

# **SPECIFICATIONS**

## **WARKWORTH GATES AND BARRIERS**

**For**

**PWGSC**

**Project No.: R.074854.001**

**Date:**           **October 2, 2017**  
**Project N°**   **15094**



Section Title Pages

DIVISION 01 - GENERAL REQUIREMENTS

01 14 00	WORK RESTRICTIONS
01 14 10	CORRECTIONAL SERVICE CANADA SECURITY REQUIREMENTS
01 29 83	PAYMENT PROCEDURES: TESTING LABORATORY SERVICES
01 31 19	PROJECT MEETINGS
01 32 16.06	CONSTRUCTION PROGRESS SCHEDULE - CRITICAL PATH METHOD (CPM)
01 32 16.07	CONSTRUCTION PROGRESS SCHEDULE - BAR (GANTT) CHART
01 33 00	SUBMITTAL PROCEDURES
01 35 13	SPECIAL PROJECT PROCEDURES FOR CORRECTIONAL SERVICE CANADA SECURITY REQUIREMENT
01 35 29	HEALTH AND SAFETY REQUIREMENTS
01 35 43	ENVIRONMENTAL PROCEDURES
01 41 00	REGULATORY REQUIREMENTS
01 45 00	QUALITY CONTROL
01 51 00	TEMPORARY UTILITIES
01 52 00	CONSTRUCTION FACILITIES
01 56 00	TEMPORARY BARRIERS AND ENCLOSURES
01 61 00	COMMON PRODUCT REQUIREMENTS
01 73 00	EXECUTION
01 74 11	CLEANING
01 74 20	CONSTRUCTION/DEMOLITION WASTE MANAGEMENT AND DISPOSAL
01 77 00	CLOSEOUT PROCEDURES
01 78 00	CLOSEOUT SUBMITTALS
01 91 00	COMMISSIONING - GENERAL REQUIREMENTS

DIVISION 02 - EXISTING CONDITIONS

02 41 99	DEMOLITION
----------	------------

DIVISION 03 - CONCRETE

03 30 00	CAST-IN-PLACE CONCRETE
----------	------------------------

DIVISION 05 - METALS

05 50 00	METAL FABRICATIONS
----------	--------------------

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 84 00	FIRE STOPPING
----------	---------------

DIVISION 09 - FINISHES

09 91 23	PAINTING
----------	----------

DIVISION 11 - EQUIPMENT

11 19 12	DETENTION HARDWARE
11 19 12.01	DETENTION HARDWARE SCHEDULE
11 19 13	DETENTION DOORS PANELS AND FRAMES

DIVISION 26 - ELECTRICAL

26 05 00	COMMON WORK RESULTS FOR ELECTRICAL
26 05 20	WIRE AND BOX CONNECTORS (0 - 1000V)
26 05 34	CONDUITS, CONDUIT FASTENINGS AND CONDUIT FITTINGS
26 28 16.02	MOULDED CASE CIRCUIT BREAKERS
26 29 03	CONTROL DEVICES

DIVISION 31 - EARTHWORK

31 23 33.01 EXCAVATING, TRENCHING AND BACKFILLING

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 12 16.02 ASPHALT PAVING FOR BUILDING SITES

32 31 13 CHAIN LINK FENCES AND GATES

LIST OF DRAWINGS

A0	LEGEND AND LIST OF DRAWINGS
A1	SITE & KEY PLAN
A2	ELEVATIONS & DETAILS
A3	VEHICLE GATE ELEVATIONS
E1	KEY PLAN
E2	FLOOR PLANS AND DETAILS
E3	ELEVATIONS & DETAILS
E4	CONTROL PANEL AND DETAIL
E5	DETAILS

END

PART 1 - GENERAL

1.1 EXISTING  
SERVICES

- .1 Notify Departmental Representative and 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 personnel and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00.

1.2 SCHEDULING

- .1 Coordinate with the Departmental Representative to minimize user interference and to ensure continuity of security throughout construction.
- .2 Site will be occupied continuously throughout construction, including nights and weekends.
- .3 Sallyport hours are between 0800 hours and 1145 hours, and between 1230 hours and 1545 hours.
- .4 Execute work on man doors one door at a time, such that each door is fully secure and operational before work is started on the next door. Painting and finishing work may be completed subsequently, but still only one door at a time so that only one door is out of service at any given time.
- .5 Execute work on sliding grille barriers one barrier at a time, such that each barrier is fully secure and operational before work is started on the next barrier. Painting and finishing work may be completed subsequently, but still only one barrier at a time so that only one barrier is out of service at any given time.

1.2 SCHEDULING  
(Cont'd)

- .6 As noted on Drawings, work on sliding grille barriers B1 & B2 is to be executed between the 2300 hours and 0600 hours, with installation of each barrier being completed in one night. By 0600 hrs, the barrier must be capable of being manually locked with a chain and padlock (which will be provided by Owner). Electrical work and painting may be completed during regular daytime hours.
- .7 As noted on drawings, work on man door D6 is to be expected between 1900 hours and 0600 hours, with complete door replacement being completed in one night. Painting may be completed the following night during the same time frame.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

PART 1 - GENERAL

- 1.1 PURPOSE .1 To ensure that both the construction project and the institutional operations may proceed without undue disruption or hindrance.
- 1.2 DEFINITIONS .1 "Contraband" means:  
.1 An intoxicant.  
.2 A weapon or a component thereof, ammunition for a weapon, and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization.  
.3 An explosive or a bomb or a component thereof.  
.4 Currency over any applicable prescribed limit, when possessed by an inmate without prior authorization.  
.5 Any item not described in paragraphs 2.1.1 to 2.1.4 that could jeopardize the security of a Penitentiary or the safety of persons, when that item is possessed without prior authorization.
- .2 "Commercial Vehicle" means any motor vehicle used for the shipment of material, equipment and tools required for the construction project.
- .3 "CSC" means Correctional Service Canada.
- .4 "Director" means Director, Warden or Superintendent of the Institution as applicable.
- .5 "Construction Employees" means persons working for the General Contractor, the sub-contractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.
- .6 "Departmental Representative" means the project manager from Public Works and Government Services Canada.
- .7 "Perimeter" means the fenced or walled area of the Institution that restrains the movement of the inmates.
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<u>1.2 DEFINITIONS</u> (Cont'd)	.8	"Construction Limits" means the area as shown on the contract drawings that the Contractor will be allowed to work". This area may or may not be isolated from the security area of the Institution.
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<u>1.3 PRELIMINARY PROCEEDINGS</u>	.1	Prior to the commencement of work, the Contractor shall meet with the Director or his representative to: .1 Discuss the nature and extent of all activities involved in the Project. .2 Establish mutually acceptable security procedures in accordance with this instruction and the institution's particular requirements.
	.2	Contractor shall: .1 Ensure that all Construction Employees are aware of the security requirements. .2 Ensure that a copy of the security requirements is always prominently on display at the job site. .3 Co-operate with institutional personnel in ensuring that security requirements are observed by all Construction Employees.

<u>1.4 CONSTRUCTION EMPLOYEES</u>	.1	Submit to the Director a list of the names with date of birth of all Construction Employees on the construction site, and a completed security clearance form and a photocopy of picture ID and driver's license for each employee.
	.2	Security clearances will be processed immediately. CPIC's typically take two weeks to be processed. Employees will not be admitted to the Institution without a valid security clearance in place and a recent picture identification such as a provincial driver's license. Security clearances obtained from other CSC Institutions are not valid at this Institution.

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1.4 CONSTRUCTION  
EMPLOYEES  
(Cont'd)

- .3 The Director may require that facial photographs may be taken of Construction Employees and these photographs may be displayed at appropriate locations in the Institution or in an electronic database for identification purposes. The Director may require that these photographs be displayed prominently on the Construction Employees clothing while employees are in the Institution.
- .4 Entry to Institutional Property will be refused used to any person there may be reason to believe may be a security risk.
- .5 Any person employed on the construction site will be subject to immediate removal from Institutional Property if they:
  - .1 Appear to be under the influence of alcohol, drugs or narcotics.
  - .2 Behave in an unusual or disorderly manner.
  - .3 Are in possession of contraband.

1.5 VEHICLES

- .1 All unattended vehicles on CSC property shall have windows closed; doors and trunks shall be locked and keys removed. The keys shall be securely in the possession of the owner or an employee of the company that owns the vehicle.
- .2 The Director may limit at any time the number and type of vehicles allowed within the Institution.
- .3 Drivers of delivery vehicles for material required by the project will not require security clearances but must remain with their vehicle the entire time that the vehicle is in the Institution. The Director may require that these vehicles be escorted by Institutional Staff or Commissionaires while in the Institution.
- .4 No trailers will be permitted inside the institution overnight.

1.6 PARKING

- .1 Parking Area(s) to be used by Construction Employees where indicated. Parking in other locations will be prohibited and vehicles may be subject to removal.

1.7 SHIPMENTS .1 All shipments of project material, equipment and tools shall be addresses in the Contractor's name to avoid confusion with the Institution's own shipments. The Contractor must have his/her own employees on site to receive any deliveries or shipments. CSC staff will NOT accept receipt of deliveries or shipments of any material equipment or tools.

1.8 TELEPHONES .1 The installation of telephones, facsimile machines and computers with Internet connections requires the prior approval of the Director.

.2 The Director will ensure that approved telephones, facsimile machine and computers with internet connections are located where they are not accessible to inmates. All computers will have an approved password protection that will stop an internet connection to unauthorized personnel.

.3 Wireless cellular and digital telephones are not permitted within the Institution unless approved by the Director. If wireless cellular telephones are permitted, the user will not permit their use by any inmate.

.4 The Director may approve but limit the use of two way radios.

1.9 WORK HOURS .1 Work hours within the Institution are: Monday to Friday 0730 hrs to 1600 hrs. Except as specifically indicated elsewhere in the Contract, and as approved in accordance with Paragraph 1.10 below, all work shall be executed during these working hours.

.2 Work will not be permitted during weekends and statutory holidays without the permission of the Director. A minimum of seven days advance notice will be required to obtain the required permission.

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- 1.10 OVERTIME WORK
- .1 No overtime work will be allowed without permission of the Director. Give a minimum forty-eight (48) hours advance notice when overtime work on the construction project is necessary and approved. If overtime work is required because of an emergency, such as the completion of a concrete pour or work to make the construction safe and secure, the Contractor shall advise the Director as soon as this condition is known and follow the directions given by the Director. Costs to the Crown for such events may be attributed to the Contractor.
  - .2 When overtime work, weekend, or statutory holiday work is required and approved by the Director, extra staff members may be posted by the Director or his designate, to maintain the security surveillance. The Departmental Representative may post extra staff for inspection of construction activities. The actual cost of this extra staff may be subject to reclamation by the Crown.
- 1.11 TOOLS AND EQUIPMENT
- .1 Maintain a complete list of all tools and equipment to be used during the construction project. Make this inventory available for inspection when required.
  - .2 Throughout the construction project maintain up-to-date the list of tools and equipment specified above.
  - .3 Keep all tools and equipment under constant supervision, particularly power-driven tools, files, saw blades, rod saws , wire, rope, ladders and any sort of jacking device.
  - .4 No power activated tools will be permitted.
  - .5 Store all tools and equipment in approved secure locations.
  - .6 Lock all tool boxes when not in use. Keys to remain in the possession of the employees of the contractor.
  - .7 All missing or lost tools or equipment shall be reported immediately to the Director.
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1.11 TOOLS AND  
EQUIPMENT  
(Cont'd)

- .8 The Director will ensure that the security staff members carry out checks of the Contractor's tools and equipment against the list provided by the Contractor. These checks will be carried out daily.
- .9 Certain tools/equipment such as cartridges and hacksaw blades are highly controlled items. The Contractor will be given at the beginning of the day, a quantity that will permit one day's work. Used blades/cartridges will be returned to the Director's representative at the end of each day.
- .10 If propane or natural gas is used for heating the construction, the Institution may require that an employee supervise the construction site during non-working hours.

1.12 KEYS

- .1 Security Hardware Keys:
  - .1 The Contractor shall arrange with the security hardware supplier/installer to have the keys for the security hardware to be delivered directly to the institution, specifically the Security Maintenance Officer (SMO).
  - .2 The Security Maintenance Officer (SMO) will provide a receipt to the Contractor for security hardware keys.
  - .3 The Contractor will provide a copy of the above-mentioned receipt to the Departmental representative.
- .2 Other Keys:
  - .1 The Contractor will use standard construction cylinders for locks for his use during the construction period.
  - .2 The Contractor will issue instructions to his employees and sub-trades, as necessary, to ensure safe custody of the construction set of keys.
  - .3 Upon completion of each phase of the construction, the CSC representative will, in conjunction with the lock manufacturer:
    - .1 Prepare an operational keying schedule.
    - .2 Accept the operational keys and cylinders directly from the lock manufacturer
    - .3 Arrange for removal and return of the construction cores and install the operational core in all locks.

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|----------------------------|----|---|
| 1.12 KEYS<br>(Cont'd)      | .2 | (Cont'd)  |
|                            | .3 | (Cont'd)  |
|                            | .3 | Upon putting operational security keys into use, the CSC construction escort shall obtain these keys as they are required from the Security Maintenance Officer (SMO) and open doors as required by the Contractor. The Contractor shall issue instructions to his employees advising them that all security keys shall always remain with the CSC construction escort. |
| 1.13 SECURITY<br>HARDWARE  | .1 | Turn over all removed security hardware to the Director of the Institution for disposal or for safekeeping until required for re-installation.  |
| 1.14 PRESCRIPTION<br>DRUGS | .1 | Employees of the Contractor who are required to take prescription drugs during the workday shall obtain approval of the Director to bring a one day supply only into the Institution.   |
| 1.15 CONTRABAND            | .1 | Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are prohibited on Institutional Property.   |
|                            | .2 | Discovery of Contraband on the construction site and the identification of the person(s) responsible for the Contraband shall be reported immediately to the Director.  |
|                            | .3 | Contractors shall be vigilant with both their staff and the staff of their sub-contractors and suppliers that the discovery of Contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the Institution for the duration of the construction.                        |
|                            | .4 | Presence of arms and ammunition in vehicles of Contractors, sub-contractors and suppliers or employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.   |
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#### 1.16 SEARCHES

- .1 All vehicles and persons entering Institutional property may be subject to search.
- .2 When the Director suspects, on reasonable grounds, that an employee of the Contractor is in possession of Contraband, he may order that person to be searched.
- .3 All employees entering the Institution may be subject to screening of personal effects for traces of Contraband drug residue.

#### 1.17 ACCESS TO AND REMOVAL FROM INSTITUTION PROPERTY

- .1 Construction personnel and commercial vehicles will not be admitted to the Institution after normal working hours, unless approved by the Director.

#### 1.18 MOVEMENT OF VEHICLES

- .1 Escorted commercial vehicles will be allowed to enter or leave the Institution through the vehicle access gate during the following hours:
    - .1 07:45 a.m. to 11:00 a.m.
    - .2 1:00 p.m. to 3:30 p.m.
  - .2 Construction vehicles shall not leave the Institution until an inmate count is completed.
  - .3 The Contractor shall advise the Director forty-eight (48) hours in advance to the arrival on the site of heavy equipment such as concrete trucks, cranes, etc.
  - .4 Vehicles being loaded with soil or other debris, or any vehicle considered impossible to search, must be under continuous supervision by CSC Staff or Commissionaires working under the authority of the Director.
  - .5 Commercial Vehicles will only be allowed access to Institutional Property when their contents are certified by the Contractor or his/her representative as being strictly necessary to the execution of the construction project.
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1.18 MOVEMENT OF  
VEHICLES  
(Cont'd)

- .6 Vehicles shall be refused access to Institutional Property if, in the opinion of the Director, they contain any article which may jeopardize the security of the Institution.
- .7 Private vehicles of Construction Employees will not be allowed within the security wall or fence of medium or maximum security Institutions without the permission of the Director.
- .8 With prior approval of the Director, a vehicle may be used in the morning and evening to transport a group of employees to the work site. This vehicle will not remain within the Institution the remainder of the day.
- .9 With the approval of the Director, certain equipment may be permitted to remain on the construction site overnight or over the weekend. This equipment must be securely locked, with the battery removed. The Director may require that the equipment be secured with a chain and padlock to another solid object.

1.19 MOVEMENT OF  
CONSTRUCTION  
EMPLOYEES ON  
INSTITUTIONAL  
PROPERTY

- .1 Subject to the requirements of good security, the Director will permit the Contractor and his employees as much freedom of action and movement as is possible.
- .2 However, notwithstanding paragraph above, the Director may:
  - .1 Prohibit or restrict access to any part of the Institution.
  - .2 Require that in certain areas of the Institution, either during the entire construction project or at certain intervals, Construction Employees only be allowed access when accompanied by a member of the CSC security staff.
- .3 During the lunch and coffee breaks, all employees will remain within the construction site. Employees are not permitted to eat in the officer's lounge and dining room.

