Out and Tag Out (LOTO) - Isolation (Cont'd) Procedures: The Contractor shall submit a completed LOTO Isolation Form (Zero Energy) to the Departmental Representative for review and approval for all work requiring LOTO. The Departmental Representative's approval of isolation form is required prior to initiating LOTO work.

.7 Live Work Procedure: The Contractor shall submit a completed Live Work Procedure Form to the Departmental Representative for review and approval for all work requiring Live Work procedures. The Departmental Representative's approval of the Live Work Form is required prior to initiating Live Work.

.8 2nd Floor Mechanical Space - Mandatory Safe Working Practices: The Contractor shall obtain training from the Departmental Representative on safe working practices and procedures for the 2nd floor mechanical space for each worker requiring access to the 2nd floor mechanical space. The Contractor shall sign-off individual training forms prior to individual workers being authorized access to the 2nd floor mechanical space.

## 1.5 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

## 1.6 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

## 1.7 REGULATORY REQUIREMENTS

- .1 Comply with the Acts and regulations of the Province of Ontario.
- .2 Comply with specified standards and regulations to ensure safe operations

at site.

## 1.8 PROJECT/SITE CONDITIONS

- .1 Hazardous materials:  
CONDITIONS .1 Refer to 'Designated Substances Survey'  
appended to this Document for all potential  
hazardous substances.
- .2 Cease operations and notify the  
Departmental Representative immediately for  
special protective and disposal instructions  
if hazardous materials are uncovered during  
work of this Section.

## 1.9 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 Departmental Representative may respond in writing, where deficiencies or  
concerns are noted and may request re-submission with correction of  
deficiencies or concerns either accepting or requesting improvements.
- .3 Relief from or substitution for any portion or provision of minimum Health  
and Safety standards specified herein or reviewed site-specific Health and  
Safety Plan shall be submitted to Departmental Representative in writing.

## 1.10 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter  
0.1, as amended.

## 1.11 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 Where applicable the Contractor shall be designated "Constructor", as defined  
by Occupational Health and Safety Act for the Province of Ontario.

## 1.12 UNFORSEEN HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition

become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.

- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.

### 1.13 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 Have site-related working experience specific to activities associated with designated substances.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 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.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 Be on site during execution of Work and report directly to and be under direction of site supervisor.

### 1.14 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 of Ontario, and in consultation with Departmental Representative.
  - .1 Contractor's Safety Policy.
  - .2 Constructor's Name.
  - .3 Notice of Project.
  - .4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
  - .5 Ministry of Labour Orders and reports.
  - .6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
  - .7 Address and phone number of nearest Ministry of Labour office.
  - .8 Material Safety Data Sheets.
  - .9 Written Emergency Response Plan.
  - .10 Site Specific Safety Plan.
  - .11 Valid certificate of first aider on duty.
  - .12 WSIB "In Case of Injury At Work" poster.
  - .13 Location of toilet and cleanup facilities.

### 1.15 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

#### 1.16 BLASTING

- .1 Blasting or other use of explosives is not permitted.

#### 1.17 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

#### 1.18 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.
- .2 Assign responsibility and obligation to Health and Safety Coordinator to stop or start Work when, at Health and Safety Coordinator's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

### PART 2 - PRODUCTS

#### 2.1 NOT USED

- .1 Not used.

### PART 3 - EXECUTION

#### 3.1 NOT USED

- .1 Not used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 REFERENCES AND CODES

- .1 Perform Work in accordance with National Building Code of Canada (NBC) 2010, National Fire Code of Canada (NFC) 2010 and Ontario Building Code (OBC) 2012, including all amendments up to bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply as directed by the Departmental Representative.
- .2 Meet or exceed requirements of:
  - .1 Contract documents.
  - .2 Specified standards, codes and referenced documents.

### 1.2 HAZARDOUS MATERIAL DISCOVERY

- .1 Stop work immediately and notify Departmental Representative if materials which may contain designated substances or PCB's other than those identified in Section 01 35 29 are discovered in course of work.

### 1.3 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions.

### 1.4 RELICS AND ANTIQUITIES

- .1 Relics and antiquities, and items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tables, and similar objects found on site shall remain the property of Parks Canada. Protect such articles and request directives from Departmental Representative.

### 1.5 IAQ - INDOOR AIR QUALITY

- .1 Comply with CSA-Z204-94(R1999), Guideline for Managing Indoor Air Quality in Office Buildings and CSA B651-12.

### 1.6 ACCESSIBLE DESIGN

- .1 Comply with CSA B651-12, Accessible Design for the Built Environment, unless specified otherwise. In any case of conflict or discrepancy between the building codes and CSA B651, the requirements of CSA B651 shall apply.

### 1.7 TAXES

- .1 Pay applicable Federal, Provincial and Municipal taxes.

1.8 EXAMINATION

- .1 Examine existing conditions and determine conditions affecting work.
- .2 Conduct concrete floor moisture testing using Calcium Chloride moisture tests.
  - .1 Submit test results to Departmental Representative for approval prior to installing any flooring. Conduct one test per 100 m2 of area being covered.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 ABBREVIATIONS AND ACRONYMS

- .1 The abbreviations and acronyms are commonly found in the Project Manual and represent the associated organizations or terms.

### 1.2 MATERIALS, EQUIPMENT AND METHODS

- .1 A:  
.1 AB: anchor bolt.  
.2 AC: acoustic.  
.3 AC PAN: acoustic panel.  
.4 ACU: acoustic unit ceiling.  
.5 AFF: above finished floor.  
.6 AC PLAS: acoustic plaster.  
.7 ACT: acoustic tile.  
.8 ACR CU LVR: acrylic cube louvre.  
.9 ADH: adhesive.  
.10 ADJ: adjustable.  
.11 A/C: air conditioner.  
.12 AHU: air handling unit.  
.13 AL: aluminum.  
.14 ANOD: anodized.  
.15 APPROX: approximate.  
.16 ARCH: architecture.  
.17 ARCH BLK: architectural block.  
.18 AVB: air vapour barrier.
- .2 B:  
.1 B: base.  
.2 BEAST: benthic assessment of sediment.  
.3 BH: bore hole.  
.4 BHP: brake horse power.  
.5 BL: bottom layer.  
.6 BLK: block.  
.7 BLKD: bulkhead.  
.8 BM: beam.  
.9 BOT: bottom.  
.10 BMP: best management practice.  
.11 B PL: base plate.  
.12 BRG: bearing.  
.13 BRK: brick.  
.14 BSMT: basement.  
.15 BTEX: benzene, toluene, ethylbenzene and xylenes.  
.16 BUR: built-up roof.
- .3 C:  
.1 CAL: caliper.  
.2 CANTIL: cantilever.  
.3 CB: catch basin.

.4 CC: centre to centre.  
.5 CCN: contemplated change notice.  
.6 CDF: controlled density fill.  
.7 CEC: Canadian Electrical Code.  
.8 CF: chair fabric.  
.9 CHAN: channel.  
.10 CHS: Canadian hydrographic service.  
.11 CJ: construction joint.  
.12 CL: centreline.  
.13 CK: cork.  
.14 CLG: ceiling.  
.15 CLR: clear.  
.16 COL: column.  
.17 CONC: concrete.  
.18 CONC BLK: concrete block.  
.19 CONC BRK: concrete brick.  
.20 CONT: continuous.  
.21 CONT J: control joint.  
.22 COMPL: complete.  
.23 CM: centimetre. (Nursery stock).  
.24 CP: circulating pump.  
.25 CPL: cement plaster.  
.26 CPM: critical path method.  
.27 CPT: carpet.  
.28 CPTT: carpet tile.  
.29 CT: ceramic tile.  
.30 CTE: connect to existing.  
.31 CV: control valve.  
.32 CVT: conductive vinyl tile.  
.33 C/W: complete with.

.4 D:  
.1 D: deep.  
.2 dB: decibels.  
.3 DB: dry-bulb.  
.4 DD: dutch door.  
.5 DEG: degree.  
.6 DF: drinking fountain.  
.7 DIA: diameter.  
.8 DIM: dimension.  
.9 DL: dead load.  
.10 DMNT: demountable.  
.11 DP: dampproofing.  
.12 DR: door.  
.13 DRP: drapery.  
.14 DWL: dowel.