- 1.20 SURVEILLANCE AND INSPECTION
- .1 Construction activities and all related movement of personnel and vehicles will be subject to surveillance and inspection by CSC security staff members to ensure that established security requirements are met.
  - .2 CSC staff members will ensure that an understanding of the need to carry out surveillance and inspections, as specified above, is established among Construction Employees and maintained throughout the construction project.
- 1.21 STOPPAGE OF WORK
- .1 The Director may request at any time that the Contractor, his employees, sub-contractors and their employees not enter or leave the work site immediately due to a security situation occurring within the Institution. The Contractor's site supervisor shall note the name of the staff member making the request and the time of the request and obey the order as quickly as possible.
  - .2 The Contractor shall advise the Departmental representative within 24 hours of this delay to the progress of the work.
- 1.22 CONTACT WITH INMATES
- .1 Unless Specifically authorized, it is forbidden to come into contact with inmates, to talk with them, to receive objects from them or to give them objects. Any employee doing any of the above will be removed from the site and his/her security clearance revoked.
  - .2 It is forbidden to take pictures of inmates, of CSC staff members or of any part of the Institution other than those required as part of this Contract.
- 1.23 COMPLETION OF CONSTRUCTION PROJECT
- .1 Upon completion of the construction project or, when applicable, the takeover of a facility, the Contractor shall remove all remaining construction material, tools and equipment that are not specified to remain in the Institution as part of the construction contract.



PART 1 - GENERAL

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| 1.1 RELATED<br>REQUIREMENTS<br><u>SPECIFIED ELSEWHERE</u> | .1 | Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.   |
| 1.2 APPOINTMENT AND<br><u>PAYMENT</u>                     | .1 | Departmental Representative will appoint and pay for services of testing laboratory except follows:<br>.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.<br>.2 Inspection and testing performed exclusively for Contractor's convenience.<br>.3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.<br>.4 Mill tests and certificates of compliance.<br>.5 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.<br>.6 Additional tests specified in the following paragraph. |
|   | .2 | Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.  |
| 1.3 CONTRACTOR'S<br><u>RESPONSIBILITIES</u>               | .1 | Provide labour, equipment and facilities to:<br>.1 Provide access to Work to be inspected and tested.<br>.2 Facilitate inspections and tests.<br>.3 Make good Work disturbed by inspection and test.<br>.4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.  |
|   | .2 | Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.   |

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|---|----|---|
| <u>1.3 CONTRACTOR'S RESPONSIBILITIES (Cont'd)</u> | .3 | Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.  |
|   | .4 | Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative. |

PART 2 - PRODUCTS

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|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

PART 3 - EXECUTION

- |                     |    |           |
|---------------------|----|-----------|
| <u>3.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

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 5 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 5 days after meetings and transmit to 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 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .3 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .4 Agenda to include:
  - .1 Appointment of official representative of participants in the Work.

1.2 PRECONSTRUCTION .4  
MEETING  
(Cont'd)

- (Cont'd)
- .2 Schedule of Work: in accordance with Section 01 32 16.06 - Construction Progress Schedule - critical path method, and Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart.
  - .3 Schedule of submission of shop drawings, samples, colour chips.
  - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities.
  - .5 Delivery schedule of specified equipment.
  - .6 Site security.
  - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
  - .8 Owner provided products.
  - .9 Record drawings.
  - .10 Maintenance manuals.
  - .11 Take-over procedures, acceptance, warranties.
  - .12 Monthly progress claims, administrative procedures, hold backs.
  - .13 Insurances, transcript of policies.

1.3 PROGRESS  
MEETINGS

- .1 During course of Work and weeks prior to project completion, schedule progress meetings monthly.
- .2 Contractor and major Subcontractors involved in Work are to be in attendance.
- .3 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 5 days after meeting.
- .4 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 Revision to construction schedule.
  - .6 Other business.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.



## PART 1 - GENERAL

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|---------------------------------|----|---|
| <u>1.1 RELATED REQUIREMENTS</u> | .1 | Section 01 31 19 Project Meetings.  |
|                                 | .2 | Section 01 32 16.7 Construction Progress Schedule - Bar (GANTT) chart.  |
| <u>1.2 REFERENCES</u>           | .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. |
|                                 | .3 | Baseline: original approved plan (for Project, work package, or activity), plus or minus approved scope changes.  |
|                                 | .4 | Cash Flow: projection of progress payment requests based on cash loaded construction schedule.  |
|                                 | .5 | Completion Milestones: they are firstly Interim Certificate Substantial Completion and secondly Final Certificate.  |
|                                 | .6 | Constraint: applicable restriction or limitation, either internal or external to project, that will affect performance of Project. Factors that affect activities can be scheduled.   |
|                                 | .7 | Control: process of comparing actual performance with planned performance, analyzing variances, evaluating possible alternatives, and taking appropriate corrective action as needed.   |
|                                 | .8 | Critical Activity: any activity on a critical path.   |
|                                 | .1 | Most commonly determined by using critical path method.   |
|                                 | .9 | Critical Path: sequence of activities that determines duration of Project. Generally, it is the longest path through Project.   |
|                                 | .1 | Usually defined as those activities with float less than or equal to specified value, often zero.   |

1.2 REFERENCES  
(Cont'd)

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- .1 (Cont'd)
- .10 Critical Path Method (CPM): network analysis technique used to determine the amount of scheduling flexibility (amount of float) on various logical network paths in Project schedule network, and to determine the minimum total Project duration.
- .11 Data Date: date through which project status and progress were last determined and reported for analyses, such as scheduling and performance measurements.
- .12 Duration: total number of work periods (not including holidays or other non-working periods) required to complete activity or other Project element.
- .1 Usually expressed as workdays or work weeks.
- .13 Early Finish Date: 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.
- .1 Early finish dates can change as Project progresses and changes are made to Project plan.
- .14 Early Start Date: 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.
- .1 Early start dates can change as Project progresses and changes are made to Project Plan.
- .15 Finish Date: point in time associated with activity's completion.
- .1 Usually qualified by one of following: actual, planned, estimated, scheduled, early, late, baseline, target, or current.
- .16 Float: amount of time that activity may be delayed from its early start without delaying Project finish date.
- .1 This resource is available to both PWGSC and Contractor.
- .17 Impact Analysis: schedule analysis technique that adds a modeled delay to an accepted construction schedule to determined possible outcome of that delay on project completion.
- .18 Lag: modification of logical relationship that directs delay in successor activity.



## 1.2 REFERENCES

(Cont'd)

.1

(Cont'd)

.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 Schedule: summary-level schedule that identifies major deliverable; work breakdowns structure and key milestones.

.24 Milestone: significant point or event in Project, usually completion of major deliverable.

.25 Monitoring: capture, analysis, and reporting of Project performance, usually as compared to plan.

.26 Non-Critical Activities: activities which when delayed, do not affect specified Contract duration.

.27 Project Control System: fully computerized system utilizing commercially available software packages.

.28 Project Network Diagram: schematic display of logical relationships of Project activities.

.1 Always drawn from left to right to reflect Project chronology.

.29 Project Plan: formal, approved document used to guide both Project execution and Project control.

.1 Primary uses of Project plan are to document planning assumptions and decisions, facilitate communication among stakeholders, and document approved scope, cost, and schedule baselines.

.2 Project plan may be summary or detailed.

.30 Project Planning: development and maintenance of Project Plan.

.31 Project Planning, Monitoring and Control System: overall system operated to enable monitoring of Project Work in relation to established milestones.

.32 Project Schedule: planned dates for performing activities and planned dates for meeting milestones.

## 1.2 REFERENCES

(Cont'd)

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- .1 (Cont'd)
  - .33 Quantified days duration: working days based on 5 day work week, discounting statutory holidays.
  - .34 Risk: uncertain event or condition that, if it occurs, has positive or negative effect on Project's objectives.
  - .35 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.
  - .36 Work Breakdown Structure (WBS): deliverable-oriented hierarchical decomposition of Work to be executed by contractor to accomplish project objectives and create required deliverables. It organizes and defines total scope of Project. Each descending level represents an increasingly detailed definition of Project Work. WBS is decomposed into Work packages.
- .2 Reference Standards:
  - .1 Project Management Institute (PMI Standards)
    - .1 A Guide to the Project Management Body of Knowledge (PMBOK Guide) - Fourth Edition.
    - .2 Practice Standard for Scheduling - 2011.

## 1.3 ADMINISTRATIVE REQUIREMENTS

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- .1 Project Meeting:
  - .1 Meet with Departmental Representative within 15 working days of Award of Contract date, to establish Work requirements and approach to project construction operations.
  - .2 Participate in regular project progress meetings with Departmental Representative specifically intended to discuss update of detailed schedule and contract changes.
- .2 Scheduling:
  - .1 Planning: 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.

1.3 ADMINISTRATIVE  
REQUIREMENTS  
(Cont'd)

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- (Cont'd)
- .2 Ensure project schedule efficiencies through monitoring 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 Monitor sufficiently often so that causes of delays can immediately be identified and removed.
- .3 Project monitoring and reporting:
- .1 Keep team aware of changes to schedule, and possible consequences as project progresses.
- .2 Use narrative reports to provide advice on seriousness of difficulties and measures to overcome them.
- .3 Begin narrative reporting with statement on general status of Project followed by summarization of delays, potential problems, corrective measures and Project status criticality.
- .4 Critical Path Method (CPM) Requirements:
- .1 Ensure Master Plan and Detail Schedule are practical and remain within specified Contract duration.
- .2 Revise Master Schedule and Detail Schedule deemed impractical by Departmental Representative and resubmit for approval.
- .3 Change to Contract Duration:
- .1 Acceptance of Master Schedule and Detail Schedule showing scheduled Contract duration shorter than specified Contract duration does not constitute change to Contract.
- .2 Duration of Contract may only be changed through bilateral Agreement.
- .4 Consider Master Schedule 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 Schedule 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 specified time periods for Contract.
- .7 Substantial Completion with "LF" constraint equal to calculated date.

1.3 ADMINISTRATIVE REQUIREMENTS (Cont'd)	.4	(Cont'd)
		.8 Calculations on updates to be such that if early finish of Interim Certificate 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.
		.1 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.
		.1 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.
		.1 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, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.
1.4 ACTION AND INFORMATIONAL SUBMITTALS	.1	Submit in accordance with Section 01 33 00 - Submittal Procedures.
	.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.

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1.4 ACTION AND  
INFORMATIONAL  
SUBMITTALS

(Cont'd)

- .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.
- .7 Submit impact analysis of schedule for changes that result in extension of contract duration.
  - .1 Include draft schedule update and report as outlined in article "PROGRESS MONITORING AND REPORTING".
- .8 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 Email 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 Schedule 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 zero and up to 5 days total float used as first sort for ready identification of critical or near 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 2 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.

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| <u>1.5 QUALITY ASSURANCE</u> | .1 | Use experienced personnel, fully qualified in planning and scheduling to provide services from start of construction to Final Certificate, including Commissioning.  |
| <u>1.6 MASTER SCHEDULE</u>   | .1 | Structure and base CPM construction networks system on WBS coding in order to ensure consistency throughout Project.   |
|                              | .2 | Prepare comprehensive construction Master Schedule (CPM logic diagram) and dependent Cash Flow Projection within 15 working days of finalizing Agreement to confirm validity or alternates of identified milestones. |
|                              | .1 | Master Schedule will be used as baseline.  |
|                              | .1 | Revise baseline as conditions dictate and as required by Departmental Representative.  |
|                              | .2 | Departmental Representative as Project progresses will review and return revised baseline within 10 work days.   |
|                              | .3 | Reconcile revisions to Master Schedule and Cash Flow Projections with previous baseline to provide continuous audit trail.   |
|                              | .4 | Initial and subsequent Master Schedule will include:   |
|                              | .1 | 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.  |
| <u>1.7 DETAIL SCHEDULE</u>   | .1 | Provide detailed project schedule (CPM logic diagram) within 15 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.  |
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- 1.7 DETAIL SCHEDULE .1 (Cont'd)
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- .6 Installation.
- .7 Site works.
- .8 Testing.
- .9 Commissioning and acceptance.
- .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 Schedule.
- .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.
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|---|----|---|
| 1.7 <u>DETAIL SCHEDULE</u><br>(Cont'd)                | .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.   |
| 1.8 <u>REVIEW OF THE CONSTRUCTION DETAIL SCHEDULE</u> | .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.  |
| 1.9 <u>COMPLIANCE WITH DETAIL SCHEDULE</u>            | .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. <ul style="list-style-type: none"> <li>.1 Corrective measures may include: <ul style="list-style-type: none"> <li>.1 Increase of personnel on site for effected activities or work package.</li> <li>.2 Increase in materials and equipment.</li> <li>.3 Overtime work, Additional work shifts.</li> </ul> </li> </ul> |
|   | .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:  |
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1.9 COMPLIANCE WITH .4  
DETAIL SCHEDULE  
(Cont'd)

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- (Cont'd)
- .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 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.

1.10 PROGRESS  
MONITORING AND  
REPORTING

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- .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 twice 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.
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|--|----|--|
| 1.10 PROGRESS<br>MONITORING AND<br>REPORTING<br>(Cont'd) | .4 | Do not automatically update actual start and finish dates by using default mechanisms found in project management software.  |
|  | .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: <ul style="list-style-type: none"> <li>.1 Description of progress made.</li> <li>.2 Pending items and status of: shop drawings, change orders, possible time extensions,.</li> <li>.3 Status of Contract completion date and milestones.</li> <li>.4 Current and anticipated problem areas, potential delays and corrective measures.</li> <li>.5 Review of progress and status of Critical Path activities.</li> </ul> |

## PART 2 - PRODUCTS

- |                     |    |           |
|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not used. |
|---------------------|----|-----------|

## PART 3 - EXECUTION

- |                     |    |           |
|---------------------|----|-----------|
| <u>3.1 NOT USED</u> | .1 | Not used. |
|---------------------|----|-----------|

PART 1 - GENERAL

1.1 RELATED  
REQUIREMENTS

- .1 Section 01 31 19 - Project Meeting.
- .2 Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM)

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 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.
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## 1.2 DEFINITIONS (Cont'd)

- .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.

## 1.3 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 for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

## 1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit to Departmental Representative within 15 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.
-

- 1.5 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:
    - .1 Award.
    - .2 Shop Drawings, Samples.
    - .3 Permits.
    - .4 Mobilization.
    - .5 Excavation.
    - .6 Backfill.
    - .7 Building footings.
    - .8 Slab on grade.
    - .9 Structural Steel.
    - .10 Siding and Roofing.
    - .11 Interior Architecture (Walls, Floors and Ceiling).
    - .12 Plumbing.
    - .13 Lighting.
    - .14 Electrical.
    - .15 Piping.
    - .16 Controls.
    - .17 Heating, Ventilating, and Air Conditioning.
    - .18 Millwork.
    - .19 Fire Systems.
    - .20 Testing and Commissioning.
    - .21 Supplied equipment long delivery items.
    - .22 Engineer supplied equipment required dates.

- 1.7 PROJECT SCHEDULE REPORTING
- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
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<u>1.7 PROJECT SCHEDULE REPORTING (Cont'd)</u>	.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.
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<u>1.8 PROJECT MEETINGS</u>	.1	Discuss Project Schedule at regular site meetings, 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

<u>2.1 NOT USED</u>	.1	Not used.
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## PART 3 - EXECUTION

<u>3.1 NOT USED</u>	.1	Not used.
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PART 1 - GENERAL

1.1 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Work affected by submittal shall not proceed until review is complete.
- .3 Present shop drawings, product data, Commissioning documentation, 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 Departmental 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 shall be considered rejected.
- .6 Notify Departmental 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 coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

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| <u>1.1 ADMINISTRATIVE<br/>(Cont'd)</u> | .10 | Keep one reviewed copy of each submission on site. |
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|---|----|--|
| <u>1.2 SHOP DRAWINGS<br/>AND PRODUCT DATA</u> | .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 | 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 coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications. |
|   | .3 | Where technical sections specify that shop drawings bear the stamp of a Registered Professional Engineer, registered in the Province of Ontario.   |
|   | .4 | Allow 10 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 any revisions other than those requested.  |
|   | .7 | Accompany submissions with transmittal letter, in duplicate, containing:<br>.1 Date.<br>.2 Project title and number.<br>.3 Contractor's name and address.<br>.4 Identification and quantity of each shop drawing, product data and sample.<br>.5 Other pertinent data.   |
|   | .8 | Submissions shall include:   |
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1.2 SHOP DRAWINGS  
AND PRODUCT DATA  
(Cont'd)

- .8 (Cont'd)
  - .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.
    - .11 Equipment identification.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit 6 prints of shop drawings, product data, test reports, certificates, and manufacturers instructions for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Delete information not applicable to project.
- .12 Supplement standard information to provide details applicable to project.
- .13 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.

1.2 SHOP DRAWINGS  
AND PRODUCT DATA  
(Cont'd)

- .14 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept. This review shall not mean that PWGSC 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 all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.3 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Where colour, pattern or texture is criterion, submit full range of samples.
- .3 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.4 FEES, PERMITS  
AND CERTIFICATES

- .1 Provide authorities having jurisdiction with information requested.
- .2 Pay fees and obtain certificates and permits required.
- .3 Furnish certificates and permits.
- .4 Submit acceptable certificate stating that suspended ceiling systems provide adequate support for electrical fixtures, as required by current bulletin of Electrical Inspection Department of Ontario Hydro.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.



## PART 1 - GENERAL

- 1.1 Purpose .1 To ensure that both the construction project and the institutional operations may proceed without undue disruption or hindrance and that the security of the Institution is maintained at all times.
- 1.2 Definitions .1 "Contraband" means:
- .1 An intoxicant, including alcoholic beverages, drugs and narcotics.
  - .2 Tobacco or associated tobacco products.
  - .3 An igniting device, lighter or matches.
  - .4 A weapon or a component thereof, ammunition for a weapon, and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization.
  - .5 An explosive or a bomb or a component thereof.
  - .6 Currency over any applicable prescribed limit, \$25 when possessed by an inmate, visitor or contractor without prior authorization.
  - .7 Any item not described in paragraphs 1.2.1.1 to 1.2.1.6 that could jeopardize the security of a Penitentiary or the safety of persons, when that item is possessed without prior authorization.
- .2 "Unauthorized Smoking and related Items" means all smoking items including, but not limited to, cigarettes, cigars, tobacco, chewing tobacco, cigarette making machines, matches and lighters.
- .3 "Commercial Vehicle" means any motor vehicle used for the shipment of material, equipment and tools required for the construction project.
- .4 "CSC" means Correctional Service Canada.
- .5 "Director" means, Director, Warden or Superintendent of the Institution as applicable.
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| 1.2 Definitions<br>(Cont'd) | .6 | "Construction Employees" means persons working for the General Contractor, the sub-contractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.   |
|                             | .7 | "Departmental Representative" means the project manager from Public Works and Government Services Canada.  |
|                             | .8 | "Perimeter" means the fenced or walled area of the Institution that restrains the movement of the inmates.   |
|                             | .9 | "Construction Limits" means the area as shown on the contract drawings that the Contractor will be allowed to work. This area may or may not be isolated from the security area of the Institution.  |
| 1.3 Preliminary Proceedings | .1 | Prior to the commencement of work, the Contractor shall meet with the Director or his/her representative to: <ul style="list-style-type: none"> <li>.1 Discuss the nature and extent of all activities involved in the Project.</li> <li>.2 Establish mutually acceptable security procedures in accordance with this instruction and the institution's particular requirements.</li> </ul>                |
|                             | .2 | Contractor shall: <ul style="list-style-type: none"> <li>.1 Ensure that all Construction Employees are aware of the security requirements.</li> <li>.2 Ensure that a copy of the security requirements is always prominently on display at the job site.</li> <li>.3 Co-operate with institutional personnel in ensuring that security requirements are observed by all Construction Employees.</li> </ul> |
| 1.4 Construction Employees  | .1 | Submit to the Director a list of the names with date of birth of all Construction Employees to be employed on the construction site and a security clearance form for each employee.   |
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1.4 Construction  
Employees  
(Cont'd)

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- .2 Submit a copy of photo ID with CPIC clearance form for each employee. Allow two (2) weeks for processing of security clearances. Employees will not be admitted to the Institution without a valid security clearance in place and a recent picture identification such as a provincial driver's license. Security clearances obtained from other CSC Institutions are not valid at this Institution.
- .3 The Director may require that facial photographs may be taken of Construction Employees and these photographs may be displayed at appropriate locations in the Institution or in an electronic database for identification purposes. The Director may require that Photo ID cards be provided for all Construction Employees. ID cards will then be left at the designated entrance to be picked upon arrival at the institution and shall be displayed prominently on the Construction Employees' clothing at all time while Construction Employees are in the institution.
- .4 Entry to Institutional Property will be refused to any person there may be reason to believe may be a security risk.
- .5 Any person employed on the construction site will be subject to immediate removal from Institutional Property if they:
  - .1 Appear to be under the influence of alcohol, drugs or narcotics.
  - .2 Behave in an unusual or disorderly manner.
  - .3 Are in possession of contraband.
- .6 Smoking is prohibited anywhere on CSC property.

1.5 Vehicles

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- .1 All unattended vehicles on CSC property shall have windows closed; doors and trunks shall be locked and keys removed. The keys shall be securely in the possession of the owner or an employee of the company that owns the vehicle.
  - .2 Gas caps on all vehicles and motorized equipment shall be lockable.
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|---------------------------------|----|--|
| <u>1.5 Vehicles</u><br>(Cont'd) | .3 | The Director may limit at any time the number and type of vehicles allowed within the institution.   |
|                                 | .4 | Drivers of delivery vehicles for material required by the project will not require security clearances but must remain with their vehicle the entire time that the vehicle is in the Institution. The Director will require that these vehicles be escorted by Institutional Staff or Commissionaires while in the Institution.                              |
|                                 | .5 | If the Director permits trailers to be left inside the secure perimeter of the Institution, these trailer doors will be locked at all times. All windows will be securely locked when left unoccupied. All trailer windows shall be covered with expanded metal mesh. All storage trailers inside and outside the perimeter shall be locked when not in use. |
| <u>1.6 Parking</u>              | .1 | Parking area(s) to be used by Construction Employees will be designated by the Director. Parking in other location will be prohibited and vehicles may be subject to removal.  |
| <u>1.7 Shipments</u>            | .1 | All shipments of project material, equipment and tools shall be addressed in the Contractor's name to avoid confusion with the Institution's own shipments. The Contractor must have his/her own employees on site to receive any deliveries or shipments. CSC staff will NOT accept receipt of deliveries or shipments of any material, equipment or tools. |
| <u>1.8 Telephones</u>           | .1 | There will be no installation of telephones, Facsimile machines and computers with Internet connections permitted within the perimeter of the Institution unless prior approval of the Director is received.   |
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1.8 Telephones  
(Cont'd)

- .2 The Director will ensure that approved telephones, facsimile machine and computers with internet connections are located where they are not accessible to inmates. All computers will have an approved password protection that will stop an internet connection to unauthorized personnel.
- .3 Wireless cellular and digital telephones, including but not limited to devices for telephone messaging, pagers, Blackberries, telephone used as 2-way radios, are not permitted within the Institution unless approved by the Director. If wireless cellular telephones are permitted, the user will not permit their use by any inmate.
- .4 The Director may approve but limit the use of two way radios.

1.9 Work Hours

- .1 Work hours within the Institution are: Monday to Friday, 08:00 hrs to 16:00 hrs.
- .2 Work will not be permitted during weekends and statutory holidays without the permission of the Director. A minimum of seven (7) days advance notice will be required to obtain the required permission. In case of emergencies or other special circumstances, this advance notice may be waived by the Director.

1.10 Overtime Work

- .1 No overtime work will be allowed without permission of the Director. Give a minimum forty-eight (48) hours advance notice when overtime work on the construction project is necessary and approved. If overtime work is required because of an emergency such as work to make the construction safe and secure, the Contractor shall advise the Director as soon as this condition is known and follow the directions given by the Director. Costs to the Crown for such events may be attributed to the Contractor.
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1.10 Overtime Work (Cont'd)	.2	When overtime work, weekend, or statutory holiday work is required and approved by the Director, extra staff members may be posted by the director or his/her designate, to maintain the security surveillance. The Departmental Representative may post extra staff for inspection of construction activities. The actual cost of this extra staff may be subject to reclamation by the Crown.
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1.11 Tools and Equipment	.1	Maintain a complete list of all tools and equipment to be used during the construction project. Make this inventory available for inspection when required.
	.2	Throughout the construction project maintain up-to-date the list of tools and equipment specified above.
	.3	Keep all tools and equipment under constant supervision, particularly power-driven and cartridge-driven tools, cartridges, files, saw blades, rod saws, wire, rope, ladders and any sort of jacking device.
	.4	Store all tools and equipment in approved secure locations.
	.5	Lock all tool boxes when not in use. Keys to remain in the possession of the employees of the Contractor. Scaffolding shall be secured and locked when not erected and when erected, will be secured in a manner agreed upon with the Institutional designate.
	.6	All missing or lost tools or equipment shall be reported immediately to the Director.
	.7	The Director will ensure that the security staff members carry out checks of the Contractor's tools and equipment against the list provided by the Contractor. These checks may be carried out at the following intervals: <ul style="list-style-type: none"> <li>.1 At the beginning and conclusion of every construction project.</li> <li>.2 Weekly, when the construction project extends longer than a one week period.</li> <li>.3 The Contractor may be subject to random checks by security staff to ensure proper storage and security of tools throughout the project.</li> </ul>

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| <u>1.11 Tools and Equipment<br/>(Cont'd)</u> | .8  | Certain tools/equipment such as cartridges and hacksaw blades are highly controlled items. The Contractor will be given at the beginning of the day, a quantity that will permit on day's work. Used blades/cartridges will be returned to the Director's representative at the end of each day. |
|  | .9  | If propane or natural gas is used for heating the construction, the Institution will require that an employee of the Contractor supervise the construction site during non-working hours.  |
|  | .10 | If torches or grinders are required tools to perform Work, Contractor must complete a Hot Work Permit as supplied by CSC. Completed original form(s) are copied and posted on the work site in a conspicuous location. Original documents are to remain with the Institutional Fire Chief.       |
| <u>1.12 Prescription Drugs</u>               | .1  | Employees of the Contractor who are required to take prescription drugs during the workday shall obtain approval of the Director to bring a one day supply only into the Institution.  |
| <u>1.13 Smoking Restrictions</u>             | .1  | Contractors and construction employees are not permitted to smoke inside correctional facilities or outdoors within the perimeter of a correctional facility and must not possess unauthorized smoking items within the perimeter of a correctional facility.                                    |
|  | .2  | Contractors and construction employees who are in violation of this policy will be requested to immediately cease smoking or dispose of any unauthorized smoking items and, if they persist, will be directed to leave the institution.  |
|  | .3  | Smoking is only permitted outside the perimeter of a correctional facility in an area to be designated by the Director.  |
| <u>1.14 Contraband</u>                       | .1  | Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are prohibited on Institutional Property.  |
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- 1.14 Contraband (Cont'd)
- .2 Discovery of Contraband on the construction site and the identification of the person(s) responsible for the Contraband shall be reported immediately to the Director.
  - .3 Contractors shall be vigilant with both their staff and the staff of their sub-contractors and suppliers that the discovery of Contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the Institution for the duration of the construction.
  - .4 Presence of arms and ammunition in vehicles of Contractors, sub-contractors and suppliers or employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.
- 1.15 Searches
- .1 All vehicles and persons entering Institutional property may be subject to search.
  - .2 When the Director suspects, on reasonable grounds, that an employee of the Contractor is in possession of Contraband or unauthorized items, he/she may order that person to be searched.
  - .3 All employees entering the Institution may be subject to screening of personal effects for traces of Contraband drug residue.
- 1.16 Access to and Removal from Institution Property
- .1 Construction personnel and commercial vehicles will not be admitted to the Institution after normal working hours, unless approved by the Director.
- 1.17 Movement of Vehicles
- .1 Escorted commercial vehicles will be allowed to enter or leave the Institution after normal working hours, unless approved by the Director.
    - .1 08:00 hrs to 11:00 hrs.
    - .2 13:00 hrs to 16:00 hrs.
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1.17 Movement of  
Vehicles  
(Cont'd)

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- .2 Construction vehicles shall not leave the Institution until and inmate count is completed.
- .3 The Contractor shall advise the Director twenty four (24) hours in advance to the arrival on the site of heavy equipment such as concrete trucks, cranes, etc.
- .4 Vehicles being loaded with soil or other debris, or any vehicle considered impossible to search, must be under continuous supervision by CSC Staff or Commissionaires working under the authority of the Director.
- .5 Commercial Vehicles will only be allowed access to Institutional property when their contents are certified by the Contractor or his/her representative as being strictly necessary to the execution of the construction project.
- .6 Vehicles shall be refused access to Institutional property if, in the opinion of the Director, they contain any article which may jeopardize the security of the Institution.
- .7 Private vehicles of Construction Employees will not be allowed within the security wall or fence of medium or maximum security Institutions without the permission of the Director.
- .8 With prior approval of the Director, a vehicle may be used in the morning and evening to transport a group of employees to the work site. This vehicle will not remain within the institution the remainder of the day.
- .9 With the approval of the Director, certain equipment may be permitted to remain on the construction site overnight or over the weekend. This equipment must be securely locked, with the battery removed. The director may require that the equipment be secured with a chain and padlock to another solid object.

- 1.18 Movement of Construction Employees on Institutional Property
- .1 Subject to the requirements of good security, the Director will permit the contractor and his/her employees as much freedom of action and movement as is possible.
- .2 However, notwithstanding paragraph above, the Director may:
- .1 Prohibit or restrict access to any part of the Institution.
- .2 Require that in certain areas of the Institution, either during the entire construction project or at certain intervals, Construction Employees only be allowed access when accompanied by a member of the CSC security staff.
- .3 During the lunch and coffee/health breaks, all employees will remain within the construction site. Employees are not permitted to eat in the officer's lounge and dining room.
- 1.19 Surveillance and Inspection
- .1 Construction activities and all related movement of personnel and vehicles will be subject to surveillance and inspection by CSC security staff members to ensure that established security requirements are met.
- .2 CSC staff members will ensure that an understanding of the need to carry out surveillance and inspections, as specified above, is established among Construction Employees and maintained throughout the construction project.
- 1.20 Stoppage of Work
- .1 The Director may request at any time that the Contractor, his/her employees, sub-contractors and their employees not enter or leave the work site immediately due to a security situation occurring within the Institution. The Contractor's site supervisor shall note the name of the staff member making the request and the time of the request and obey the order as quickly as possible.
- .2 The Contractor shall advise the Departmental Representative within 24 hours of this delay to the progress of the work.
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<u>1.21 Contact with Inmates</u>	.1	Unless specifically authorized, it is forbidden to come into contact with inmates, to talk to them, to receive objects from them or to give them objects. Any employee doing any of the above will be removed from the site and his/her security clearance revoked.
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<u>1.22 Completion of Construction project</u>	.1	Upon completion of the construction project, when applicable, the takeover of facility, the Contractor shall remove all remaining construction material, tools and equipment that are not specified to remain in the Institution as part of the construction contract.
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## PART 2 - PRODUCTS

<u>2.1 Not Used</u>	.1	Not used.
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## PART 3 - EXECUTION

<u>3.1 Not Used</u>	.1	Not used.
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## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 National Fire Code 2005 (NFC):
  - .1 NFC 2005, Division B, Part 2 Emergency Planning, subsection 2.8.2 Fire Safety Plan.
- .2 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 Workplace Safety and Insurance Act, 1997.
  - .3 Municipal statutes and authorities.
- .3 Fire Commissioner of Canada (FCC):
  - .1 FC-301 Standard for Construction Operations.
  - .2 FC-302 Standard for Welding and Cutting, June 1982.

Labour Program  
Fire Protection Engineering Services  
4900 Yonge Street 8th Floor  
Willowdale, Ontario M2N 6A8

and copies may be obtained from:

Human Resources and Social Development Canada  
Labour Program  
Fire Protection Engineering Services  
Ottawa, Ontario K1A 0J2

### 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.

1.2 SUBMITTALS  
(Cont'd)

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- .2 (Cont'd)
    - .3 Provide a Fire Safety Plan, specific to the work location, in accordance with NBC, prior to commencement of work. The plan shall be coordinated with, and integrated into, the existing Building, Facility, Emergency Procedures and Evacuation Plan in place at the site. Departmental representative will provide Building, Facility, 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.
    - .4 Contractor's and Sub-contractors' Safety Communication Plan.
    - .5 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, Facility, 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 records of Contractor's Health and Safety meetings when requested.
  - .6 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly.
  - .7 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
  - .8 Submit copies of incident and accident reports.
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| <u>1.2 SUBMITTALS<br/>(Cont'd)</u>     | .9 | Submit Material Safety Data Sheets(MSDS)in accordance with Section 01 33 00.   |
| <u>1.3 FILING OF<br/>NOTICE</u>        | .1 | File Notice of Project with Provincial authorities prior to commencement of Work.  |
| <u>1.4 WORK PERMIT</u>                 | .1 | Obtain building permit related to project prior to commencement of Work.   |
|  | .2 | Obtain Hot Work Permit from Chief Plant Maintenance.   |
| <u>1.5 SAFETY<br/>ASSESSMENT</u>       | .1 | Perform site specific safety hazard assessment related to project.   |
| <u>1.6 MEETINGS</u>                    | .1 | Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.  |
| <u>1.7 REGULATORY<br/>REQUIREMENTS</u> | .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.   |
| <u>1.9 GENERAL<br/>REQUIREMENTS</u>    | .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.  |
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1.9 GENERAL  
REQUIREMENTS  
(Cont'd)

- .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 UNFORESEEN  
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 Act for the Province of Ontario.

1.13 POSTING OF  
DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Ontario, and in consultation with Departmental Representative.
- .1 Contractor's Safety Policy.
- .2 Constructor's Name.