.5 E:  
.1 EA: each.  
.2 EC: epoxy coating.  
.3 ECF: engineered containment facility.  
.4 EE: each end.  
.5 EF: each face (architectural/structural).  
.6 EF: exhaust fan (mechanical/electrical).  
.7 EL: elevation.  
.8 ELEC: electric.

- .9 ELEV: elevator.
  - .10 EM: expanded metal.
  - .11 ENCL: enclosure.
  - .12 EQ: equal.
  - .13 ET: expansion tank.
  - .14 EXH: exhaust.
  - .15 EXIST: existing.
  - .16 EXPJ: expansion joint.
  - .17 EXP STRUCT: exposed structure.
  - .18 EXT: exterior.
  - .19 EW: each way.
  - .20 EWT: entering water temperature.
- .6 F:
- .1 FC: fuel contributed.
  - .2 FD: floor drain.
  - .3 FDN: foundation.
  - .4 FEAT W: feature wall.
  - .5 FEEXT: fire extinguisher.
  - .6 FH: fire hose.
  - .7 FHC: fire hose cabinet.
  - .8 FHR: fire hose rack.
  - .9 FIN: finish.
  - .10 FIP: federal identity program.
  - .11 FL: floor.
  - .12 FLD: field.
  - .13 FLUOR: fluorescent.
  - .14 FR: frame.
  - .15 FRR: fire resistance rating.
  - .16 FTG: footing.
- .7 G:
- .1 GALV: galvanized steel.
  - .2 GB: grab bar.
  - .3 GBD: gypsum board.
  - .4 GC: General Conditions.
  - .5 GF: ground floor.
  - .6 GFCI: ground fault circuit interrupter.
  - .7 GL: glass or glazing.
  - .8 GL BLK: glass block.
  - .9 GPC: gypsum plaster ceiling.
  - .10 GPW: gypsum plaster wall.
  - .11 GT: glass tile.
- .8 H:
- .1 HB: hose bib.
  - .2 HC: hollow core.
  - .3 HCWD: hollow core wood door.
  - .4 HD: hand dryer.
  - .5 HDW: hardware.
  - .6 HDWD: hardwood.
  - .7 HEX: heat exchanger.
  - .8 HM: hollow metal.
  - .9 HOR: horizontal.
  - .10 HOR EF: horizontal each face.
  - .11 HP: hydro pole.

- .12 HPA: Hamilton Port Authority.
  - .13 HR: hour.
  - .14 HRV: heat recovery ventilator.
  - .15 HT: height.
  - .16 HTR: heater.
  - .17 HUM: humidifier.
  - .18 HWT: hot water tank.
  - .19 HYD: hydrant.
  - .20 HZ: Hertz frequency, cycles per second.
- .9 I:
- .1 ICF: insulated concrete formwork.
  - .2 ID: inside diameter.
  - .3 INS: insulation.
  - .4 INTLK: interlock.
- .10 J:
- .1 JT: joint.
- .11 K:
- .1 KPL: kick plate.
- .12 L:
- .1 LAT: leaving air temperature.
  - .2 LAV: lavatory.
  - .3 LDG: landing.
  - .4 LG: long.
  - .5 LINO: linoleum.
  - .6 LL: live load.
  - .7 LT: light.
  - .8 LWT: leaving water temperature.
- .13 M:
- .1 MAS: masonry.
  - .2 MAS FL: masonry flashing.
  - .3 MAX: maximum.
  - .4 MBG: metal bar grating.
  - .5 MCL: metal cube louvre.
  - .6 MECH: mechanical.
  - .7 MET: metal.
  - .8 MET DK: metal deck.
  - .9 MET FL: metal flashing.
  - .10 MET GRID CLG: metal grid ceiling.
  - .11 MET GRTG: metal grating.
  - .12 MET LIN CLG: metal linear ceiling.
  - .13 MET T PTN: metal toilet partition.
  - .14 MH: maintenance hole.
  - .15 MIN: minimum.
  - .16 MLP: metal lath and plaster.
  - .17 MO: masonry opening.
  - .18 MR: marble.
  - .19 MT: metal threshold.
  - .20 MWP: membrane waterproofing.
- .14 N:
- .1 NBC: national building code.

- .2 NC: normally closed.
- .3 NF: near face.
- .4 NFC: national fire code.
- .5 NIC: not in contract.
- .6 NO: number.
- .7 NRC: noise reduction coefficient.
- .8 NRP: non removable pin.
- .9 NTS: not to scale.
  
- .15 O:
  - .1 OA: outside air.
  - .2 OBC: Ontario building code.
  - .3 OC: on centre.
  - .4 OD: outside diameter.
  - .5 OPNG: opening.
  - .6 OPR: operator.
  - .7 OVHD: overhead.
  - .8 OWSJ: open web steel joist.
  
- .16 P:
  - .1 P: prefinished.
  - .2 PAH: polynuclear aromatic hydrocarbons.
  - .3 PARG: parging.
  - .4 PCC: precast concrete.
  - .5 PCT: porcelain ceramic tile.
  - .6 PED ACS FLG: pedestal access flooring.
  - .7 PF: panel fabric.
  - .8 PH: phase.
  - .9 PL: plate.
  - .10 PLAM: plastic laminate.
  - .11 PLAS: plaster.
  - .12 PLYWD: plywood.
  - .13 PR: pair.
  - .14 PREFAB: prefabricated.
  - .15 PREFIN: prefinished.
  - .16 PRESS: pressure.
  - .17 PRFL: profile.
  - .18 PRV: pressure regulating valve.
  - .19 PT: paint.
  - .20 PTD: paper towel dispenser.
  - .21 PTN: partition.
  - .22 PVC: polyvinyl chloride.
  
- .17 Q:
  - .1 QTB: quarry tile base.
  - .2 QTF: quarry tile floor.
  - .3 QTR: quarry tile roof.
  
- .18 R:
  - .1 R: radius.
  - .2 RA: return air.
  - .3 RAD: return air damper.
  - .4 RB: resilient base.
  - .5 RC: reinforced concrete.
  - .6 RCPT: receptacle.
  - .7 RD: roof drain.

- .8 REINF: reinforced/reinforcing.
  - .9 REQD: required.
  - .10 REQT: requirement.
  - .11 RFT: rubber floor tile.
  - .12 RM: room.
  - .13 RO: rough opening.
  - .14 RP: radiant panel.
  - .15 RRS: recycled rubber sheet.
  - .16 RRT: recycled rubber tile.
  - .17 RSD: rolling steel door.
  - .18 RSF: rubber sheet flooring.
  - .19 RT: rubber tile.
  - .20 RTU: roof top unit.
  - .21 RWL: rain water leader.
- .19 S:
- .1 SA: supply air.
  - .2 SAN SEW: sanitary sewer.
  - .3 SCHED: schedule.
  - .4 SC: solid core.
  - .5 SCRN: screen.
  - .6 SCWD: solid core wood door.
  - .7 SD: smoke developed.
  - .8 SDT: static dissipative tile.
  - .9 SECT: section.
  - .10 SH: sill height.
  - .11 SIM: similar.
  - .12 SL: sliding.
  - .13 SLR: sealer.
  - .14 SPEC: specification.
  - .15 SS: stainless steel.
  - .16 STD: standard.
  - .17 STL: steel.
  - .18 STL BM: steel beam.
  - .19 STC: sound transmission class.
  - .20 STL FL DK: steel floor deck.
  - .21 STL PL: steel plate.
  - .22 STN: stone.
  - .23 STR: structure or structural.
  - .24 ST SEW: storm sewer.
  - .25 S&U: stain and urethane.
  - .26 S&V: stain and varnish.
  - .27 SVT: solid vinyl tile.
- .20 T:
- .1 T: top.
  - .2 T&B: top and bottom.
  - .3 TCB: turbidity control plan.
  - .4 TEL: telephone.
  - .5 TER: terrazzo.
  - .6 TERT: terrazzo tile.
  - .7 THKNS: thickness.
  - .8 THR: threshold.
  - .9 TMPD: tempered.
  - .10 TOPG: topping.
  - .11 TRANSV: transverse.