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|---|----|--|
| <u>1.13 POSTING OF<br/>DOCUMENTS<br/>(Cont'd)</u> | .1 | (Cont'd)<br>.3 Notice of Project.<br>.4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).<br>.5 Ministry of Labour Orders and reports.<br>.6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.<br>.7 Address and phone number of nearest Ministry of Labour office.<br>.8 Material Safety Data Sheets.<br>.9 Written emergency Response Plan.<br>.10 Site Specific Safety Plan.<br>.11 Valid certificate of first aider on<br>.12 WSIB "In Case of Injury At Work" poster.<br>.13 Location of toilet and cleanup facilities. |
| <u>1.14 CORRECTION OF<br/>NON-COMPLIANCE</u>      | .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.   |
| <u>1.15 WORK STOPPAGE</u>                         | .1 | Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.  |

## PART 2 - PRODUCTS

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|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not used. |
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PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

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|-------------------------------|----|--|
| <u>1.1 FIRES</u>              | .1 | Fires and burning of rubbish on site not permitted.  |
| <u>1.2 DISPOSAL OF WASTES</u> | .1 | Do not bury rubbish and waste materials on site.   |
|                               | .2 | Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.   |
|                               | .3 | Dispose of waste in accordance with Section 01 74 20.  |
| <u>1.3 POLLUTION CONTROL</u>  | .1 | Maintain pollution control features installed under this contract.   |
|                               | .2 | Control emissions from equipment and plant to local authorities emission requirements.   |
|                               | .3 | Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.  |
|                               | .4 | Spills of deleterious substances:<br>.1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.<br>.2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060.<br>.3 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect. |

PART 2 - PRODUCTS

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|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.



## PART 1 - GENERAL

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|---|--|
| <u>1.1 RELATED.1<br/>SECTIONS</u>           | Building Code of Canada (NBC) including amendments and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.   |
|   | .2 Meet or exceed requirements of:<br>.1 Contract documents.<br>.2 Specified standards, codes and referenced documents.  |
| <u>1.2 DESIGNATED<br/>SUBSTANCES</u>        | .1 Designated substances have been identified as being present in this building. Refer to Designated Substance Report for Warkworth Institution, Campbellford, Ontario, Dated March 30, 2005. The contractor is required to comply with applicable legislation for any work causing disturbance to designated materials. |
| <u>1.3 BUILDING<br/>SMOKING ENVIRONMENT</u> | .1 Comply with smoking restrictions and municipal by-laws.   |

## PART 2 - PRODUCTS

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|---------------------|--------------|
| <u>2.1 NOT USED</u> | .1 Not Used. |
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## PART 3 - EXECUTION

- |                     |              |
|---------------------|--------------|
| <u>3.1 NOT USED</u> | .1 Not Used. |
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PART 1 - GENERAL

1.1 RELATED  
SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 78 00 - Closeout Submittals.

1.2 INSPECTION

- .1 Allow Departmental Representative 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 Departmental Representative 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 Departmental Representative may order any 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. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.3 INDEPENDENT  
INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.

1.3 INDEPENDENT  
INSPECTION AGENCIES  
(Cont'd)

- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.4 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.7 EQUIPMENT AND  
SYSTEMS

- .1 Submit testing, adjusting and balancing reports for mechanical, electrical and building equipment systems.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.



PART 1 - GENERAL

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|--|----|---|
| <u>1.1 RELATED SECTIONS</u>                  | .1 | Section 01 52 00 - Construction Facilities.   |
|  | .2 | Section 01 56 00 - Temporary Barriers and Enclosures.   |
| <u>1.2 INSTALLATION AND REMOVAL</u>          | .1 | Provide temporary utilities controls in order to execute work expeditiously.  |
|  | .2 | Remove from site all such work after use.   |
| <u>1.3 WATER SUPPLY</u>                      | .1 | Departmental Representative will provide continuous supply of potable water for construction use.   |
|  | .2 | Departmental Representative will pay for utility charges at prevailing rates.   |
| <u>1.4 TEMPORARY HEATING AND VENTILATION</u> | .1 | Provide temporary heating required during construction period, including attendance, maintenance and fuel.  |
|  | .2 | Provide temporary heat and ventilation in enclosed areas as required to:<br>.1 Facilitate progress of Work.<br>.2 Protect Work and products against dampness and cold.<br>.3 Prevent moisture condensation on surfaces.<br>.4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.<br>.5 Provide adequate ventilation to meet health regulations for safe working environment. |
|  | .3 | Ventilating:<br>.1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.<br>.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.  |
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1.4 TEMPORARY  
HEATING AND  
VENTILATION  
(Cont'd)

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- .3 (Cont'd)
  - .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.
- .4 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  - .1 Conform with applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes.
  - .5 Vent direct-fired combustion units to outside.
- .5 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.5 TEMPORARY POWER  
AND LIGHT

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- .1 Departmental Representative will provide and pay for temporary power during construction for temporary lighting and operating of power tools.
- .2 Pay all costs for installation, maintenance and removal.
- .3 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
- .4 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.



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| <u>1.6 FIRE<br/>PROTECTION</u> | .1 | Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws. |
|                                | .2 | Burning rubbish and construction waste materials is not permitted on site.   |

PART 2 - PRODUCTS

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|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|



PART 1 - GENERAL

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|--|----|---|
| <u>1.1 SUBMITTALS</u>                            | .1 | Provide submittals in accordance with Section 01 33 00.   |
| <u>1.2 SITE STORAGE/LOADING</u>                  | .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.  |
| <u>1.3 TEMPORARY FENCING AND HORDING</u>         | .1 | Where specified or approved, temporary fencing and hording must be in good condition, with all welds and joints intact, and securely assembled and installed, to the satisfaction of the Departmental Representative. |
| <u>1.4 CONSTRUCTION PARKING</u>                  | .1 | Parking will be permitted on site only as indicated on drawings.  |
|  | .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.   |
| <u>1.5 EQUIPMENT, TOOL AND MATERIALS STORAGE</u> | .1 | Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.  |
|  | .2 | Provide a clearly marked and fully stocked first-aid case in a readily available location.  |
| <u>1.6 SANITARY FACILITIES</u>                   | .1 | Provide sanitary facilities for work force in accordance with governing regulations and ordinances.   |
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<u>1.6 SANITARY FACILITIES (Cont'd)</u>	.2	Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
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<u>1.7 PROTECTION AND MAINTENANCE OF TRAFFIC</u>	.1	Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
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<u>1.8 CLEAN-UP</u>	.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

<u>2.1 NOT USED</u>	.1	Not Used.
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PART 1 - GENERAL

<u>1.1 RELATED SECTIONS</u>	.1	Section 01 51 00 - Temporary Utilities.
	.2	Section 01 52 00 - Construction Facilities.
<u>1.2 REFERENCES</u>	.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.
<u>1.3 INSTALLATION AND REMOVAL</u>	.1	Provide temporary controls in order to execute Work expeditiously.
	.2	Provide temporary barriers, fences, and gates as specified in drawings, to quality specified. Use institutional grade locking hardware as directed in drawings.
	.3	Remove from site all such work after use.
<u>1.4 ACCESS TO SITE</u>	.1	Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
<u>1.5 FIRE ROUTES</u>	.1	Maintain access to property including overhead clearances for use by emergency response vehicles.
<u>1.6 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY</u>	.1	Protect surrounding private and public property from damage during performance of Work.
	.2	Be responsible for damage incurred.
<u>1.7 PROTECTION OF BUILDING FINISHES</u>	.1	Provide protection for finished and partially finished building finishes and equipment during performance of Work.

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|---|----|--|
| <u>1.7 PROTECTION OF<br/>BUILDING FINISHES<br/>(Cont'd)</u> | .2 | Provide necessary screens, covers, and<br>hoardings.   |
|   | .3 | Confirm with Departmental Representative<br>locations and installation schedule 3 days<br>prior to installation. |
|   | .4 | Be responsible for damage incurred due to lack<br>of or improper protection.                                     |

PART 2 - PRODUCTS

- |                     |    |           |
|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

PART 3 - EXECUTION

- |                     |    |           |
|---------------------|----|-----------|
| <u>3.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

## PART 1 - GENERAL

<u>1.1 RELATED SECTIONS</u>	.1	Section 01 45 00 - Quality Control.
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<u>1.2 REFERENCES</u>	.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.

<u>1.3 QUALITY</u>	.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.

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1.3 QUALITY  
(Cont'd)

- .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.

1.4 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 Price or Contract Time.

1.5 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.



<u>1.5 STORAGE, HANDLING AND PROTECTION (Cont'd)</u>	.6	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.
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	.7	Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
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	.8	Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.
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<u>1.6 TRANSPORTATION</u>	.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.

<u>1.7 MANUFACTURER'S INSTRUCTIONS</u>	.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 Price or Contract Time.

<u>1.8 QUALITY OF WORK</u>	.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.
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|--|----|---|
| <u>1.8 QUALITY OF WORK</u><br>(Cont'd) | .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.                           |
| <br>                                   |    |   |
| <u>1.9 CO-ORDINATION</u>               | .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.   |
| <br>                                   |    |   |
| <u>1.10 CONCEALMENT</u>                | .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.                                       |
| <br>                                   |    |   |
| <u>1.11 REMEDIAL WORK</u>              | .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.                           |
| <br>                                   |    |   |
| <u>1.12 LOCATION OF FIXTURES</u>       | .1 | Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.   |
|  | .2 | Inform Departmental Representative of conflicting installation. Install as directed.  |
-

#### 1.13 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.

#### 1.14 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.

#### 1.15 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.
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|--------------------------------|----|--|
| <u>1.16 EXISTING UTILITIES</u> | .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. |
|                                | .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.   |

PART 2 - PRODUCTS

- |                     |    |           |
|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

PART 3 - EXECUTION

- |                     |    |           |
|---------------------|----|-----------|
| <u>3.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

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.

1.3 PREPARATION  
(Cont'd)

- .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.
- .5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .9 Restore work with new products in accordance with requirements of Contract Documents.
- .10 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .11 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

<u>1.5 WASTE MANAGEMENT AND DISPOSAL</u>	.1	Separate waste materials for reuse and recycling in accordance with Section 01 74 20.
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PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not Used.
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PART 3 - EXECUTION

<u>3.1 NOT USED</u>	.1	Not Used.
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PART 1 - GENERAL

1.1 PROJECT  
CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .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.
- .7 Dispose of waste materials and debris off site.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 FINAL CLEANING

- .1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
-

1.2 FINAL CLEANING  
(Cont'd)

- .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.
- .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 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

## PART 1 - GENERAL

### 1.1 REGULATORY AGENCIES

- .1 The Ontario Ministry of Environment (OME) in accordance with Section 7 of Ontario Regulation 103/94 requires a source separation program for the waste that will be generated in the construction or demolition of a structure.
- .2 The source separation program required shall:
  - .1 Deal separately with each of the categories of waste set out in Part III of the Schedule that have been source separated from other kinds of waste and also from each other category of waste in Part III; or
  - .2 Provide for removal from the building site of any commingled categories of waste set out in Part III of the Schedule and for the immediate separation of such waste from all other kinds of waste and also from each category of waste in Part III, at
    - .1 permanent premises of the person undertaking the construction project
    - .2 permanent premises of the person on whose behalf the construction project is undertaken or
    - .3 a waste disposal site operating under the authority of a certificate of approval
- .3 The source separation program shall be implemented before construction work begins on site.

### 1.2 SUBMITTAL

- .1 Prepare and submit a waste reduction work plan. Describe management of construction wastes. Identify materials which can be recycled, reused and indicate methods proposed for reducing, reusing and recycling wastes.

### 1.3 WASTE COLLECTION AND DISPOSAL

- .1 Separate and salvage materials suitable for reuse and/or recycling from general waste stream.
- .2 Provide on site facilities for collection, handling and storage of anticipated quantities of reusable and/or recyclable materials.

1.3 WASTE  
COLLECTION AND  
DISPOSAL  
(Cont'd)

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- .3 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
- .4 Collect, handle, store on site and transport off site, salvaged materials, salvaged for reuse and/or recycling in separate condition. Transport to authorized reuse/recycling location.
- .5 Separate non salvageable materials from salvaged items. Transport and deliver non salvageable items to licensed disposal facility.
- .6 Burying, burning, selling waste materials on site is prohibited.
- .7 Disposals of liquid wastes into waterways, sewers is prohibited.
- .8 Unless specified otherwise, materials for removal become Contractor's property.
- .9 Clean up work, storage and waste collection areas as work progresses.

PART 1 - GENERAL

1.1 RELATED  
SECTIONS

- .1 Section 01 78 00 - Closeout Submittals.
- .2 Section 01 91 00 - Commissioning - General Requirements.

1.2 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 shall correct Work accordingly.
- .3 Completion: submit written certificate that the 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 and the performance of the equipment and system has been verified.
  - .4 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 reinspection.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 RELATED  
SECTIONS

- .1 Section 01 91 00 - Commissioning - General Requirements.

1.2 SUBMISSION

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .2 Copy will be returned 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.

1.3 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.

1.3 FORMAT  
(Cont'd)

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- .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.

1.4 CONTENTS - EACH  
VOLUME

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- .1 Table of Contents: provide title of project;
    - .1 date of submission; names,
    - .2 addresses, and telephone numbers of Consultant and 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 91 00.
-



1.5 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.
  - .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.
- .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".

1.6 RECORDING  
ACTUAL SITE  
CONDITIONS

- .1 Record information on set of black line opaque drawings, provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

1.6 RECORDING  
ACTUAL SITE  
CONDITIONS  
(Cont'd)

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- .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.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.7 EQUIPMENT AND  
SYSTEMS

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- .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.
-

1.7 EQUIPMENT AND  
SYSTEMS  
(Cont'd)

- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 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 and balancing reports as specified in Section 01 45 00 and 01 91 00.
- .15 Additional requirements: As specified in individual specification sections.

1.8 MATERIALS AND  
FINISHES

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

1.8 MATERIALS AND  
FINISHES  
(Cont'd)

- .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.

1.9 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 location as directed; 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.

1.10 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 location as directed; 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.

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|--|----|--|
| <u>1.11 SPECIAL TOOLS</u>                    | .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 location as directed; place and store.  |
|  | .4 | Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.                                 |
| <br>   |    |  |
| <u>1.12 STORAGE, HANDLING AND PROTECTION</u> | .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.   |
| <br>   |    |  |
| <u>1.13 WARRANTIES AND BONDS</u>             | .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.   |
-

1.13 WARRANTIES AND BONDS	.6	Co-execute submittals when required.
<u>(Cont'd)</u>	.7	Retain warranties and bonds until time specified for submittal.

PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not Used.
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PART 3 - EXECUTION

<u>3.1 NOT USED</u>	.1	Not Used.
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PART 1 - GENERAL

1.1 RELATED  
SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 - Quality Control.
- .3 Section 01 78 00 - Closeout Submittals.

1.2 QUALITY  
ASSURANCE

- .1 Co-operate with testing organization services under provisions specified in Section 01 45 00.
- .2 Testing organization certified to perform specified services.
- .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.

1.3 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 compliance with quality assurance provision.
  - .3 Submit 3 preliminary specimen copies of each report forms proposed for use.
  - .4 Submit completed report forms within 3 days after completion of each testing to Departmental Representative for review and verification.
  - .5 Fifteen days prior to Substantial Performance, submit 3 copies of final reports on applicable forms for functional performance verification.
-

1.4 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.

1.5 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.

1.6 EXECUTION

- .1 Test equipment.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.



PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.



## PART 1 - GENERAL

- |  |    |   |
|--|----|---|
| <u>1.1 REFERENCES</u>                    | .1 | Canadian Standards Association (CSA International)<br>.1 CSA S350-M1980(R1998), Code of Practice for Safety in Demolition of Structures.  |
| <u>1.2 WASTE MANAGEMENT AND DISPOSAL</u> | .1 | Separate waste materials for reuse and recycling in accordance with Section 01 74 20.   |
| <u>1.3 SITE CONDITIONS</u>               | .1 | Should material resembling spray or trowel-applied asbestos or other designated substance be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.<br>.1 Do not proceed until written instructions have been received from Departmental Representative. |
|  | .2 | Notify Departmental Representative before disrupting building access or services.   |

## PART 2 - PRODUCTS

- |                     |    |           |
|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not used. |
|---------------------|----|-----------|

## PART 3 - EXECUTION

- |                        |    |  |
|------------------------|----|--|
| <u>3.1 PREPARATION</u> | .1 | Inspect areas of work with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain. |
|                        | .2 | Locate and protect utilities. Preserve active utilities traversing site in operating condition.  |
|                        | .3 | Notify and obtain approval of utility companies before starting demolition.  |
-

### 3.2 PROTECTION

- .1 Keep noise, dust, and inconvenience to occupants to minimum.
- .2 Protect building systems, services and equipment.
- .3 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .4 Do Work in accordance with Section 01 35 29.

### 3.3 DEMOLITION

- .1 Remove parts of existing building and items to permit new construction.
- .2 Trim edges of partially demolished buildings or items elements to tolerances as defined by Departmental Representative to suit future use.
- .3 When removing or demolishing any installed item, remove all attachments, anchors, connections, and accessories unless directed otherwise.

### 3.4 DISPOSAL

- .1 Dispose of removed materials, to appropriate recycling facilities except where specified otherwise, in accordance with authority having jurisdiction.