- .12 TYP: typical.
- .21 U:  
.1 U: urethane.  
.2 U/C: undercut.  
.3 UGRD: underground.  
.4 UNO: unless noted otherwise.  
.5 UOS: unless otherwise specified.  
.6 U/S: underside.  
.7 UR: urinal.
- .22 V:  
.1 V: volt.  
.2 VCF: vinyl coated fabric.  
.3 VCT: vinyl composition tile.  
.4 VEL: velocity.  
.5 VERT: vertical.  
.6 VERT B: vertical blinds.  
.7 VERT EF: vertical each face.  
.8 VSF: vinyl sheet flooring.  
.9 VPT: vinyl plank flooring.  
.10 VT: vinyl tile.  
.11 VWC: vinyl wall covering.
- .23 W:  
.1 WB: wet-bulb.  
.2 WC: water closet.  
.3 W-C: wall connectors.  
.4 WD: wood.  
.5 WDV: wood veneer.  
.6 WG: water gauge.  
.7 WH: wall hydrant.  
.8 WHMIS: workplace hazardous materials information system.  
.9 WP: waterproofing.  
.10 WR: washroom.  
.11 WSIB: workplace safety and insurnace board.  
.12 WT: weight.  
.13 WTP: water treatment plant.

### 1.3 STANDARDS ORGANIZATIONS

- .1 Standards writing organizations:
- .1 AA - Aluminum Association.  
.2 ACPA - American Concrete Pipe Association.  
.3 ANSI - American National Standards Institute.  
.4 ASHRAE - American Society of Heating and Refrigerating and Air-Conditioning Engineers.  
.5 ASTM - American Society for Testing and Materials.  
.6 AWI/AWMAC - Architectural Woodwork Institute/Architectural Woodwork Manufacturers Association of Canada.  
.7 AWPA - American Wood Preservers' Association.  
.8 AWWA - American Water Works Association.  
.9 BHMA - Builders Hardware Manufacturers Association.  
.10 CCDC - Canadian Construction Documents Committee.  
.11 CCMPA - Canadian Concrete Masonry Producers Association.

- .12 CGSB - Canadian General Standards Board.
- .13 CNTA - Canadian Nursery Trades Association.
- .14 CPCA - Canadian Painting Contractors Association.
- .15 CRCA - Canadian Roofing Contractors Association.
- .16 CSA - Canadian Standards Association.
- .17 CSC - Construction Specifications Canada.
- .18 CSDMA - Canadian Steel Door Manufacturers Association.
- .19 CSI - Construction Specifications Institute.
- .20 CSSBI - Canadian Sheet Steel Building Institute.
- .21 CRCA - Canadian Roofing Contractors Association.
- .22 DHI - Door and Hardware Insitute.
- .23 EEMAC - Electrical and Electronic Manufacturer's Association of Canada.
- .24 ESA - Electrical Safety Authority.
- .25 FCC - Fire Commissioner of Canada.
- .26 FSC - Forest Stewardship Council.
- .27 GANA - Glass Association of North America.
- .28 HMMA - Hollow Metal Manufacturers Association.
- .29 IEEE - Institute of Electrical and Electronics Engineers Inc.
- .30 ISO - International Organization for Standardization.
- .31 IWFA - International Window Film Association.
- .32 LEED - LEED Canada, Leadership in Energy and Environmental Design.
- .33 MPI - Master Painters Insitute.
- .34 NAAMM - National Association of Architectural Metal Manufacturers.
- .35 NCPI - National Clay Pipe Institute.
- .36 NEMA - National Electrical Manufacturers Association.
- .37 NFPA - National Fire Protection Association.
- .38 OPSD - Ontario Provincial Standard Drawings.
- .39 OPSS - Ontario Provincial Standard Specifications.
- .40 PPI - Plasctics Pipe Institute.
- .41 SDI - Steel Door Intitute.
- .42 SCAQMD - South Coast Air Quality Management District.
- .43 TIA - Telecommunications Industry Association.
- .44 TIAC - Thermal Insulation Association of Canada.
- .45 TTMAC - Terrazzo Tile and Marble Association of Canada.
- .46 UL - Underwriters Laboratories.
- .47 ULC - Underwriters Laboratories of Canada.
- .48 US EPA - United States Environmental Protection Agency.
- .49 WH - Warnock Hersey.

#### 1.4 FEDERAL GOVERNMENT DEPART- MENTS AND AGENGIES

- .1 Departments, agencies and crown corporations.
- .1 CEAA - Canadian Environmental Assessment Agency.
- .2 CSC - Correctional Service Canada.
- .3 CRA - Canada Revenue Agency.
- .4 DND - Department of National Defence.
- .5 EC - Environment Canada.
- .6 FHBRO - Federal Heritage Buildings Review Office.
- .7 HC - Health Canada.
- .8 HCD - Heritage Conservation Directorate.
- .9 LC - Labour Canada.
- .10 PC - Parks Canada.
- .11 PWGSC - Public Works and Government Services Canada.
- .12 RCMP - Royal Canadian Mounted Police.
- .13 TBS - Treasury Board Secretariat.

- .14 TC - Transport Canada.

### 1.5 PROVINCIAL GOVERNMENT DEPART- MENTS AND AGENGIES

- .1 MOEE - Ontario Ministry of Environment and Energy.
- .2 MOL - Ontario Ministry of Labour.
- .3 MTO and MOT - Ontario Ministry of Transportation.
- .4 TSSA - Technical Standards and Safety Authority.

### 1.6 INTERNATIONAL GOVERNMENT DEPARTMENTS AND AGENCIES

- .1 DOHMH - New York City Department of Health and Mental Hygiene, USA.
- .2 GSA - Government Services Administration, USA.

### 1.7 UNITS OF MEASURE METRIC

- .1 The following abbreviations of units of measure are commonly found in the Project Manual:
  - .1 C: Celsius.
  - .2 cm: centimetre.
  - .3 kg: kilogram.
  - .4 kg/m<sup>3</sup>: kilogram per cubic metre.
  - .5 kN: kilonewton.
  - .6 kPa: kilopascals.
  - .7 kw: kilowatts.
  - .8 l/s: litre per second.
  - .9 m: metre.
  - .10 m<sup>3</sup>: cubic metre.
  - .11 mg/kg: milligrams per kilogram.
  - .12 mg/L: milligrams per litre.
  - .13 mm: millimetres.
  - .14 MPa: megapascal.
  - .15 NTU: nephelometric turbidity unit.
  - .16 ppm: parts per million.
  - .17 ug/L: micrograms per litre.
  - .18 ug/m<sup>3</sup>: micrograms per cubic metre.

### 1.8 UNITS OF MEASURE IMPERIAL

- .1 The following abbreviations of units of measure are commonly found in the Project Manual:
  - .1 BTU: British thermal units.
  - .2 CFM: cubic feet per minute.
  - .3 F: Fahrenheit.
  - .4 ft: foot/feet.

- .5 FPI: fins per inch.
- .6 FPM: feet per minute.
- .7 ga: gauge.
- .8 gpm: gallons per minute.
- .9 in: inches.
- .10 lbs: pounds.
- .11 NTU: nephelometric turbidity unit.
- .12 psi: pounds-force per square inch.
- .13 PSIG: PSI gauge.
- .14 ppm: parts per million.
- .15 RPM: revolutions per minute.

### 1.9 LEED TERMS

- .1 Acronyms specific to LEED:
  - .1 CI: commercial interiors.
  - .2 EQ: environmental quality.
  - .3 MR: material and resources.
  - .4 NC: new construction.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 INSPECTION

- .1 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.2 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative may deduct from Contract Amount difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative.

1.3 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental

Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.

- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 Mock-ups may remain as part of Work.
- .6 Match properties of the intended finish product and the mock-up shall be installed by the same installers who will perform the general installation using the materials and methods specified.
- .7 Be 100% complete and approved by Departmental representative and Departmental Representative. Full-scale application may only proceed upon written approval of the mock-up by the Departmental Representative. The Contractor is responsible to arrange for Departmental Representative and Departmental representative to be present during installation to view components which may become concealed as installation proceeds (e.g. structural anchorage, perimeter insulation, etc.). Rejected mock-ups are to be corrected as specified by the Departmental Representative. Upon written approval the approved mock-up forms the standard for the method and quality of work to be performed through-out the project.