## PART 1 - GENERAL

<u>1.1 Related Sections</u>	.1	Section 31 23 33.01 - Excavating, Trenching, and Backfilling.
<u>1.2 References</u>	.1	American Society for Testing and Materials International (ASTM)
	.1	ASTM C 260-06, Standard Specification for Air-Entraining Admixtures for Concrete.
	.2	ASTM C 309-07, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
	.3	ASTM C 330-05, Standard Specification for Lightweight Aggregates for Structural Concrete.
	.4	ASTM C 494/C494M-08, Standard Specification for Chemical Admixtures for Concrete.
	.5	ASTM C 1017/C1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
	.6	ASTM D 412-06, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
	.7	ASTM D 624-00(2007), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
	.8	ASTM D 1751-04, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
	.9	ASTM D 1752-04a, Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
	.2	Canadian General Standards Board (CGSB)
	.1	CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
	.2	CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
	.3	Canadian Standards Association (CSA International)
	.1	CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

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1.2 References  
(Cont'd)

- .3 (Cont'd)
- .2 CSA A283-06, Qualification Code for Concrete Testing Laboratories.
- .3 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .1 CSA-A3001-08, Cementitious Materials for Use in Concrete.

1.3 Acronyms and  
Types

- .1 Cement: hydraulic cement or blended hydraulic cement (XXb - where b denotes blended).
  - .1 Type GU or GUb - General use cement.
  - .2 Type MS or MSb - Moderate sulphate-resistant cement.
  - .3 Type MH or MHb - Moderate heat of hydration cement.
  - .4 Type HE or Heb - High early-strength cement.
  - .5 Type LH or LHb - Low heat of hydration cement.
  - .6 Type HS or HSb - High sulphate-resistant cement.
- .2 Fly ash:
  - .1 Type F - with CaO content less than 8%.
  - .2 Type CI - with CaO content ranging from 8 to 20%.
  - .3 Type CH - with CaO greater than 20%.
- .3 GGBFS - Ground, granulated blast-furnace slag.

1.4 Design  
Requirements

- .1 Alternative 1 - Performance: in accordance with CSA-A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

1.5 Submittals

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29 - Health and Safety Requirements.
- .3 Concrete pours: submit accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken.

1.5 Submittals  
(Cont'd)

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- .4 Concrete hauling time: submit for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.6 Quality  
Assurance

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- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
  - .2 Site Meetings: Convene pre-installation meeting one week prior to beginning concrete works.
    - .1 Ensure key personnel attend.
    - .2 Verify project requirements.
  - .3 Submit to Departmental Representative minimum 4 weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.
    - .1 When plant does not hold valid certification, provide test data and certification by qualified independent inspection and testing laboratory that materials used in concrete mixture will meet specified requirements.
  - .4 Minimum 4 weeks prior to starting concrete work, submit proposed quality control procedures for review by Departmental Representative on following items:
    - .1 Falsework erection.
    - .2 Hot weather concrete.
    - .3 Cold weather concrete.
    - .4 Curing.
    - .5 Finishes.
    - .6 Formwork removal.
    - .7 Joints.
  - .5 Quality Control Plan: submit written report, as described in PART 3 - VERIFICATION, to Departmental Representative verifying that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.
  - .6 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29 Health and Safety Requirements.
-

1.7 Delivery,  
Storage and  
Handling

- .1 Concrete hauling time: maximum allowable time for concrete to be delivered to site of Work and discharged not to exceed 120 minutes after batching.
  - .1 Modifications to maximum time limit must be agreed to by Departmental Representative laboratory representative and concrete producer as described in CSA A23.1/A23.2.
  - .2 Deviations to be submitted for review by Departmental Representative.
- .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
- .3 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.
  - .2 Divert unused concrete materials from landfill to local facility approved by. Departmental Representative
  - .3 Provide an appropriate area on the job site where concrete trucks can be safely washed.
  - .4 Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by the Departmental Representative.
  - .5 Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
  - .6 Prevent admixtures and additive materials from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with inert, noncombustible material and remove for disposal. Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

PART 2 - PRODUCTS

2.1 Materials

- .1 Cement: to CAN/CSA-A3001, Type GU.
- .2 Blended hydraulic cement: Type GUb GU to CAN/CSA-A3001.



## 2.1 Materials

(Cont'd)

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- .3 Supplementary cementing materials: to CAN/CSA-A3001.
- .4 Water: to CSA-A23.1.
- .5 Aggregates: to CAN/CSA-A23.1/A23.2.
- .6 Admixtures:
  - .1 Air entraining admixture: to ASTM C 260.
  - .2 Chemical admixture: to ASTM C 494 and ASTM C 1017. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .7 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA-A23.1/A23.2.
  - .1 Compressive strength: 50 MPa at 28 days.
  - .2 Net shrinkage at 28 days: maximum 0%.
- .8 Premoulded joint fillers:
  - .1 Bituminous impregnated fiber board: to ASTM D 1751.
  - .2 Sponge rubber: to ASTM D 1752, Type I, firm grade.
- .9 Curing Compound: to CSA-A23.1/A23.2, white.
- .10 Polyethylene film: to CAN/CGSB-51.34.

## 2.2 Mixes

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- .1 Alternative 1 - Performance Method for specifying concrete: to meet Departmental Representative performance criteria in accordance with CAN/CSA-A23.1/A23.2.
  - .1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in PART 3 - VERIFICATION.
  - .2 Provide concrete mix to meet following requirements:
  - .3 Footings, Foundation Walls and Retaining Walls:
    - .1 Compressive Strength 28-day: 30MPa
    - .2 Class of Exposure: F-2
    - .3 Nominal Size Coarse Aggregate: 20mm
    - .4 Air Content (%): 4-7
    - .5 Maximum W/C Ratio: 0.55
    - .6 Min. Cementing Materials(kg/m3):N/A
    - .7 Curing Type (per Table 20 of A23.1): "Basic"

- 2.2 Mixes  
(Cont'd)
- 
- .1 (Cont'd)
- .4 Sidewalks, Curbs:
- .1 Compressive Strength 28day: 32 MPa
  - .2 Class of Exposure: C-2
  - .3 Nominal Size Coarse Aggregate: 20mm
  - .4 Air Content (%): 5-8
  - .5 Maximum W/C Ratio: 0.45
  - .6 Min. Cementing Materials(kg/m3):N/A
  - .7 Curing Type (per Table 20 of A23.1):  
"Additional"

### PART 3 - EXECUTION

- 3.1 Preparation
- 
- .1 Obtain Departmental Representative's approval before placing concrete.
- .1 Provide 24 hours notice prior to placing of concrete.
- .2 During concreting operations:
- .1 Development of cold joints not allowed.
  - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .3 Pumping of concrete is permitted only after approval of equipment and mix.
- .4 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .5 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing.
- .6 Protect previous Work from staining.
- .7 Clean and remove stains prior to application for concrete finishes.
- .8 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .9 Do not place load upon new concrete until authorized by Departmental Representative.
-

3.2 Construction

- .1 Do cast-in-place concrete work in accordance with CSA-A23.1/A23.2.
- .2 Sleeves and inserts:
  - .1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through bored piles, grade beams, walls, piers or footings, except where indicated or approved by Departmental Representative.
  - .2 Where approved by Departmental Representative, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.
  - .3 Sleeves and openings greater than 100 x 100 mm not indicated, must be reviewed by Departmental Representative.
  - .4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Departmental Representative before placing of concrete.
  - .5 Check locations and sizes of sleeves and openings shown on drawings.
  - .6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
- .3 Anchor bolts:
  - .1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.
  - .2 With approval of Departmental Representative, grout anchor bolts in preformed holes or holes drilled after concrete has set. Formed holes to be minimum 100 mm diameter. Drilled holes to be to manufacturers' recommendations.
  - .3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.
  - .4 Set bolts and fill holes with epoxy grout.
- .4 Drainage holes and weep holes:
  - .1 Form weep holes and drainage holes in accordance with Section 03 10 00 - Concrete Forming and Accessories. If wood forms are used, remove them after concrete has set.
  - .2 Install weep hole tubes and drains as indicated.
- .5 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.

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- |                              |    |  |
|------------------------------|----|--|
| 3.2 Construction<br>(Cont'd) | .6 | Finishing and curing:<br>.1 Use procedures as reviewed by Departmental Representative or those noted in CSA-A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.<br>.2 Finish concrete floor to meet requirements of CSA-A23.1/A23.2. Class C - Industrial Floor. Wet cure all interior slabs without the use of any applied curing compound.<br>.3 Concrete floor to have finish hardness equal or greater than Mohs hardness in accordance with CSA-A23.1/A23.2.<br>.4 Provide screed float swirl-trowelled finish unless otherwise indicated.<br>.5 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated. |
|                              | .7 | Isolation joints:<br>.1 Furnish filler for each joint in single piece for depth and width required for joint.<br>.2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.<br>.3 Locate and form isolation and construction joints as indicated.<br>.4 Install joint filler.<br>.5 Use 9 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to finished slab surface unless indicated otherwise.  |
|                              | .8 | Sawcut Control Joints:<br>.1 Apply two component epoxy joint sealant to sawcut control joints in accordance with manufacturer's instructions.  |
| 3.3 Surface<br>Tolerance     | .1 | Concrete tolerance in accordance with CSA-A23.1/A23.2 Table 22, Class C: Industrial Floor.   |
| 3.4 Field Quality<br>Control | .1 | Site tests: conduct following test in accordance with Section 01 45 00 - Quality Control and submit reports.<br>.1 Concrete pours.<br>.2 Slump tests.  |
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3.4 Field Quality Control  
(Cont'd)

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- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review in accordance with CSA-A23.1/A23.2.
  - .1 Ensure testing laboratory is certified in accordance with CSA A283.
- .3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Departmental Representative.
- .4 Departmental Representative will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.
- .5 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .6 Non-Destructive Methods for Testing Concrete: in accordance with CSA-A23.1/A23.2.
- .7 Inspection or testing by Departmental Representative will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.5 Verification

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established in PART 2 - Products and provide verification of compliance as described in PART 1 - Quality Assurance.



## PART 1 - GENERAL

<u>1.1 REFERENCES</u>	.1	American Society for Testing and Materials International, (ASTM) .1 ASTM A53/A53M-06, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
	.2	Canadian General Standards Board (CGSB) .1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer. .2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.
	.3	Canadian Standards Association (CSA International) .1 CAN/CSA-G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel. .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles. .3 CSA W59-03, Welded Steel Construction (Metal Arc Welding) (Imperial Version).
<u>1.2 SUBMITTALS</u>	.1	Shop Drawings .1 Submit shop drawings in accordance with Section 01 33 00. .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
<u>1.3 QUALITY ASSURANCE</u>	.1	Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
<u>1.4 DELIVERY, STORAGE, AND HANDLING</u>	.1	Packing, Shipping, Handling and Unloading: .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00.
<u>1.5 WASTE MANAGEMENT AND DISPOSAL</u>	.1	Separate and recycle waste materials in accordance with Section 01 74 20.

- |   |    |  |
|---|----|--|
| <u>1.5 WASTE<br/>MANAGEMENT AND<br/>DISPOSAL<br/>(Cont'd)</u> | .2 | Remove from site and dispose of packaging materials at appropriate recycling facilities.                         |
|   | .3 | Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative. |

PART 2 - PRODUCTS

- |                      |    |  |
|----------------------|----|--|
| <u>2.1 MATERIALS</u> | .1 | Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W. |
|                      | .2 | Steel pipe: to ASTM A53/A53M standard weight, black finish.      |
|                      | .3 | Welding materials: to CSA W59.                                   |
|                      | .4 | Welding electrodes: to CSA W48 Series.                           |
|                      | .5 | Bolts and anchor bolts: to ASTM A307.                            |
|                      | .6 | Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.   |

- |                        |    |   |
|------------------------|----|---|
| <u>2.2 FABRICATION</u> | .1 | Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured. |
|                        | .2 | Where possible, fit and shop assemble work, ready for erection.   |
|                        | .3 | Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.           |

- |                     |    |                                     |
|---------------------|----|-------------------------------------|
| <u>2.3 FINISHES</u> | .1 | Shop coat primer: to CAN/CGSB-1.40. |
|---------------------|----|-------------------------------------|

- |                          |    |   |
|--------------------------|----|---|
| <u>2.4 SHOP PAINTING</u> | .1 | Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.   |
|                          | .2 | Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C. |



2.4 SHOP PAINTING      .3      Clean surfaces to be field welded; do not  
(Cont'd)

PART 3 - EXECUTION

3.1 ERECTION      .1      Do welding work in accordance with CSA W59  
unless specified otherwise.

                         .2      Erect metalwork square, plumb, straight, and  
true, accurately fitted, with tight joints and  
intersections.

                         .3      Provide suitable means of anchorage acceptable  
to Departmental Representative such as dowels,  
anchor clips, bar anchors, expansion bolts and  
shields, and toggles.

                         .4      Exposed fastening devices to match finish and  
be compatible with material through which they  
pass.

                         .5      Provide components for building by other  
sections in accordance with shop drawings and  
schedule.

                         .6      Make field connections with bolts to  
CAN/CSA-S16.1, or weld.

                         .7      Hand items over for casting into concrete or  
building into masonry to appropriate trades  
together with setting templates.

                         .8      Touch-up rivets, field welds, bolts and burnt  
or scratched surfaces after completion of  
erection with primer.

                         .9      Touch-up galvanized surfaces with zinc rich  
primer where burned by field welding.

3.2 CLEANING      .1      Perform cleaning after installation to remove  
construction and accumulated environmental  
dirt.

                         .2      Upon completion of installation, remove  
surplus materials, rubbish, tools and  
equipment barriers.



## PART 1 - GENERAL

- |                        |    |   |
|------------------------|----|---|
| <u>1.1 REFERENCES</u>  | .1 | Health Canada/Workplace Hazardous Materials Information System (WHMIS)<br>.1 Material Safety Data Sheets (MSDS).  |
|                        | .2 | Underwriter's Laboratories of Canada (ULC)<br>.1 ULC-S115-05, Fire Tests of Firestop Systems.   |
| <u>1.2 DEFINITIONS</u> | .1 | Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.  |
|                        | .2 | Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.   |
|                        | .3 | Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.  |
|                        | .4 | Tightly Fitted; (ref: NBC 2005, Division B, Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.<br>.1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation. |
| <u>1.3 SUBMITTALS</u>  | .1 | Provide submittals in accordance with Section 01 33 00.   |
|                        | .2 | Product Data:   |
-

1.3 SUBMITTALS  
(Cont'd)

- .2 (Cont'd)
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets
- .3 Shop Drawings:
  - .1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.
  - .2 Construction details should accurately reflect actual job conditions.
- .4 Quality assurance submittals: submit following in accordance with Section 01 45 00.
  - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .2 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

1.4 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance with Section 01 61 00.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate manufacturer.
- .2 Storage and Protection:
  - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.
- .3 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Fire stopping and smoke seal systems: in accordance with CAN/ULC-S115.
  - .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN/ULC-S115 and not to exceed opening sizes for which they are intended.
  - .2 Fire stop system rating: F.
- .2 Service penetration assemblies: systems tested to CAN/ULC-S115.
- .3 Service penetration fire stop components: certified by test laboratory to CAN/ULC-S115.
- .4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 PREPARATION

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
  - .1 Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
- .3 Maintain insulation around pipes and ducts penetrating fire separation.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 INSTALLATION

- .1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.
- .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
- .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- .4 Tool or trowel exposed surfaces to neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

3.4 SEQUENCES OF  
OPERATION

- .1 Proceed with installation only when submittals have been reviewed by Departmental Representative.
- .2 Mechanical pipe insulation: certified fire stop system component.
  - .1 Ensure pipe insulation installation precedes fire stopping.

3.5 FIELD QUALITY  
CONTROL

- .1 Inspections: notify Departmental Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 11.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

- .1 Fire stop and smoke seal at:
  - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
  - .2 Intersection of fire-resistance rated masonry and gypsum board partitions.
  - .3 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
  - .4 Openings and sleeves installed for future use through fire separations.
  - .5 Around mechanical and electrical assemblies penetrating fire separations.
  - .6 Rigid ducts: greater than 129 cm<sup>2</sup>: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.





## PART 1 - GENERAL

- |                               |    |  |
|-------------------------------|----|--|
| <u>1.1 REFERENCES</u>         | .1 | Architectural Painting Specifications Manual, Master Painters Institute (MPI).   |
|                               | .1 | Architectural Painting Specification Manual - current edition.   |
|                               | .2 | Maintenance Repainting Manual - current edition.   |
|                               | .2 | National Fire Code of Canada 2015.   |
| <u>1.2 QUALITY ASSURANCE</u>  | .1 | Conform to latest MPI requirements for interior painting work including preparation and priming.   |
|                               | .2 | Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) shall be in accordance with MPI Painting Specification Manual "Approved Product" listing and shall be from a single manufacturer for each system used. |
| <u>1.3 SCHEDULING OF WORK</u> | .1 | Schedule painting operations to prevent disruption of occupants in and about the building.   |
| <u>1.4 SUBMITTALS</u>         | .1 | Submit product data and manufacturer's installation/application instructions for each paint and coating product to be used in accordance with Section 01 33 00.  |
|                               | .2 | Submit WHMIS MSDS.- Material Safety Data Sheets.   |
| <u>1.5 SAMPLES</u>            | .1 | Submit full range colour sample chips in accordance with Section 01 33 00. Indicate where colour availability is restricted.   |
|                               | .2 | Submit 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards.  |
-

1.5 SAMPLES  
(Cont'd)

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- .3 When approved, sample panels shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

1.6 DELIVERY,  
HANDLING AND  
STORAGE

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- .1 Deliver, store and handle materials in accordance with Section 01 61 00.
- .2 Labels shall clearly indicate:
  - .1 Manufacturer's name and address.
  - .2 Type of paint or coating.
  - .3 Compliance with applicable standard.
  - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Provide and maintain dry, temperature controlled, secure storage.
- .5 Observe manufacturer's recommendations for storage and handling.
- .6 Store materials and supplies away from heat generating devices.
- .7 Store materials and equipment in a well ventilated area with temperature range 7°C to 30°C.
- .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.
- .10 Remove paint materials from storage only in quantities required for same day use.
- .11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .12 Fire Safety Requirements:

1.6 DELIVERY,  
HANDLING AND  
STORAGE  
(Cont'd)

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- .12 (Cont'd)
- .1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
  - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
  - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.7 SITE  
REQUIREMENTS

---

- .1 Heating, Ventilation and Lighting:
- .1 Ventilate enclosed spaces.
  - .2 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10°C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .3 Coordinate use of existing ventilation system with Departmental representative and ensure its operation during and after application of paint as required.
  - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
  - .5 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by General Contractor.
- .2 Surface and Environmental Conditions:
- .1 Apply paint finish only in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
  - .2 Apply paint only to adequately prepared surfaces and to surfaces within moisture limits noted herein.
  - .3 Apply paint only when previous coat of paint is dry or adequately cured.

1.8 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 20.
- .2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.,) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
- .3 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems shall be products of a single manufacturer.

2.2 COLOURS

- .1 Colour schedule will be based upon the selection of three colours.
- .2 Selection of colours will be from manufacturers full range of colours.

2.3 MIXING AND  
TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site.
- .2 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 GLOSS/SHEEN  
RATINGS

- .1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following values:

2.4 GLOSS/SHEEN  
RATINGS  
(Cont'd)

Gloss Level Category	Units @ 60°	Units @ 85°
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces as indicated and as noted on Finish Schedule.

2.5 PAINTING  
SYSTEMS

- .1 Metal Fabrications:  
.1 INT 5.1A Quick dry enamel semi-gloss finish.
- .2 Galvanized Metal: doors, frames, etc.  
.1 INT 5.3C Alkyd gloss level 4 finish (doors, frames and ducts)(over cementitious primer).  
.2 RIN 5.3C Alkyd gloss.
- .3 Exterior sliding barriers: At any point within 300mm of contact with floor slab on exterior sliding barriers (B3 & B4), apply low-odour, aluminum-pigmented, high solids, low-stress epoxy mastic prior to finish paint.
- .4 Plaster & GB - walls  
.1 RIN 9.2A - G4 over high hiding sealer.  
.2 IN 9.2A-G4 over latex sealer.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Perform preparation and operations for interior painting in accordance with MPI Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.2 EXISTING  
CONDITIONS

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Departmental representative. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

3.3 PROTECTION

- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Departmental Representative.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Removal of electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings shall be done prior to undertaking any painting operations by General Contractor. Items shall be securely stored and re-installed by General Contractor after painting is completed.

3.3 PROTECTION  
(Cont'd)

- .5 Move and cover equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .6 As painting operations progress, place "WET PAINT" signs in occupied areas to approval of Departmental Representative.

3.4 CLEANING AND  
PREPARATION

- .1 Clean and prepare surfaces in accordance with MPI Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
  - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly.
- .2 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .3 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes.
- .4 Touch up of shop primers with primer as specified in applicable section.

3.5 APPLICATION

- .1 Apply paint by brush or roller. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.

3.5 APPLICATION  
(Cont'd)

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- .2 (Cont'd)
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by Departmental representative.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Backpaint metal fabrications prior to installation to protect surfaces in contact with concrete or masonry at exterior locations.
- .4 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .6 Sand and dust between coats to remove visible defects.
- .7 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .8 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/  
ELECTRICAL  
EQUIPMENT

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- .1 Unless otherwise specified, paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
  - .2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
  - .3 Do not paint over nameplates.
-



3.7 FIELD QUALITY  
CONTROL

- .1 Field inspection of painting operations to be carried by Departmental Representative.
- .2 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Co-operate with Departmental Representative and provide access to areas of work.

3.8 RESTORATION

- .1 Clean and re-install all hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition.



PART 1 - GENERAL

- |  |    |  |
|--|----|--|
| <u>1.1 RELATED SECTIONS</u>  | .1 | Section 32 31 13 - Chain Link Fences and Gates   |
|  | .2 | Section 11 19 13 - Detention Doors Panels and Frames   |
|  | .3 | Section 26 05 00 - Common Work Results for Electrical  |
| <u>1.2 HARDWARE LIST</u>   | .1 | Submit hardware schedule in accordance with Section 01 33 00.  |
|  | .2 | Clearly indicate hardware proposed including make, model, material, function, finish and all other pertinent information.  |
| <u>1.3 SHOP DRAWINGS, PRODUCT DATA AND INSTALLATION INSTRUCTIONS</u> | .1 | Submit shop drawings and product data in accordance with Section 01 33 00.   |
|  | .2 | Clearly indicate all information required for proper preparation and application of hardware.  |
|  | .3 | Submit shop drawings for each type locking device to show fabrication, layout, setting and erection details.   |
|  | .4 | Submit wiring diagrams and service requirements for electrically operated hardware and equipment.  |
|  | .5 | Furnish gate manufacturers with complete instructions and templates for preparation of their work to receive hardware.   |
| <u>1.4 MAINTENANCE DATA AND INSTRUCTIONS</u>                         | .1 | Provide maintenance data, parts list and manufacturer's instructions for each type of lock, cremone bolt set, door closer, door holder, electric deadbolt, and locking device for incorporation into maintenance manual specified in Section 01 78 00. |
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1.4 MAINTENANCE DATA AND INSTRUCTIONS (Cont'd)	.2	Brief maintenance staff regarding proper care of hardware and locking devices, such as lubrication, adjustment, cleaning, and general instructions.
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1.5 MAINTENANCE MATERIALS	.1	Supply two spanner tools for each size spanner screw on job.
	.2	Supply two sets of wrenches for each type of door closer.

1.6 DELIVERY AND STORAGE	.1	Store all hardware and locking devices in locked, clean and dry area.
	.2	Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

## PART 2 - PRODUCTS

2.1 HARDWARE ITEMS	.1	Use one manufacturer's products only for all similar items.
	.2	Hardware for additions or alterations to existing institutions to match existing hardware for make, material, finish, and to be keyed into the existing system at the manufacturer's plant.
	.3	Folger Adam will be the standard of acceptance for all detection locks. All proposed hardware must meet or exceed the performance specifications of similar Folger Adam products.
	.4	All other locks must be able to receive "Best" cylinder cores.

2.2 FASTENING DEVICES	.1	Provide security screws, security nuts, rivets, spanner screws or other equally secure approved devices for affixing various hardware items.
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2.2 FASTENING  
DEVICES  
(Cont'd)

- .2 Use only rivets, security screws, or security nuts at locations where maximum security against removal is required.
- .3 Use spanner screws only at locations where security against removal is not as important, and where it is necessary to remove and repair items from time to time.
- .4 Security screws and nuts to have an extra head which twists off when screw or nut is fully secured, leaving main head without holes or slots for insertion of tool for removal.
- .5 Spanner screws to have slots or holes that require a special spanner tool to remove screws.
- .6 Round head screws not acceptable except at locations approved where material is not thick enough to permit counter-sinking.
- .7 Standard screws not acceptable.
- .8 Use fasteners compatible with material through which they pass.
- .9 Exposed fastening devices to match finish of hardware.

2.3 KEYING

- .1 Prepare keying schedule in consultation with Departmental Representative. Keying system to include keying alike in groups, and keying differently. Submit schedule for approval.
- .2 Master keying not allowed.
- .3 Construction keying not allowed.
- .4 Provide keys in triplicate for each key-code.
- .5 Stamp key-code numbers on keys, prison lock cases, and institutional lock cylinders. Stamp year of issue on prison keys.
- .6 Deliver keys via bonded courier or registered mail to person and place designated by Departmental Representative.

2.3 KEYING  
(Cont'd)

- .7 Certify that lock manufacturer maintains a register listing all key-codes issued to this project to ensure that replacement keys may be ordered by key-code number only in future, and that locks added in future will not accidentally duplicate existing codes.
- .8 Assign key-code numbers which identify the institution, plus the particular key-code within the institution.
- .9 Key-code numbers which directly relate to the actual physical cuts on the keys are not allowed.

2.4 Hinges

- .1 Hinges shall be:
  - .1 Heavy-duty, steel surface hinge.
  - .2 Stainless steel.
  - .3 C32D finish.
  - .4 Mortise type with security studs.
  - .5 For doors weighing more than 110kg, three hinges (a pair and a half) shall be used. For other doors, two hinges (one pair) shall be used.

2.5 ELECTRO-  
MECHANICAL LOCKS

- .1 Following features are common to all type 7A electro-mechanical locks:
  - .1 All have five lever tumblers of "spring temper" hard brass, each tumbler 3 mm thick and actuated by phosphor bronze spring.
  - .2 All have key cylinders of polished alloy bronze having hardness and tensile strength equal to mild steel. Each cylinder grooved to match and guide similar grooves in key.
  - .3 All operate by key type 14B1, when key operation desired.
  - .4 All have steel cases 5 mm thick.
  - .5 All operate on 115 VAC (standard) or 220 VAC (optional).
- .2 Type 7A1 (for interior swinging door):
  - .1 Lock case not to exceed 341 mm high x 229 mm wide x 81 mm thick.
  - .2 Electric operation motor actuated.
  - .3 Mechanically and automatically deadlock door upon closing.
  - .4 Unlock electrically by push-button. Bolt to stay retracted until door is opened.
  - .5 Unlock manually by key. Bolt to stay retracted until relocked by key.

2.5 ELECTRO-  
MECHANICAL LOCKS  
(Cont'd)

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- .2 (Cont'd)
- .6 Bolt throw 19 mm.
- .7 Finish CP.
- .8 Keyed two sides.
- .9 Include single pole double throw latchbolt switch inside lock.

2.6 DOOR POSITION  
INDICATOR SWITCHES

---

- .1 Door position switch shall be:
  - .1 Fully concealed, self-adjusting.

2.7 ESCUTCHEONS,  
CYLINDER SHIELDS,  
PULL HANDLES

---

- .1 Escutcheon type 11A1:
  - .1 Material, 3 mm thick stainless steel, C32D finish.
  - .2 Outside diameter 76 mm.
  - .3 Fasteners, two 6 mm diameter oval or truss head spanner screws.
  - .4 Double wing.
- .2 Cylinder shield type 11A2:
  - .1 Material, 3 mm thick stainless steel, C32D.
  - .2 Outside diameter 76 mm.
  - .3 Fasteners, two 6 mm diameter oval or truss head spanner screws.
  - .4 Double wing.
- .3 Door pull type 11A5:
  - .1 Material, manganese bronze.
  - .2 Overall length 219 mm.
  - .3 Hand hold 133 mm long.
  - .4 Clearance between grip and door, 38 mm.
  - .5 Fasteners, two 10 mm oval head spanner screws.
  - .6 Finish C32D.

2.8 KEYS

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- .1 Type 14A1:
    - .1 Paracentric type not less than 114 mm in length. Blade to be 22 mm wide x 4 mm thick, with overlapping paracentric grooves to match similar grooves in lock cylinders.
    - .2 Handle to be oval shape, to properly fit hand, 57 mm x 35 mm in size, separated from blade by 13 mm x 38 mm shank to provide clearance for hand.
    - .3 Material, alloy bronze having tensile strength not less than Brinnell 150.
    - .4 Factory stamp assigned key-code number on each key.
-

2.9 KEY OPERATED  
LOCKS

- .1 Door pull:
  - .1 Material, manganese bronze.
  - .2 Overall length 219 mm.
  - .3 Hand hold 133 mm long.
  - .4 Clearance between grip and door, 38 mm.
  - .5 Fasteners, two 10 mm oval head spanner screws.
  - .6 Finish C4.

2.10 AUTOMATIC  
DOOR CLOSER

- .1 Automatic door closer (overhead type):
  - .1 Surface mounted.
  - .2 ULC or ULI labelled.
  - .3 Closer, full hydraulic heavy duty rack and pinion type, with hydraulic back check and adjustable spring power.
  - .4 Finish: Alum.

2.11 KICKPLATES

- .1 .050mm thick, width of door less 35mm, 305mm high, all sides bevelled and corners rounded to ensure there are no sharp edges, counter-sunk screw holes, stainless steel with C32D finish.

PART 3 - EXECUTION

3.1 LEGEND OF  
ABBREVIATIONS USED  
IN HARDWARE  
SCHEDULE

- .1 C4 - satin brass
- .2 C10 - satin bronze
- .3 C15 - satin nickel
- .4 C26D - satin chromium plated
- .5 C28 - satin anodized aluminium
- .6 C32D - satin stainless steel
- .7 CP - prime painted
- .8 Alum - aluminium lacquer
- .9 TL - tan lacquer
- .10 BL - bronze lacquer
- .11 Galv - galvanized



3.1 LEGEND OF  
ABBREVIATIONS USED  
IN HARDWARE  
SCHEDULE  
(Cont'd)

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- .12 K1S - keyed one side
- .13 K2S - keyed two sides
- .14 LS - lead shields
- .15 SCS - security screws (with twist-off heads)
- .16 SPS - Spanner screws
- .17 TB - through bolts

3.2 INSTALLATION

- .1 Install all items as per manufacturer's written instructions.
- .2 Coordinate all low-voltage and line-voltage work with electrical trade to ensure all conduit, cable, boxes, and connections are provided for fully operational systems.

3.3 HARDWARE  
SCHEDULE

- .1 Section 11 19 12.01 Detention Hardware Schedule.



DOOR D1

DOOR D2

DOOR D4

DOOR D5

DOOR D6

DOOR D7

DOOR D8

EA. DOOR:

1 ELECTRIC LOCK 126M-1-01 120VAC MODIFIED\* M0-26D 32D

\*REMOVE EXTERNAL MOUNTING TABS AND  
MODIFY LOCK FOR INTERNAL MOUNTING. MODIFY FRAME  
AS REQUIRED TO FIT LOCK INTO EXISTING PREPARATION.

1 DOOR POS SWITCH 534 CP  
Balance of existing hardware to be reused.

DOOR D3

EA. DOOR:

1 MORTISE LOCK KR-A9372 L/C 32D  
2 KEY CYLINDERS 1E74 C265 RP3 26D (CORES BY OTHERS)  
1 ELECTRIC STRIKE 712-75 LBMLCM 32D  
Balance of existing hardware to be reused.

BARRIER B1

BARRIER B2

BARRIER B3

BARRIER B4

EA. BARRIER

1 LOCKING AND OPERATING DEVICE 57700ECP x K2S

GATE G1

GATE G2

GATE G3

EA. GATE

1 SLIDING GATE OPERATOR SYSTEM 3100-4T x K1S

GATE G4

EA. GATE

1 SLIDING GATE OPERATOR SYSTEM PLUSS x K1S



## PART 1 - GENERAL

- |  |    |   |
|--|----|---|
| <u>1.1 RELATED SECTIONS</u>                    | .1 | Section 09 91 23: Painting.   |
|  | .2 | Section 11 19 12: Detention Hardware.   |
| <u>1.2 REQUIREMENTS OF REGULATORY AGENCIES</u> | .1 | Fabricate and install fire doors and frames to NFPA 80-2010 except where specified otherwise.   |
|  | .2 | Fire doors and frames to be ULC or ULI listed and labelled for fire protection ratings as indicated.  |
| <u>1.3 SHOP DRAWINGS</u>                       | .1 | Submit shop drawings in accordance with Section 01 33 00 and 01 78 00.  |
|  | .2 | Clearly indicate each type material, core thickness, reinforcements, integral and removable stops, location of anchors exposed fastenings, finishes, and arrangement of hardware. |
|  | .3 | Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and in door schedule.   |
|  | .4 | Submit drawings for each type of door, panel, frame, and component.   |

## PART 2 - PRODUCTS

- |                      |    |  |
|----------------------|----|--|
| <u>2.1 MATERIALS</u> | .1 | Sheet steel: commercial quality cold-rolled to ASTM A1008/A1008M-13, Class 1 finish. |
|                      | .2 | Steel plate, shapes and bars: to CAN/CSA-G40.20/G40.21-04(R2009), type 230G or 260W. |
|                      | .3 | Shop paint primer: to CAN/CGSB-1.40-M89(R1997).                                      |
|                      | .4 | Fastening Devices:   |
-

2.1 MATERIALS  
(Cont'd)

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- .4 (Cont'd)
- .1 Provide security screws, security nuts, rivets, spanner screws or other equally secure approved devices for affixing various components.
  - .2 Use only rivets, security screws, or security nuts at locations where maximum security against removal is required.
  - .3 Use spanner screws only at locations where security against removal is not as important and where it is necessary to remove and repair items from time to time.
  - .4 Security screws and nuts to have an extra head which twists off when screw or nut is fully secured, leaving main head without holes or slots for insertion of tool for removal.
  - .5 Spanner screws to have slots or holes that require a special spanner tool to remove screws.
  - .6 Round head screws not acceptable except at locations approved where material is not thick enough to permit counter-sinking.
  - .7 Standard screws not acceptable.
- .5 Grout: Minimum compressive strength of 12.5 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA-A179-04(R2014).