1.4 MOCK-UPS REQUIRED

- .1 Steel Siding: A minimum of one mock-up to include window, corners and other unique conditions; Size: 1000mm x 1000mm
- .2 Elastomeric Joint Sealants For Review of Application Methods: Complete a minimum of 3 mock-ups for each material and substrate type, with the manufacturer representative present, that includes the following:
  - .1 Install the specified sealant at representative locations;
  - .2 Checking existing sealant removal and surface preparation procedures (solvent wipe and primer, etc.); and
  - .3 Allow the sealant to cure according to manufacturer recommendations. Perform adhesion testing at a minimum of 3 locations for each material and substrate type.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Temporary utilities.

1.2 RELATED SECTIONS

- .1 Section 01 52 00 - Construction Facilities.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures.

1.3 NOT USED

- .1 Not Used.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.

1.5 INSTALLATION AND REMOVAL

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

1.6 DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.7 WATER SUPPLY

- .1 Departmental Representative will provide continuous supply of potable water for construction use.

1.8 TEMPORARY HEATING AND VENTILATION

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
  - .1 Facilitate progress of Work.
  - .2 Protect Work and products against dampness and cold.
  - .3 Prevent moisture condensation on surfaces.
  - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
  - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10°C in areas where construction is in progress.
- .5 Ventilating:
  - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Ventilate temporary sanitary facilities.
  - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

### 1.9 TEMPORARY POWER AND LIGHT

- .1 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
- .2 Power supply is available and will be provided for construction use at no cost. Connect to existing power supply in accordance with Canadian Electrical Code.
- .3 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Departmental Representative provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

### 1.10 NOT USED

- .1 Not Used.

1.11 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - NOT USED

3.1 NOT USED

- .1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Construction aids.
- .2 Office and sheds.
- .3 Parking.
- .4 Project identification.

### 1.2 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-2008, Stipulated Price Contract.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.189-2000, Exterior Alkyd Primer for Wood.
  - .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA A23.1-[09]/A23.2-[09], Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA 0121-[08], Douglas Fir Plywood.
  - .3 CSA Z797-09, Code of practice for Access Scaffold.
  - .4 CAN/CSA-Z321-[96(R2006)], Signs and Symbols for the Occupational Environment, withdrawn but still available from CSA, CCOHS and Techstreet.

### 1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.

### 1.4 INSTALLATION AND REMOVAL

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

### 1.5 SCAFFOLDING

- .1 Scaffolding in accordance with CSA Z797.
- .2 Provide and maintain scaffolding, ladders and temporary stairs, if required.

### 1.6 HOISTING

- .1 Provide, operate and maintain hoists/cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
- .2 Hoists/cranes shall be operated by qualified operator.

### 1.7 ELEVATORS

- .1 Designated freight elevators may be used by construction personnel and transporting of materials]. Co-ordinate use with Departmental Representative.
- .2 Provide protective coverings for finish surfaces of cars and entrances.

### 1.8 SITE STORAGE/LOADING

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

### 1.9 CONSTRUCTION PARKING

- .1 Parking will be permitted on site provided it does not disrupt performance of Work.
- .2 Provide and maintain adequate access to project site.
- .3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
- .4 Clean construction runways and taxi areas where used by Contractor's equipment.

#### 1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

#### 1.11 SANITARY FACILITIES

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

#### 1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .8 Dust control: adequate to ensure safe operation at all times.
- .9 Provide snow removal during period of Work.

#### 1.13 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.

- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - NOT USED

3.1 NOT USED

- .1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Barriers.
- .2 Environmental Controls.
- .3 Traffic Controls.
- .4 Fire Routes.

### 1.2 RELATED SECTIONS

- .1 Section 01 51 00 - Temporary Utilities.
- .2 Section 01 52 00 - Construction Facilities.

### 1.3 REFERENCES

- .1 Canadian General Standards Board (CGSB):
  - .1 CAN/CGSB-1.189-2000, Exterior Alkyd Primer for Wood.
  - .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA):
  - .1 CSA-0121-08, Douglas Fir Plywood.

### 1.4 INSTALLATION AND REMOVAL

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

### 1.5 HOARDING

- .1 Erect temporary site enclosure using modular freestanding fencing: galvanized, minimum 1.8 m high, chain link or welded steel mesh, pipe rail. Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys. Maintain fence in good repair.

### 1.6 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around open edges of floors and roofs.

### 1.7 WEATHER ENCLOSURES

- .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
- .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
- .3 Design enclosures to withstand wind pressure.

### 1.8 DUST TIGHT SCREENS

- .1 Provide dust tight screens to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Maintain and relocate protection until such work is complete.

### 1.9 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

### 1.10 PUBLIC TRAFFIC FLOW

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

### 1.11 FIRE ROUTES

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

### 1.12 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

### 1.13 PROTECTION OF BUILDING FINISHES

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.

- .3 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Product quality, availability, storage, handling, protection, and transportation.
- .2 Manufacturer's instructions.
- .3 Quality of Work, coordination and fastenings.
- .4 Existing facilities.

### 1.2 RELATED SECTIONS

- .1 Section 01 45 00 - Quality Control.

### 1.3 REFERENCES

- .1 Within text of specifications, reference may be made to reference standards.
- .2 Conform to these standards, in whole or in part as specifically requested in specifications.
- .3 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .4 The cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.
- .5 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.
- .6 OPSS Ontario Provincial Standard Specifications and OPSD Ontario Provincial Standard Drawings quoted in these specifications are available online at <http://www.raqsa.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage>.

### 1.4 QUALITY

- .1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.

- .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

#### 1.5 AVAILABILITY

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

#### 1.6 METRIC SIZED MATERIALS

- .1 SI metric units of measurement are used exclusively on the drawings and in the specifications for this project.
- .2 The Contractor is required to provide metric products in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market.
- .3 Claims for exemptions from use of metric sized products shall be in writing and fully substantiated with supportive documentation. Promptly submit application to Departmental Representative for consideration and ruling. Non-metric sized products may not be used unless Contractor's application has been approved in writing by the Departmental Representative.
- .4 Difficulties caused by the Contractor's lack of planning and effort to obtain modular metric sized products which are available on the Canadian market will not be considered sufficient reasons for claiming that they cannot be provided.
- .5 Claims for additional costs due to provision of specified modular metric sized products will not be considered.

### 1.7 STORAGE, HANDLING AND PROTECTION

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

### 1.8 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by Departmental Representative. Unload, handle and store such products.

### 1.9 MANUFACTURER'S INSTRUCTIONS

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

Time.

#### 1.10 QUALITY OF WORK

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

#### 1.11 CO-ORDINATION

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

#### 1.12 CONCEALMENT

- .1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation, inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

#### 1.13 REMEDIAL WORK

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

#### 1.14 LOCATION OF FIXTURES

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

### 1.15 FASTENINGS

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

### 1.16 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.

### 1.17 PROTECTION OF WORK IN PROGRESS

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

### 1.18 EXISTING UTILITIES

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

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COMMON PRODUCT  
REQUIREMENTS

Section 01 61 00  
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PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00.
- .2 Submit written request in advance of cutting or alteration which affects:
  - .1 Structural integrity of elements of project.
  - .2 Integrity of weather-exposed or moisture-resistant elements.
  - .3 Efficiency, maintenance, or safety of operational elements.
  - .4 Visual qualities of sight-exposed elements.
  - .5 Work of Owner or separate contractor.
- .3 Include in request:
  - .1 Identification of project.
  - .2 Location and description of affected Work.
  - .3 Statement on necessity for cutting or alteration.
  - .4 Description of proposed Work, and products to be used.
  - .5 Alternatives to cutting and patching.
  - .6 Effect on Work of Owner or separate contractor.
  - .7 Written permission of affected separate contractor.
  - .8 Date and time work will be executed.

### 1.2 MATERIALS

- .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00.

### 1.3 PREPARATION

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

#### 1.4 EXECUTION

- .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .8 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .10 Restore work with new products in accordance with requirements of Contract Documents.
- .11 Submit proposed materials, finishes and installation method for patching to Departmental Representative for approval, prior to patching.
- .12 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

#### 1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse, recycling in accordance with Section 01 74 20.

### PART 2 - PRODUCTS

#### 2.1 NOT USED

- .1 Not Used.

### PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Progressive cleaning.
- .2 Final cleaning.

### 1.2 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site containers for collection of waste materials and debris.
- .5 Provide and use clearly marked separate bins for recycling. Refer to Section 01 74 20.
- .6 Remove waste material and debris from site and deposit in waste container at end of each working day.

### 1.3 FINAL CLEANING

- .1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction

for disposal of waste and debris.

- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 HEPA vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .16 Sweep and wash clean paved areas.
- .17 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
- .18 Clean roofs, downspouts, and drainage systems.
- .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .20 Remove snow and ice from access to building.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

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## PART 1 - GENERAL

### 1.1 CONSTRUCTION & DEMOLITION WASTE

- .1 Carefully deconstruct and source separate materials/equipment and divert, from D&C waste destined for landfill to maximum extent possible. Target for this project is 50% diversion from landfill. Reuse, recycle, compost, anaerobic digest or sell material for reuse except where indicated otherwise. On site sales are not permitted.
- .2 Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.
  - .1 Provide facilities for collection, handling and storage of source separated wastes.
  - .2 Source separate the following waste:
    - .1 Brick and portland cement concrete.
    - .2 Corrugated cardboard.
    - .3 Wood, not including painted or treated wood or laminated wood.
    - .4 Gypsum board, unpainted.
    - .5 Steel.
    - .6 Items indicated in Section 02 42 92, Deconstruction and Waste Products Workplan Summary.
- .3 Submit a waste reduction workplan indicating the materials and quantities of material that will be recycled and diverted from landfill.
  - .1 Indicate how material being removed from the site will be reused, recycled, composted or anaerobically digested using Section 02 42 93, Deconstruction and Waste Products Workplan Summary.
- .4 Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.

### 1.2 WASTE PROCESSING SITES

- .1 Province of: Ontario.
  - .1 Ministry of Environment and Energy, 135 St. Clair Avenue West, Toronto, ON, M4V 1P5.
  - .2 Telephone: 800-565-4923 or 416-323-4321.
  - .3 Fax: 416-323-4682.
- .2 Recycling Council of Ontario: 215 Spadina Avenue, #225, Toronto, ON, M5T 2C7.
  - .1 Telephone: 416-657-2797.
  - .2 Fax: 416-960-8053.
  - .3 Email: rco@rco.on.ca.
  - .4 Internet: <http://www.rco.on.ca/>.

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PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Government Chief Responsibility for the Environment.

Province	Address	General	Fax	<u>Inquiries</u>
	Ontario	Ministry of Environment and Energy 135 St Clair Avenue West Toronto, ON M4V 1P5	(416) 323-4321 565-4923	(416) 323-4682
	Canada	Environment Toronto, ON	(416) 734-4494	

END OF SECTION

## PART 1 - GENERAL

### 1.1 INSPECTION AND DECLARATION

- .1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
  - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  - .2 Request Departmental Representative's Inspection.
- .2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .3 Completion: submit written certificate that following have been performed:
  - .1 Work has been completed and inspected for compliance with Contract Documents.
  - .2 Defects have been corrected and deficiencies have been completed.
  - .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
  - .5 Operation of systems have been demonstrated to Owner's personnel.
  - .6 Work is complete and ready for final inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

### 1.2 CLEANING

- .1 In accordance with Section 01 74 11.
- .2 Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with Section 01 74 20.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 As-built, samples, and specifications.
- .2 Equipment and systems.
- .3 Product data, materials and finishes, and related information.
- .4 Operation and maintenance data.
- .5 Spare parts, special tools and maintenance materials.
- .6 Warranties and bonds.
- .7 Final site survey.

### 1.2 RELATED SECTIONS

- .1 Section 01 91 00 - Commissioning - General Requirements.
- .2 Section 01 79 00 - Demonstration and Training.

### 1.3 SUBMISSION

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .2 Copy will be returned after final inspection, with Departmental Representative's comments.
- .3 Revise content of documents as required prior to final submittal.
- .4 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of maintenance manuals and commissioning documentation in English.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 If requested, furnish evidence as to type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

- .8 Pay costs of transportation.

#### 1.4 FORMAT

- .1 Organize data in the form of an instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: Manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

#### 1.5 CONTENTS - EACH VOLUME

- .1 Table of Contents: provide title of project;
  - .1 Date of submission; names,
  - .2 Addresses, and telephone numbers of Contractor with name of responsible parties;
  - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
  - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00.
- .6 Training: Refer to Section 01 79 00.

### 1.6 AS-BUILTS AND SAMPLES

- .1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Amendments and addenda.
  - .4 Change Orders and other modifications to the Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.
- .6 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to Departmental Representative on completion of work. Submit files on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.
- .7 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT".

### 1.7 RECORDING ACTUAL SITE CONDITIONS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
  - .1 Measured depths of elements of foundation in relation to finish first floor datum.
  - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .3 Measured locations of internal utilities and appurtenances, referenced

to visible and accessible features of construction.

- .4 Field changes of dimension and detail.
- .5 Changes made by change orders.
- .6 Details not on original Contract Drawings.
- .7 References to related shop drawings and modifications.

- .5 Specifications: legibly mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Amendments and change orders.

## 1.8 FINAL SURVEY

- .1 Not Used.

## 1.9 EQUIPMENT AND SYSTEMS

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test reports as specified in Section 01 45 00.
- .15 Additional requirements: As specified in individual specification sections.

#### 1.10 MATERIALS AND FINISHES

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional Requirements: as specified in individual specifications sections.

#### 1.11 SPARE PARTS

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

#### 1.12 MAINTENANCE MATERIALS

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

### 1.13 SPECIAL TOOLS

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

### 1.14 STORAGE, HANDLING AND PROTECTION

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

### 1.15 WARRANTIES AND BONDS

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
- .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Certificate of Substantial Performance is determined.
- .5 Verify that documents are in proper form, contain full information, and are notarized.
- .6 Co-execute submittals when required.
- .7 Retain warranties and bonds until time specified for submittal.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Procedures for demonstration and instruction of equipment and systems to Owner's O&M personnel.
- .2 O&M personnel includes property facility manager, building operators, maintenace staff, security staff and technical specialists, as applicable.

### 1.2 NOT USED

- .1 Not Used.

### 1.3 DESCRIPTION

- .1 Demonstrate scheduled operation and maintenance of equipment and systems to Departmental Representative's personnel two weeks prior to date of substantial performance.
- .2 Departmental Representative will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.

### 1.4 QUALITY CONTROL

- .1 When specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct Owner's personnel, and provide written report that demonstration and instructions have been completed.
- .2 Submit training schedule of time and date for demonstration and training of each item of equipment and each system in accordance with the training plan four weeks prior to designated dates, for Departmental Representative's approval.
- .3 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .4 Report shall give time and date of each demonstration and training, with list of persons present.

### 1.5 PREPARATION

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

## 1.6 DEMONSTRATION AND INSTRUCTIONS

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

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

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

### 1.2 RELATED SECTIONS

- .1 Section 01 21 00 - Allowances.

### 1.3 QUALITY ASSURANCE

- .1 Co-operate with testing organization services under provisions specified in Section 01 45 00.
- .3 Comply with applicable procedures and standards of the certification sponsoring association.
- .4 Perform services under direction of supervisor qualified under certification requirements of sponsoring association.

### 1.4 REFERENCES

- .1 Associated Air Balance Council (AABC): National Standards For Field Measurements and Instrumentation, Total Systems Balance, Air Distribution-Hydraulics Systems, 2002.
- .2 ASHRAE Guideline 1.1-2007, HVAC&R Technical Requirements for the Commissioning Process.
- .3 ASHRAE Guideline 4-2008, Preparation of Operating and Maintenance Documentation for Building System.
- .4 NEBB Procedural Standards for Building Systems Commissioning (1999).
- .5 NETA Standard for Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems 2009.