2.2 HOLLOW METAL  
DETENTION DOORS

---

- .1 Fabricate min. 50mm thick hollow metal detention doors as detailed.
  - .2 Doors to have 3 mm side clearance with bevelled edges where necessary to permit operating without binding.
  - .3 Construct doors with 2.8 mm thick cold-rolled sheet steel face sheets both sides, each sheet one piece, formed to corner and meet at middle of door thickness. Provide continuous weld at meeting edges. Welds to be ground smooth and filled.
  - .4 Additional cladding of 2.8 mm sheet steel shall be spot welded to each side of door.
  - .5 Provide internal 3.5 mm thick steel channel banding around entire outside perimeter edge of door, spot welded to face sheets at 76 mm oc. Banding to be continuous, full height and width.
-

2.2 HOLLOW METAL  
DETENTION DOORS  
(Cont'd)

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- .6 Inner reinforcement to be continuous full height true truss design with triangular form, of shape which cannot be altered without changing length of sides. Flat apexes to be resistance spot welded at 70 mm oc horizontally and 76 mm oc vertically.
- .7 Fill void between each flute of reinforcement with minimum 24 kg/m<sup>3</sup> density rock wool, or rigid fibreglass for sound-deadening and fire insulation.
- .8 Provide additional backup reinforcement of 5 mm plate welded in place at hinge reinforcing channel, factory drilled and tapped to receive hinge screws.
- .9 Pull reinforcement to be 10 mm thick x 35 x 254 mm.
- .10 Closer reinforcement to be 2.5 mm thick x 89 mm x 356 mm.
- .11 Provide 2.5 mm thick formed steel channels continuously around all four sides of openings for observation windows, and lock pockets,. Glazing stops to be removable one side only (opposite side from detention side) and held in place with Number 10-24 flat head spanner screws.
- .12 Provide all boxes and conduits required to accommodate wiring in doors where electric locks or limit switches are to be installed.
- .13 Provide drilled and tapped holes for all hardware according to templates furnished by hardware supplier.

2.3 PRESSED STEEL  
FRAMES

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- .1 Fabricate zinc-coated, pressed steel frames, welded construction, for detention doors as detailed.
  - .2 Construct frames with minimum 2.5 mm thick cold-rolled sheet steel.
  - .3 Corners to be fully mitered, Continuously welded and ground smooth.
  - .4 Stops to be formed integrally in frames, minimum 16 x 32 mm size.
-

2.3 PRESSED STEEL  
FRAMES  
(Cont'd)

- .5 For each mortise hinge, provide 5 mm thick reinforcement full depth of jamb spot welded to frame and completely drilled and tapped.
- .6 Provide 12mm thick drilled and tapped reinforcement for all hardware mountings, including door closers. Protect all mortises with steel cover boxes.
- .7 For each jamb mounted electric lock, provide special 2.5 mm thick perimeter housing with 5 mm thick back-up plate for field attachment of lock.
- .8 Provide all boxes and conduits required to accommodate wiring in frames and screens where electric locks or door position indicators are specified.
- .9 Provide appropriate anchorage to floor and wall construction.
- .10 Anchors shall be expansion bolt type, 12.7mm bolt with conduit spacer between the wall and the jamb. After tightening, the bolt head shall be welded so as to provide a non-removeable condition, then ground, dressed, and finished smooth.
- .11 Locate wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .12 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 450 mm on centre maximum.
- .13 Provide 2.5 mm thick x 76 mm steel angle jamb floor anchors.
- .14 Provide two steel channel or angle removable temporary spreaders welded to jambs at bottom of door opening to maintain proper alignment.

2.4 GLAZING

- .1 Provide glazing in openings, as detailed, to the following criteria:
  - .1 32mm laminated polycarbonate plus a 6mm sacrificial layer of tempered glass with an air space between layers.
  - .2 Glazing frame to be 3.2mm rolled steel, or 4mm thick steel flats.



<u>2.4 GLAZING</u> (Cont'd)	.1	(Cont'd)
	.3	Glazing stops to be 4mm thick angle steel or solid bar with 25mm engagement, held by 9.6mm dia. security screws set at 150mm o.c..

<u>2.5 SHOP PAINTING</u>	.1	Apply one coat of paint primer to steel and ferrous metal with exception of stainless steel, and those zinc-coated or galvanized.
	.2	Clean, prepare surfaces and apply primer in accordance with manufacturer's instructions.
	.3	Remove blemishes and foreign matter by automatic pressure sanding both faces of each hollow metal door. Spot glaze imperfections with metallic filler and sand smooth.

PART 3 - EXECUTION

<u>3.1 FRAME INSTALLATION</u>	.1	Set frames plumb, square, level at correct elevation.
	.2	Secure anchorages and connections to adjacent construction.
	.3	Brace frames rigidly in position while building-in. Install temporary horizontal and vertical wood spreaders as necessary to maintain frame alignment. Remove temporary steel and wood spreaders after frames are built-in.
	.4	Fill frames with grout. Sufficiently support frame and steel panels to prevent any bowing or warping while filling. Remove supports after grout has set.

<u>3.2 DOOR AND PANEL INSTALLATION</u>	.1	Install doors and hardware in accordance with templates and manufacturer's instructions.
	.2	Adjust operable parts for correct function.



## PART 1 – GENERAL

- 1.1 REFERENCES
- .1 Canadian Standards Association (CSA International)
    - .1 CSA C22.1-06, Canadian Electrical Code, Part 1 (20th Edition), Safety Standard for Electrical Installations.
    - .2 CAN3-C235-83(R2000), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
  - .2 Electrical and Electronic Manufacturer's Association of Canada (EEMAC)
    - .1 EEMAC 2Y-1-1958, Light Gray Colour for Indoor Switch Gear.
  - .3 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
    - .1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.
- 1.2 DEFINITIONS
- .1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.
- 1.3 DESIGN REQUIREMENTS
- .1 Operating voltages: to CAN3-C235.
  - .2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
    - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
  - .3 Language operating requirements: provide identification nameplates and labels for control items in English and French.
  - .4 Use one nameplate or label for each language.
- 1.4 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Product Data: submit WHMIS MSDS in accordance with Section 01 47 15 - Sustainable Requirements: Construction and Section 02 81 01 - Hazardous Materials.
  - .3 Shop drawings:
    - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province s Territory ies of , Canada.
    - .2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
    - .3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
    - .4 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.
    - .5 Submit drawings and product data to authority having jurisdiction and/or inspection authorities.
    - .6 If changes are required, notify Departmental Representative of these changes before they are made.
  - .4 Quality Control: in accordance with Section 01 45 00 - Quality Control.

- .1 Provide CSA certified equipment and material.
    - .2 Where CSA certified equipment and material is not available, submit such equipment and material to authority having jurisdiction for special approval before delivery to site.
    - .3 Submit test results of installed electrical systems and instrumentation.
    - .4 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Departmental Representative.
  - .5 Manufacturer's Field Reports: submit to Departmental Representative DCC Representative Consultant manufacturer's written report, within 3 days of review, verifying compliance of Work and electrical system and instrumentation testing, as described in PART 3 - FIELD QUALITY CONTROL.
- 1.5 QUALITY ASSURANCE
- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
  - .2 Site Meetings:
    - .1 In accordance with Section 01 31 19 - Construction Progress Schedule - Critical Path Method (CPM) Section 01 31 19 - Construction Progress Schedule - Bar (GANTT) Charts .
  - .3 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- 1.6 DELIVERY, STORAGE AND HANDLING
- .1 Material Delivery Schedule: provide Departmental Representative with schedule within 2 weeks after award of Contract.
  - .2 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.
- 1.7 SYSTEM STARTUP
- .1 Instruct Departmental Representative and operating personnel in operation, care and maintenance of systems, system equipment and components.
  - .2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.
  - .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant will aspects of its care and operation.
- 1.8 OPERATING INSTRUCTIONS
- .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
  - .2 Operating instructions to include following:
    - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
    - .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
    - .3 Safety precautions.
    - .4 Procedures to be followed in event of equipment failure.
    - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.

## PART 2 - PRODUCTS

- |   |    |  |
|---|----|--|
| 2.1 MATERIALS AND EQUIPMENT                 | .1 | Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.  |
|   | .2 | Material and equipment to be CSA certified. Where CSA certified material and equipment is not available, obtain special approval from authority having jurisdiction inspection authorities before delivery to site and submit such approval as described in PART 1 - SUBMITTALS.   |
|   | .3 | Factory assemble control panels and component assemblies.  |
| 2.2 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS | .1 | Verify installation and co-ordination responsibilities related to motors, equipment and controls, as indicated.  |
|   | .2 | Control wiring and conduit: in accordance with Section 26 29 03 - Control Devices except for conduit, wiring and connections below 50 V which are related to control systems specified in mechanical sections and as shown on mechanical drawings.   |
| 2.3 WARNING SIGNS                           | .1 | Warning Signs: in accordance with requirements of authority having jurisdiction inspection authorities Departmental Representative.  |
|   | .2 | Porcelain enamel decal signs, minimum size 175 x 250 mm.   |
| 2.4 WIRING TERMINATIONS                     | .1 | Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.   |
| 2.5 EQUIPMENT IDENTIFICATION                | .1 | Identify electrical equipment with nameplates and labels as follows:<br>.1 Nameplates: plastic laminate lamicoide 3 mm thick plastic engraving sheet melamine, black matt white finish face, black white core, lettering accurately aligned and engraved into core mechanically attached with self tapping screws.<br>.2 Sizes as follows: |

NAMEPLATE SIZES			
<b>Size 1</b>	10 x 50 mm	1 line	3 mm high letters
<b>Size 2</b>	12 x 70 mm	1 line	5 mm high letters
<b>Size 3</b>	12 x 70 mm	2 lines	3 mm high letters
<b>Size 4</b>	20 x 90 mm	1 line	8 mm high letters
<b>Size 5</b>	20 x 90 mm	2 lines	5 mm high letters
<b>Size 6</b>	25 x 100 mm	1 line	12 mm high letters
<b>Size 7</b>	25 x 100 mm	2 lines	6 mm high letters

- |    |  |
|----|--|
| .2 | Labels: embossed plastic labels with 6mm high letters unless specified otherwise.                      |
| .3 | Wording on nameplates and labels to be approved by Departmental Representative prior to manufacture.   |
| .4 | Allow for minimum of twenty-five (25) letters per nameplate and label.                                 |
| .5 | Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics. |
| .6 | Terminal cabinets and pull boxes: indicate system and voltage.   |

- 2.6 WIRING IDENTIFICATION .1 Identify wiring with permanent indelible identifying markings, numbered coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA C22.1.
- .4 Use colour coded wires in communication cables, matched throughout system.
- 2.7 CONDUIT AND CABLE IDENTIFICATION .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

	Prime	Auxiliary
Up to 250 V	Yellow	
Up to 600 V	Yellow	Green
Up to 5 kV	Yellow	Blue
Up to 15 kV	Yellow	Red
Telephone	Green	
Other Communication Systems	Green	Blue
Fire Alarm	Red	
Emergency Voice	Red	
Other Security Systems	Red	Yellow

- 2.8 FINISHES .1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.
- .1 Paint outdoor electrical equipment "equipment green" finish to .
- .2 Paint indoor switchgear and distribution enclosures light gray to EEMAC 2Y-1 .

### PART 3 - EXECUTION

- 3.1 INSTALLATION .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.
- .2 Do overhead and underground systems in accordance with CSA C22.3 No.1 except where specified otherwise.
- 3.2 NAMEPLATES AND LABELS .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.
- 3.3 CONDUIT AND CABLE INSTALLATION .1 Install conduit and sleeves prior to pouring of concrete.
- .1 Sleeves through concrete: schedule 40 steel pipe plastic sheet metal, sized for free passage of conduit, and protruding 50 mm.
- .2 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.

	.3	Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.
3.4 LOCATION OF OUTLETS	.1	Locate outlets in accordance with Section 26 05 32 - Outlet Boxes, Conduit Boxes and Fittings.
	.2	Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.
	.3	Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.
	.4	Locate light switches on latch side of doors. .1 Locate disconnect devices in mechanical and elevator machine rooms on latch side of floor.
3.5 MOUNTING HEIGHTS	.1	Mounting height of equipment is from finished floor to <b><u>CENTRELINE</u></b> of equipment unless specified or indicated otherwise.
	.2	If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
	.3	Install electrical equipment at following heights unless indicated otherwise. .1 Local switches: 1100 mm. .2 Wall receptacles: .1 General: 300 mm. .2 Above top of continuous baseboard heater: 200 mm. .3 Above top of counters or counter splash backs: 175 mm. .4 In mechanical rooms: 1400 mm. .3 Panelboards: as required by Code or as indicated. .4 Telephone and interphone outlets: 300 mm. .5 Wall mounted telephone and interphone outlets: 1200 mm. .6 Fire alarm stations: 1200 mm. .7 Fire alarm bells: 2100mm. .8 Television outlets: 300 mm. .9 Wall mounted speakers: 2100mm. .10 Clocks: 2100 mm. .11 Door bell pushbuttons: 1100mm.
3.6 FIELD QUALITY CONTROL	.1	Load Balance: .1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes. .2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment. .3 Provide upon completion of work, load balance report as directed in PART 1 - SUBMITTALS: phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.
	.2	Conduct following tests in accordance with Section 01 45 00 - Quality Control. .1 Power generation and distribution system including phasing, voltage, grounding and load balancing. .2 Circuits originating from branch distribution panels.

- .3 Lighting and its control.
    - .4 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.
    - .5 Systems: fire alarm system communications.
    - .6 Insulation resistance testing:
      - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
      - .2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.
      - .3 Check resistance to ground before energizing.
  - .3 Carry out tests in presence of Departmental Representative.
  - .4 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
  - .5 Manufacturer's Field Services:
    - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
    - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
    - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.
- 3.7 CLEANING
- .1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.
  - .2 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.



## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 CSA International
  - .1 CAN/CSA-C22.2 No.18-98(R2003), Outlet Boxes, Conduit Boxes and Fittings.
  - .2 CAN/CSA-C22.2 No.65-03(R2008), Wire Connectors (Tri-National Standard with UL 486A-486B and NMX-J-543-ANCE-03).
- .2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
  - .1 EEMAC 1Y-2-1961, Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).
- .3 National Electrical Manufacturers Association (NEMA).

### 1.2 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wire and box connectors from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Pressure type wire connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper alloy or sized to fit copper or conductors as required.
- .2 Fixture type splicing connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper alloy sized to fit copper conductors 10 AWG or less.
- .3 Clamps or connectors for armoured cable, TECK cable as required to: CAN/CSA-C22.2 No.18.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wire and box connectors installation in accordance with manufacturer's written instructions.
  - .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### 3.2 INSTALLATION

- .1 Remove insulation carefully from ends of conductors and cables and:
  - .1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.
  - .2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet

secureness tests in accordance with CAN/CSA-C22.2 No.65.

.3 Install fixture type connectors and tighten to CAN/CSA-C22.2 No.65.  
Replace insulating cap.

.4 Install bushing stud connectors in accordance with EEMAC 1Y-2 NEMA.

### 3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

## PART 1 - GENERAL

### 1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA C22.2 No. 18-98(R2003), Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.
  - .2 CSA C22.2 No. 45-M1981(R2003), Rigid Metal Conduit.
  - .3 CSA C22.2 No. 56-04, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
  - .4 CSA C22.2 No. 83-M1985(R2003), Electrical Metallic Tubing.
  - .5 CSA C22.2 No. 211.2-M1984(R2003), Rigid PVC (Unplasticized) Conduit.
  - .6 CAN/CSA C22.2 No. 227.3-05, Nonmetallic Mechanical Protection Tubing (NMPT), A National Standard of Canada (February 2006).

### 1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.

## PART 2 - PRODUCTS

### 2.1 CABLES AND REELS

- .1 Provide cables on reels or coils.
  - .1 Mark or tag each cable and outside of each reel or coil, to indicate cable length, voltage rating, conductor size, and manufacturer's lot number and reel number.
- .2 Each coil or reel of cable to contain only one continuous cable without splices.
- .3 Identify cables for exclusively dc applications.
- .4 Reel and mark shielded cables rated 2,001 volts and above.

### 2.2 CONDUITS

- .1 Rigid metal conduit: to CSA C22.2 No. 45, galvanized steel threaded.
- .3 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.
- .4 Rigid pvc conduit: to CSA C22.2 No. 211.2.

### 2.3 CONDUIT FASTENINGS

- .1 One hole steel straps to secure surface conduits 50 mm and smaller.
  - .1 Two hole steel straps for conduits larger than 50 mm.
- .2 Beam clamps to secure conduits to exposed steel work.
- .3 Channel type supports for two or more conduits at 1.2 m on centre.
- .4 Threaded rods, 6 mm diameter, to support suspended channels.

### 2.4 CONDUIT FITTINGS

- .1 Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified. Coating: same as conduit.