### 1.5 SUBMITTALS

- .1 Within 15 working days of Award of Contract, submit name of Testing organization proposed to perform services who has managerial responsibilities for coordination of all commissioning activities.

- .2 Submit documentation to confirm Testing organization compliance with quality assurance provision.
- .3 Submit 3 preliminary specimen copies of each type of startup checklist, product information and performance verification report forms proposed for use.
- .4 Submit completed report forms within 3 days after completion of each testing to Consultant for review and verification.
- .5 Fifteen days prior to Substantial Performance, submit 3 copies of final reports on applicable forms for functional performance verification.
- .6 Submit post-commissioning reports of testing, adjusting, and balancing postponed due to seasonal, climatic, occupancy, or other reasons beyond Contractor's control, promptly after execution of those services.
- .7 Submit all other commissioning documentation in accordance with Section 01 91 01.

#### 1.6 REPORT FORMS

- .1 Testing organization shall make reports.
- .2 Report forms shall include:
  - .1 Startup Checklists.
  - .2 Product Information (PI) Report forms.
  - .3 Performance Verification (PV) Report forms.
- .3 Ensure each form bears signature of recorder, and that of supervisor of reporting organization.
- .4 Submit signed form to Consultant for review and approval. After approval, immediately submit form bearing Consultant's signature to Departmental Representative.
- .5 Submit signed form to Departmental Representative for review, approval and signature.
- .6 Identify each instrument used for testing, adjusting and balancing and its latest date of calibration.

#### 1.7 CONTRACTOR'S RESPONSIBILITIES

- .1 Prepare each system for testing and balancing.
- .2 Cooperate with testing organization and provide access to equipment and systems.
- .3 Provide personnel and operate systems at designated times, and under conditions required for proper testing, adjusting, and balancing.

- .4 Notify testing organization and Departmental Representative 7 days prior to time project will be ready for testing, adjusting, and balancing.
- .5 Accurately record data for each step.
- .6 Report to Departmental Representative any deficiencies or defects noted during performance of services.
- .7 Correct deficiencies identified in accordance with Departmental Representative's written instructions.

### 1.8 PREPARATION

- .1 Provide instruments required for testing, adjusting, and balancing operations.
- .2 Make instruments available to Departmental Representative to facilitate spot checks during testing and functional performance verification.
- .3 Retain possession of instruments and remove at completion of services.
- .4 Verify systems installation is complete and in continuous operation.
- .5 Verify lighting is turned on when lighting is included in cooling load.
- .6 Verify equipment such as computers, laboratory and electronic equipment are in full operation when these equipment are included in cooling load.

### 1.9 EXECUTION

- .1 Test equipment, balance distribution systems, and adjust devices for HVAC systems.

### 1.10 NOT USED

- .1 Not Used.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED  
SECTIONS

- .1 Section 07 90 00: Joint sealing.

1.2 SAMPLES

- .1 Submit one 600 x 600 mm size samples of siding and material, of colour and profile specified.

1.3 PRODUCT DATA

- .1 Submit product data sheets in accordance with Section [01 33 00].
- .2 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, soffits, fascia, and related work on shop drawings for consultant review prior to fabrication.
- .3 Indicate conformance with CAN/CSA-S136-07.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Sheet Steel: Fabricated from Z275 0.76 mm thick galvanized sheet steel conforming to ASTM A653M Grade 230 or AZ150 Galvalume, sheet steel conforming to ASTM A792M Grade 230. Panel profile and size to match existing and be approved by Departmental Representative.
- .2 Girts: Conform to CSA G40.21-M87 hot dipped galvanized. Individual length not to exceed 6000mm.
- .3 Sub-girts: Minimum 1.21 mm (0.048") thick formed galvanized steel, ASTM A653M Grade 230 with Z275 zinc coating.
- .4 Shims: Hot dipped galvanized steel plates.
- .5 Flashing and Trim: 0.64 mm powder coated steel to match existing siding. All flashing and trim to have folded edges where exposed.
- .6 Siding Fasteners: #14 x 0.75" hex head, self-tapping AB threaded screws with colour matching nylon coated head and 9/16" washer with EPDM seal. All metal to be zinc plated. Manufacturer to provide 20 year warranty against rust of head. All faces fasteners shall be prefinished to match the colour of the siding panel.
- .7 Blind Rivets: 3mm diameter stainless steel with colour matching head.

- .8 Insulation: 50mm thick non-combustible mineral wool fibre insulation for use in cavity wall applications conforming to CAN/ULC-S702
- .9 Spun Polyolefin Paper conforming to ASTM E2178 (air penetration resistance) and ASTM E96-05 (water vapour transmission).

### PART 3 - EXECUTION

#### 3.1 DESIGN PRINCIPLE

The construction shall provide:

- .1 Such gaskets, baffles, overlaps and seals as required to provide a "Rain Screen" barrier to effectively deter rain water entry into the cavities of the system, and to prevent entry of any water into building cavities or rooms.
- .2 Sufficient openings through the cladding of sufficient cross-section to provide pressure equalization. All openings must be effectively baffled or otherwise guarded to minimize direct water entry, and entry of insects.
- .3 Adequate drainage of water and condensate to exterior from rain screen cavity. Ensure weepers, vents and drain holes are located in such positions so as to permit free drainage of cavity.

#### 3.2 PERFORMANCE REQUIREMENTS

- .1 There shall be no water infiltration into the building through the cladding system under design wind loads specified by the NBCC.
- .2 Design wind loads shall be as calculated from the Building Code based on 50 year probability.
- .3 Design and fabricate brackets and anchorage devices so that when installed will:
  - .1 Compensate for unevenness and dimensional differences in structure to which they are secured.
  - .2 Allow full expansion and contraction of framing members without causing stress within the assembly as a result of such expansion and contraction.

#### 3.3 FABRICATION

- .1 Construct and assemble to heights as indicated on drawings to incorporate breaks in panels and install flashing making a strong, watertight assembly capable of being handled to and on site.

- .2 Cope, notch and drill so as to provide minimum tolerance throughout system and to fit with hairline joints.
- .3 Conceal interconnecting members and fastenings in completed assembly.
- .4 Provide joints for vertical expansion and contraction as necessary.
- .5 Reinforce total panel as required to prevent oil canning effect and to meet specified design requirement.
- .6 Do not cross-break panel faces.
- .7 Install air cut-offs in continuous vertical members to prevent stack effect of closed air Columns.

### 3.4 INSULATION

- .1 Apply adhesive in vertical serpentine strips to insulation. Apply only as much as will be covered by insulation board before adhesive "skins".
- .2 Start at end of horizontal row. Place boards with long dimension horizontally. Butt all boards tightly. Do not get adhesive between boards.
- .3 Stagger all vertical joints. Interlock at corners.
- .4 Fill any gaps with spray foam approved by manufacturer.
- .5 Once adhesive is set, rasp surface of insulation to create smooth, even surface.
- .6 Protect insulation from damage.

### 3.5 CLADDING AND FRAMING SUPPORT

.1 Securely install components so that they line up square, in true straight flat or flush planes, plumb and level, free from distortion and to the following tolerances:

- .1 Offset from true alignment between continuous metal members within one bay no greater than 1mm total.
- .2 Offset from true alignment between continuous metal members of adjacent bay assemblies no greater than 1mm total.
- .3 Deviation of misalignment from plumb, square or true line of any metal face no greater than 1mm total.
- .4 Rack, twist or warp, within any bay, from plumb no greater than 1mm total.
- .5 Tolerances shall be non-cumulative and measured when ambient external air temperature is between 18°C and 30°C, wind speed up to 15 mph at ground level.

- .2 Make joints neat and fine as practicable. Allow for full expansion and contraction with all components and at interface with adjacent materials. Take into account climatic conditions at time of installation.
- .3 Comply with details shown on shop drawings in all aspects:
  - .1 supports
  - .2 fasteners
  - .3 anchors
  - .4 venting
- .4 Fasten metal siding with intermediate supports. The spacing of intermediate supports to be determined by engineering design.
- .5 Allow for expansion control in system to compensate for expansion and contraction of building components and the building expansion joint. Provide expansion joint profile of panel system where building expansion joints encountered.
- .6 Supply and install all flashings required to properly drain the cavities in the wall system. Install flashings such that they will never be displaced, creep or jam, and not constitute a source of noise.
- .7 Use concealed fasteners except as indicated on the drawings.
- .8 Integrate all existing mounted fixtures, electrical outlets, downspouts, exhaust vents, etc. into new siding so they do not drain behind cladding. Support adequately for secure fixing.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 CSA B111, Wire Nails, Spikes and Staples.
- .2 CAN/CSA G164-M81, Hot Dip Galvanizing of Irregularly Shaped Articles
- .3 CGSB 93-GP-5 "Installation of Residential Siding, Soffits, and Fascia"
- .4 Factory Mutual Loss Prevention Data Sheet 1-49
- .5 SMACNA (Sheet metal and Air Conditioning Contractors National Associations Inc.), latest edition

1.2 INSTALLER  
QUALIFICATIONS

- .1 Sheet metal mechanics shall be certified by Provincial certification program for sheet metal work.
- .2 Maximum ratio of sheet metal mechanics to apprentices is 1 to 1.

PART 2 - PRODUCTS

2.1 SHEET METAL  
MATERIALS

- .1 Fastening Strips: 20 gauge galvanized sheet metal. Or for low rise buildings without suspended access anchor, a standard drip edge and with normal wind resistance requirements, use fastening strips 2 gauges heavier than the sheet metal (e.g., use a 24 gauge fastening strip with 26 gauge sheet metal or a 22 gauge fastening strip with 24 gauge sheet metal).
- .2 Finished Sheet Metal: 24 gauge galvanized prefinished sheet steel sized to project requirements. To meet or exceed CGSB 93-GP-3M "Sheet Steel Galvanized Prefinished Residential". Any chipped, scratched or dented material shall be rejected. Light scuffs can be buffed and/or sprayed on site with colour matched paint supplied by the sheet metal coating manufacturer, only where permitted by the Consultant. Colour to match existing, to be approved by Owner and Consultant. Shop painting of sheet metal is not allowed.
- .3 Fasteners: of same material as sheet metal, to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing application.

### PART 3 - EXECUTION

#### 3.1 FABRICATION

- .1 Use competent sheet metal mechanics and work accurately to details indicated and specified.
- .2 Construct all joints between sheet metal panels as S-Pocket type joints. Install sheet metal sections in 2400mm maximum lengths or as otherwise shown on the drawings. Reduce length to 1200mm maximum at all perimeter roof corners.
- .3 Form bends with straight sharp lines. Double back exposed edges a minimum of 13mm for stiffness to form a hemmed edge. Leave no raw edged metal exposed.
- .4 Hem metal edge and add degree crimp in metal to add stiffness, where required.
- .5 Reduce metal panel lengths to 1200mm at areas of clad walls or interior of parapet where heights exceed 600mm.
- .6 Form fastening strip to suit sheet metal profile.
- .7 Form drip edges with at a maximum of 30 degrees to form a minimum drip clearance distance of 13mm.
- .8 Form exterior fascia face with maximum dimension of 200mm. Form fascia in multiple sections where fascia dimensions are in excess of 200mm with independent fastening strip at each section. Provide profile as shown in the drawings
- .9 Interior fascia face on canted eave or parapet to have maximum unsecured dimension of 75mm.
- .10 Fabricate all flashing in a sheet metal shop. Only fabricate mitre joints at flashing corners on site.

#### 3.2 INSTALLATION

- .1 Ensure that all horizontal surfaces have positive slope. Panned surfaces are not acceptable.
- .2 Install sheet metal in conformance with CAN/CGSB-93.5-92 "Installation of Residential Siding, Soffits, and Fascia", Factory Mutual Loss Prevention Data Sheet 1-49 and the latest edition of SMACNA (Sheet metal and Air Conditioning Contractors National Associations, Inc.)
- .3 Provide membrane flashing under all sheet metal caps over a solid substrate. Drain the membrane to the interior of the roof. Provide a minimum of 8% slope.

Lap all joints and fully bond to substrate. Lap end joint over main roof upturn membrane.

- .4 All horizontal mitres are to be single lock standing seams as per formed metal copings by SMACNA.
- .5 All vertical mitres are to be double corner seams as per formed metal copings by SMACNA.

### 3.3 SECUREMENT

- .1 Fastening strips shall be secured at 400mm on centre with No. 8 (4mm) minimum screws with a 19mm embedment.
- .2 Sheet metal cap or counter flashing at the inside edge of parapet, as detailed, shall be secured with exposed No. 10 (5mm) hex head screws with EPDM washers at 500mm on centre. Secure metal above cant at canted eaves. Holes through the sheet metal shall be slotted to allow for expansion.
- .3 Secure sheet metal reglets at 900mm on centre with No. 8 (4mm) minimum masonry screws with 25mm embedment (embedment).
- .4 Secure each S-Pocket tab with a minimum of one No. 8 (4mm) minimum screw with a 19mm embedment. Do not secure into cant.

### 3.4 CAULKING

- .1 Caulk all joints at perimeter of sheet metal which are exposed to weather or have raw edges.
- .2 Caulk intermediate joints which are not fully seamed.

END OF SECTION

PART 1 - GENERAL

1.1 ENVIRONMENTAL  
CHOICE PROGRAM

- .1 Provide sealant products bearing the 'Ecologo' of the Environmental Choice Program, Department of the Environment, Canadian Environmental Protection Act, Environmental Choice Product Guidelines ECP/PCE-45-92 for Sealants and Caulking Compounds, except maximum VOC 60 g/L during application and curing.
- .2 For primers and sealants, indicate VOC in g/L during application and curing.

1.2 PRODUCT DATA

- .1 Submit manufacturer's literature indicating recommended surface preparation, sealant selection and primer for each substrate in accordance with 01 11 00 and 01 33 00 and 01 78 00.

PART 2 - PRODUCTS

2.1 SEALANTS

- .1 Provide sealant products bearing Ecologo to ECP/PCE-45-92 with maximum VOC 60 g/L.

2.2 SEALANT  
MATERIAL  
DESIGNATIONS

- .1 Urethanes One Part '2D':
  - .1 Elastomeric, moisture curing polyurethane sealant, conforming to CAN/CGSB-19.13-M87
- .2 Silicones One Part '3':
  - .1 Elastomeric, moisture curing silicone sealant, conforming to CAN/CGSB-19.13-M87
- .3 Preformed compressible back-up materials '10', CFC free.  
Extruded polyolefin foam, non-gassing.  
Size: oversize [25%].
- .4 Bond breaker tape '12'. Polyethylene bond breaker tape which will not bond to sealant.
- .5 Void Fillers:
  - .1 Insulation for packing into large voids and cavities shall be light weight resilient, inorganic fibrous batts.
  - .2 single component, non solvenated polyurethane foam, conforming to CAN/CGSB-51.23
- .6 Cloths for solvent cleaning of surfaces prior to

application of sealants shall be clean, white, solvent resistant cloths. Coloured cloths shall not be used. Change cloths frequently as they become soiled during cleaning.

2.3 SEALANT SELECTION

- .1 Control and expansion joints in exterior surfaces of concrete walls: Designations 2D, 10.
- .2 Metal to metal joints: Designations 3, 12.

2.4 JOINT CLEANER

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
- .2 Primer: to manufacturer's recommendations.

PART 3 - EXECUTION

3.1 PREPARATION OF JOINT SURFACES

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair work.
- .3 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.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

3.2 PRIMING

- .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 BACKUP MATERIAL

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape with approximately 25% compression.

### 3.5 APPLICATION

- .1 Ventilate interior spaces during application and curing of sealants to maintain VOCs less than 50 g/l. Coordinate with building manager to ensure existing ventilation system or temporary ventilation supplies sufficient outside air.
- .2 Sealant.
  - .1 Protect installed work of other trades from staining or contamination.
  - .2 Apply sealant in accordance with manufacturer's application manual and written instructions. Maintain [SPC] [STC] rating of assemblies.
  - .3 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint. remove tape after sealant applied.
  - .4 Apply sealant in continuous beads.
  - .5 Apply sealant using gun with proper size nozzle.
  - .6 Use sufficient pressure to fill voids and joints solid.
  - .7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
  - .8 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .3 Curing.
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.
- .4 Cleanup.
  - .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 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A 653/A 653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 National Fire Protection Association (NFPA)
  - .1 NFPA 80, Standard for Fire Doors and Fire Windows.
- .3 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.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Doors:
  - .1 Supply fire doors and frame assemblies to meet fire resistance time rating specified and carry the appropriate U.L.C. label in accordance with NFPA 80.
  - .2 Doors shall be fabricated of 18 ga. wipe coat galvanized steel.
  - .3 Frames shall be fabricated of 16 ga. wipe coat galvanized steel. Frames shall be furnished with 3 rubber bumpers.
  - .4 Fire doors and frames shall be installed as tested and approved by a nationally recognized agency having a factory inspection service.
  - .5 Locate label on frame on jamb midway between top hinge and head of door frame. Provide labels on door edge, hinge side.

- .6 Doors/frames to have ZF075 zinc coating on both sides to ASTM A525M-916.
- .7 Doors to be match existing width of opening. Door jambs to match existing depth of opening.
- .2 Latch Hardware:
  - .1 UL listed lockset, orbit handle style to ANSI 156.2, Series 4000 Grade 2. 1 1/4" x 4 7/8" ANSI Square Corner T Strike, Finish: Satin Chrome.
  - .2 Provide new chains as required to hold door open by latching onto existing hooks.
- .3 Hinges:
  - .1 UL listed and steel hinges with 2 ball bearings or, hinges provided in tested door/frame assembly.
- .4 Paint Finishes:
  - .1 Touch-up prime CAN/CGSB-1.181.
  - .2 Field paint steel doors and frames in accordance with Section 09 97 13.02 - Painting Steel.

### PART 3 - EXECUTION

#### 3.1 NEW FIRE RATED DOOR.1 ASSEMBLIES

- .1 Install doors and hardware plumb, square and level in accordance with manufacturer's most recent written instruction and to NFPA 80. Intent is that pressed steel door frames are punched and dimpled for direct fastening to block walls..
- .2 Direction of door swing to match existing.
- .3 Touch up with primer scratched or damaged zinc finish.
- .4 Provide prime and finish coat of paint on doors (both sides) and frames. Colour to be selected by Owner.

END OF SECTION

PART 1 - GENERAL

1.1 ENVIRONMENTAL  
CONDITIONS

- .1 Ensure that substrate temperatures during application are a minimum of +10°C and a maximum of +35°C. Do not paint when air temperature is expected to reach 0°C before paint is dry.
- .2 Do not apply coatings while the wind speed is greater than 20km/h.
- .3 Do not apply coatings while the relative humidity is greater than 80%. The substrate temperature must be at least 5°C above the dew point while painting and curing.
- .4 Do not apply coatings in direct sunlight or during rain.

1.2 REFERENCES

- .1 The Master Painters Institute (MPI)
  - .1 Exterior Structural Steel and Metal Fabrications, [07].
    - .1 EXT 5.1D, Alkyd.
    - .2 EXT 5.1G, Polyurethane, Pigmented (over epoxy zinc rich primer and high build epoxy).
    - .3 EXT 5.4, Aluminum.
- .2 The Society for Protective Coatings (SSPC)
  - .1 SSPC-SP 1-[82(R2004)], Solvent Cleaning.
  - .2 SSPC-SP 2-[82(R2004)], Hand Tool Cleaning.
  - .3 SSPC-SP 3-[82(R2004)], Power Tool Cleaning.
  - .4 SSPC-SP 6/NACE No. 3-[07], Commercial Blast Cleaning.
  - .5 SSPC-SP 7/NACE No. 4-[07], Brush-off Blast Cleaning.
  - .6 SSPC-Vis-1-[89], Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs) Editorial Changes September 1, 2000 (Steel Structures Painting Manual, Chapter 2 - Surface Preparation Specs.).
  - .7 SSPC-SP 10/NACE No. 2-[07], Near White Blast Cleaning.
  - .8 SSPC-PA 2[04], Measurement of Dry Coat Thickness with Magnetic Gauges.
  - .9 SSPC Good Painting Practices, Volume 1, 4th Edition.

1.3 QUALITY  
ASSURANCE

- .1 Notify the Consultant for review of preparation of steel surfaces and application of coating.
- .2 Do not commence primer, or topcoat application until you receive written authorization from the department

representative .

- .3 All coating applications shall be inspected in accordance with SSPC-PA2, Measurement of Dry Film Thickness with Magnetic Gauges, as well as ASTM D 3359, Standard Test Methods for Measuring Adhesion by Tape Test.
- .4 Arrange to have coating manufacturer's representative visit the site prior to applying any material, in order to approve general surface preparation.
- .5 Deficiencies shall be repaired in accordance with manufacturer's written instructions.
- .6 Inspection and testing of work done to repair deficiencies shall be paid for by the Contractor.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 General:
  - .1 Paint materials to be products of a single manufacturer and designated by that manufacturer to be compatible with the existing conditions and to each other.
  - .2 The paint used on this project shall be for exterior application.
  - .3 All primers and base coats shall be tinted to a colour contrasting with the coats that follow..
  - .4 All materials delivered to the site must be in the original containers with unbroken seals and intact labels clearly identifying the product.
  - .5 Use materials in strict accordance with the manufacturer's specifications and requirements.
  - .6 Paint colours will be selected by the Owner on site.
- .2 Epoxy Primer: rust inhibitive high build epoxy primer.
  - .1 Primer for second coat: tinted sufficiently off finish colour of first coat to show where second coat is applied.
  - .2 Tinting material: compatible with primer and not detrimental to its service life.
- .3 Aliphatic Polyurethane Finish Coat: low VOC, aliphatic, acrylic polyurethane resin coating.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Surface preparation and painting of metal surfaces shall be done in accordance with the relevant Structural Steel Painting Council (SSPC) Specification, and the requirements of this Specification.
- .2 Remove deleterious materials including:
  - .1 all particles of dirt, rust, dust, chalk, mildew, grease, oil and any other deleterious materials which are detrimental to good bond by approved methods.
  - .2 all loose, flaking, blistered, deteriorated or otherwise unsound paint by approved methods.
  - .3 Prepare all rusted surfaces by blasting to SSPC-SP10 (Near White). Produce a smooth, clean surface without rust in pits and without rough edges or protrusions.

3.2 SITE PREPARATION

- .1 Mask over adjacent surfaces as required to produce neat and true paint lines at discontinuous edges.
- .2 Protect adjacent surfaces and surfaces below from dripping, overspray etc.
- .3 Install "WET PAINT" signs.
- .4 Enclose areas below the work to prevent access to pedestrians. Be responsible for any paint spilled on vehicles or other objects below the work area.

3.3 MATERIAL  
PREPARATION

- .1 Mix well before using.
- .2 Withdraw from original container only as much material as can be used in one day. Do not return unused material to original container.
- .3 Maintain containers closed if not extracting paint.
- .4 For thinning, use only those materials permitted by the Consultant and approved by the manufacturer.

3.4 APPLICATION OF  
PRIMER COAT

- .1 Mix thoroughly to manufacturer's instructions.
- .2 Apply primer coat to all metal surfaces that were exposed by surface preparation.
- .3 Apply primer to exceed the minimum dry film thickness (DFT).

3.3 APPLICATION

- .1 Apply in strict accordance with manufacturer's requirements. Do not use any other paint application methods unless prior written approval is obtained from the department representative .
- .2 Apply base coat and finish coats to all surfaces to exceed the minimum DFT specified.
- .3 The dried finish coat shall be uniform in appearance, colour, and gloss. The "lap-in" areas shall exhibit uniformity with the adjacent painted areas. The finish shall be free of dirt, coarse particles, or any other foreign matter.
- .4 The final finish coat shall completely cover in one application. The Contractor shall touch-up areas which were not properly coated the first time.

END OF SECTION