	.2	Ensure factory "ells" where 90 degrees bends for NPS 1 25 mm and larger conduits.
	.3	Watertight connectors and couplings for EMT.
	.1	Set-screws are not acceptable.
2.5 EXPANSION FITTINGS FOR RIGID CONDUIT	.3	Weatherproof expansion fittings for linear expansion at entry to panel.
2.6 FISH CORD	.1	Polypropylene.
PART 3 – EXECUTION		
3.1 MANUFACTURER'S INSTRUCTIONS	.1	Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
3.2 INSTALLATION	.1	Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
	.2	Conceal conduits except in mechanical and electrical service rooms in unfinished areas.
	.3	Surface mount conduits except .
	.4	Use rigid galvanized steel threaded conduit except where specified otherwise.
	.6	Use electrical metallic tubing (EMT) except in cast concrete above 2.4 m not subject to mechanical injury.
	.7	Use rigid pvc conduit underground.
	.12	Minimum conduit size for lighting and power circuits: 19 mm.
	.15	Bend conduit cold:
	.1	Replace conduit if kinked or flattened more than 1/10th of its original diameter.
	.16	Mechanically bend steel conduit.
	.17	Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
	.18	Install fish cord in empty conduits.
	.20	Remove and replace blocked conduit sections.
	.1	Do not use liquids to clean out conduits.
	.21	Dry conduits out before installing wire.
3.3 SURFACE CONDUITS	.1	Run parallel or perpendicular to building lines.
	.2	Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.
	.3	Run conduits in flanged portion of structural steel.

- |                             |    |  |
|-----------------------------|----|--|
|                             | .4 | Group conduits wherever possible on suspended surface channels.  |
|                             | .5 | Do not pass conduits through structural members except as indicated.   |
|                             | .6 | Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.                         |
| 3.4 CONCEALED<br>CONDUITS   | .1 | Run parallel or perpendicular to building lines.   |
|                             | .2 | Do not install horizontal runs in masonry walls.   |
|                             | .3 | Do not install conduits in terrazzo or concrete toppings.  |
| 3.7 CONDUITS<br>UNDERGROUND | .1 | Slope conduits to provide drainage.  |
|                             | .2 | Waterproof joints (pvc excepted) with heavy coat of bituminous paint.  |
| 3.8 CLEANING                | .1 | Proceed in accordance with Section 01 74 11 - Cleaning.  |
|                             | .2 | On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment. |



## PART 1 - GENERAL

- |   |    |  |
|---|----|--|
| 1.1 REFERENCES                          | .1 | Canadian Standards Association (CSA International).  |
|   | .1 | CSA-C22.2 No. 5-02, Moulded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, tenth edition, and the second edition of NMX-J-266-ANCE). |
| 1.2 ACTION AND INFORMATIONAL SUBMITTALS | .1 | Submit product data in accordance with Section 01 33 00 - Submittal Procedures.  |
| 1.3 WASTE MANAGEMENT AND DISPOSAL       | .1 | Separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.  |
|   | .2 | Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.              |
|   | .3 | Separate for reuse and recycling and place in designated containers Steel Metal and Plastic waste in accordance with Waste Management Plan.  |

## PART 2 - PRODUCTS

- |                               |    |   |
|-------------------------------|----|---|
| 2.1 BREAKERS GENERAL          | .1 | Moulded-case circuit breakers,: to CSA C22.2 No. 5  |
|                               | .2 | Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.   |
|                               | .3 | Plug-in moulded case circuit breakers: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.  |
|                               | .4 | Common-trip breakers: with single handle for multi-pole applications.   |
|                               | .5 | Circuit breakers to have minimum symmetrical rms interrupting capacity rating matching the rating of the existing breakers.   |
| 2.2 THERMAL MAGNETIC BREAKERS | .1 | Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection. |

## PART 3 - EXECUTION

- |                  |    |  |
|------------------|----|--|
| 3.1 INSTALLATION | .1 | Install circuit breakers as indicated. |
|------------------|----|--|





PART 1 - GENERAL

1.1 REFERENCES	.1	CSA International
	.1	CSA C22.2 No.14-10, Industrial Control Equipment.
	.2	National Electrical Manufacturers Association (NEMA)
	.1	NEMA ICS 1-2000(R2008), Industrial Control and Systems: General Requirements.
1.2 ACTION AND INFORMATIONAL SUBMITTALS	.1	Submit in accordance with Section 01 33 00 - Submittal Procedures.
	.2	Product Data:
	.1	Submit manufacturer's instructions, printed product literature and data sheets for control devices and include product characteristics, performance criteria, physical size, finish and limitations.
	.3	Shop Drawings:
	.1	Submit drawings stamped and signed by professional engineer registered or licensed in Province Territory of , Canada.
	.2	Include schematic, wiring, interconnection diagrams.
1.3 QUALITY ASSURANCE	.1	Conduct tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
1.4 CLOSEOUT SUBMITTALS	.1	Submit in accordance with Section 01 78 00 - Closeout Submittals.
	.2	Operation and Maintenance Data: submit operation and maintenance data for control devices for incorporation into manual.
1.5 DELIVERY, STORAGE AND HANDLING	.1	Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
	.2	Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
	.3	Storage and Handling Requirements:
	.1	Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
	.2	Store and protect control devices from nicks, scratches, and blemishes.
	.3	Replace defective or damaged materials with new.

- .4 Develop Construction Waste Management Plan Waste Reduction Workplan related to Work of this Section and in accordance with Section 01 35 21 - LEED Requirements.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.

## PART 2 - PRODUCTS

### 2.1 AC CONTROL RELAYS

- .1 Control Relays: to CSA C22.2 No.14 and NEMA ICS 1.

### 2.2 RELAY ACCESSORIES

- .1 Standard contact cartridges: normally-open - convertible to normally-closed in field.

### 2.3 OPERATOR CONTROL STATIONS

- .1 Enclosure: CSA Type 1, flush mounting:

### 2.4 PUSHBUTTONS

- .1 Heavy duty. Operator recessed flush extend or mushroom type, as indicated. Colour as indicated, with 1-NO and 1-NC contacts. Stop pushbuttons coloured red, labelled " stop".

- |                              |    |  |
|------------------------------|----|--|
| 2.5 INDICATING LIGHTS        | .1 | Standard Heavy duty Oil tight, full voltage, transformer resistor LED type, push-to-test, lens colour: red amber blue green clear white as indicated, supply voltage: V AC DC, lamp voltage: V AC DC, labels as indicated. |
|                              |    |  |
| 2.6 CONTROL AND RELAY PANELS | .1 | CSA Type 1 sheet steel enclosure with hinged padlockable access door, accommodating relays timers, labels, as indicated, factory installed and wired to identified terminals.  |

### PART 3 - EXECUTION

- |                           |    |  |
|---------------------------|----|--|
| 3.1 EXAMINATION           | .1 | Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for control devices installation in accordance with manufacturer's written instructions.<br>.1 Visually inspect substrate in presence of Departmental Representative.<br>.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.<br>.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative. |
|                           |    |  |
| 3.2 INSTALLATION          | .1 | Install pushbutton stations, control and relay panels, control devices and interconnect.   |
|                           |    |  |
| 3.3 FIELD QUALITY CONTROL | .1 | Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.  |
|                           | .2 | Depending upon magnitude and complexity, divide control system into convenient sections, energize one section at time and check out operation of section.  |
|                           | .3 | Upon completion of sectional test, undertake group testing.  |
|                           | .4 | Check out complete system for operational sequencing.  |

### 3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C 117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C 136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D 422-632002, Standard Test Method for Particle-Size Analysis of Soils.
  - .4 ASTM D 698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).
  - .5 ASTM D 1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>).
  - .6 ASTM D 4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
    - .1 CSA-A3001-03, Cementitious Materials for Use in Concrete.
    - .2 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .4 U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

### 1.2 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.

## 1.2 DEFINITIONS (Cont'd)

- .1 (Cont'd)
  - .1 Rock : solid material in excess of 1.00 m<sup>3</sup> and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m<sup>3</sup> bucket. Frozen material not classified as rock.
  - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .3 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .4 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .5 Unsuitable materials:
  - .1 Weak, chemically unstable, and compressible materials.
  - .2 Frost susceptible materials:
    - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D 4318, and gradation within limits specified when tested to ASTM D 422 and ASTM C 136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2
    - .2 Table:
 

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45
    - .3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.
- .6 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

## 1.3 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Preconstruction Submittals:

1.3 SUBMITTALS  
(Cont'd)

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- .2 (Cont'd)
- .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
  - .2 Submit records of underground utility locates, indicating: location plan of relocated and abandoned services, as required.

1.4 QUALITY  
ASSURANCE

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- .1 Health and Safety Requirements:
- .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.5 WASTE  
MANAGEMENT AND  
DISPOSAL

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- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20 Construction/Demolition Waste Management and Disposal.
- .2 Divert excess aggregate materials from landfill to local facility for reuse as directed by the Departmental Representative.

1.6 EXISTING  
CONDITIONS

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- .1 Buried services:
- .1 Before commencing work verify location of buried services on and adjacent to site.
  - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
  - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
  - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
  - .5 Prior to beginning excavation Work, notify applicable authorities having jurisdiction establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
  - .6 Confirm locations of buried utilities by careful test excavations.
  - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.

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|--|----|---|
| 1.6 EXISTING<br>CONDITIONS<br>(Cont'd) | .1 | (Cont'd)<br>.8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing, re-routing.<br>.9 Record location of maintained, re-routed and abandoned underground lines.<br>.10 Confirm locations of recent excavations adjacent to area of excavation.   |
|  | .2 | Existing buildings and surface features:<br>.1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.<br>.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative. |

## PART 2 - PRODUCTS

- |               |    |  |
|---------------|----|--|
| 2.1 MATERIALS | .1 | Base material: Granular 'A' as per OPSS 1010.            |
|               | .2 | Subbase material: Granular 'B' Type II as per OPSS 1010. |
|               | .3 | Backfill: Select subgrade fill as per OPSS 1010.         |

## PART 3 - EXECUTION

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|--|----|--|
| 3.1 TEMPORARY<br>EROSION AND<br>SEDIMENTATION<br>CONTROL | .1 | Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent. |
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|--|----|--|
| 3.1 TEMPORARY<br>EROSION AND<br>SEDIMENTATION<br>CONTROL<br>(Cont'd) | .2 | Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.  |
|  | .3 | Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.  |
| 3.2 SITE<br>PREPARATION  | .1 | Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.  |
|  | .2 | Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.  |
| 3.3<br>PREPARATION/PROTECTION  | .1 | Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.  |
|  | .2 | Keep excavations clean, free of standing water, and loose soil.  |
|  | .3 | Where soil is subject to significant volume change due to change in moisture content, cover and protect to the approval of the Departmental Representative.                                    |
|  | .4 | Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage. |
|  | .5 | Protect buried services that are required to remain undisturbed.   |
| 3.4 STOCKPILING  | .1 | Stockpile fill materials in areas designated by Departmental Representative.<br>.1 Stockpile granular materials in manner to prevent segregation.  |
|  | .2 | Protect fill materials from contamination.   |
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|--|----|---|
| <u>3.4 STOCKPILING<br/>(Cont'd)</u>            | .3 | Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.   |
| <u>3.5 DEWATERING AND<br/>HEAVE PREVENTION</u> | .1 | Keep excavations free of water while Work is in progress.   |
|  | .2 | Provide for Departmental Representative's review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.   |
|  | .3 | Protect open excavations against flooding and damage due to surface run-off.  |
|  | .4 | Dispose of water in accordance with Section 01 35 43 - Environmental Procedures to approved runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction.<br>.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits. |
|  | .5 | Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.  |
| <u>3.6 EXCAVATION</u>                          | .1 | Excavate to lines, grades, elevations and dimensions as indicated.  |
|  | .2 | Remove concrete masonry paving walks demolished foundations and rubble and other obstructions encountered during excavation.  |
|  | .3 | Excavation must not interfere with bearing capacity of adjacent foundations.  |
|  | .4 | For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.  |
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### 3.6 EXCAVATION (Cont'd)

- .5 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.
- .6 Restrict vehicle operations directly adjacent to open trenches.
- .7 Dispose of surplus and unsuitable excavated material off site.
- .8 Do not obstruct flow of surface drainage or natural watercourses.
- .9 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .10 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
- .11 Correct unauthorized over-excavation as follows:
  - .1 Fill under other areas with Type 2 fill compacted to not less than 95% of corrected Standard Proctor maximum dry density.

### 3.7 FILL TYPES AND COMPACTION

- .1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D 698ASTM D 1557.
  - .1 Exterior side of perimeter walls: use Type 3 fill to subgrade level. Compact to 95 % of corrected maximum dry density.

### 3.8 BEDDING AND SURROUND OF UNDERGROUND SERVICES

- .1 Place material for bedding and surround of underground services as indicated.
- .2 Place bedding and surround material in unfrozen condition.

### 3.9 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
    - .1 Departmental Representative has inspected and approved installations.
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### 3.9 BACKFILLING (Cont'd)

- .1 (Cont'd)
- .2 Inspection, testing, approval, and recording location of underground utilities.
- .3 Removal of concrete formwork.
- .4 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 300 mm compacted thickness up to design subgrade elevations. Compact each layer before placing succeeding layer.

### 3.10 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 20 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .3 Reinstate grass areas with topsoil and sod, as specified on Drawings.
- .4 Clean and reinstate areas affected by Work as directed by Departmental Representative.

## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM C 88-05, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
  - .2 ASTM C 117-04, Standard Test Method for Material Finer Than 0.075 (No. 200) mm Sieve in Mineral Aggregates by Washing.
  - .3 ASTM C 123-04, Standard Test Method for Lightweight Particles in Aggregate.
  - .4 ASTM C 127-07, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
  - .5 ASTM C 128-07, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.
  - .6 ASTM C 131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .7 ASTM C 136-06, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .8 ASTM D 698-07, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).
  - .9 ASTM D 995-95b(2002), Standard Specification for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
  - .10 ASTM D 1557-07, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>).
  - .11 ASTM D 1559-89, Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus, was withdrawn in 1998 with no replacement.
  - .12 ASTM D 3203-05, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
  - .13 ASTM D 4318-05, Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
  - .14 ASTM D 4791-05, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .2 Asphalt Institute (AI)

# 1.1 REFERENCES (Cont'd)

- .2 (Cont'd)
- .1 AI MS-2-1993 Sixth Edition, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves Testing, Woven Wire, Metric.
  - .3 CAN/CGSB-16.1-M89, Cutback Asphalts for Road Purposes.
  - .4 CAN/CGSB-16.2-M89, Emulsified Asphalts, Anionic Type, for Road Purposes.
  - .5 CAN/CGSB-16.3-M90, Asphalt Cements for Road Purposes.

# 1.2 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit asphalt concrete mix design to Departmental Representative for review.
- .3 Materials to be tested by accredited testing laboratory.
- .4 Submit test certificates showing suitability of materials at least 4 weeks prior to commencing work.
- .5 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .6 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing work.

# 1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
  - .2 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
  - .3 Divert unused asphalt materials from landfill to local asphalt recycling facility.
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- |   |    |  |
|---|----|--|
| 1.3 WASTE<br>MANAGEMENT AND<br>DISPOSAL<br>(Cont'd) | .4 | Divert unused aggregate materials from landfill to quarry for reuse.       |
|   | .5 | Fold up metal banding, flatten and place in designated area for recycling. |

## PART 2 - PRODUCTS

- |                      |    |  |
|----------------------|----|--|
| <u>2.1 MATERIALS</u> | .1 | Granular base and sub-base material:<br>.1 Base: Granular 'A' as per OPSS 1010.<br>.2 Sub-base: Granular 'B' Type II as per OPSS 1010.                   |
|                      | .2 | Asphalt concrete aggregates:<br>.1 Granular 'A': OPSS 1010.  |
|                      | .3 | Asphalt cement: to CAN/CGSB-16.3.  |
|                      | .4 | Asphalt prime: to CAN/CGSB-16.1, grade RM-20 MC-70 CAN/CGSB-16.2, grade SS-1.  |
|                      | .5 | Granular base aggregates:<br>.1 Crushed particles: at least 60% of particles by mass retained on 4.75mm sieve to have at least 1 freshly fractures face. |

- |                      |    |  |
|----------------------|----|--|
| <u>2.2 EQUIPMENT</u> | .1 | Pavers: mechanical self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.  |
|                      | .2 | Rollers: sufficient number of rollers of type and weight to obtain specified density of compacted mix.   |
|                      | .3 | Vibratory rollers for parking lots and driveways:<br>.1 Minimum drum diameter: 750 mm.<br>.2 Maximum amplitude of vibration (machine setting): 0.5 mm for lifts less than 40 mm thick.   |
|                      | .4 | Haul trucks: of sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:<br>.1 Boxes with tight metal bottoms.<br>.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded. |
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## 2.2 EQUIPMENT (Cont'd)

- .4 (Cont'd)
- .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
- .5 Suitable hand tools.

## 2.3 MIX DESIGN

- .1 Mix design to AI MS-2.
- .2 Job mix formula to be approved by Departmental Representative.
- .3 Design of mix: by Marshall method to requirements below:
  - .1 Compaction blows on each face of test specimens: 50.
  - .2 Mix physical requirements:
 

Property	Sheet Asphalt	Concrete
Marshall	3.0	5.5
Stability at 60 degrees C, kN minimum.		
Flow Value, mm.	2-5	2-4
Air Voids in Mixture, %	3-5	3-5
Voids in Mineral Aggregate, % minimum	16	15
Index of Retained Stability, % minimum	75	75
  - .3 Measure physical requirements as follows:
    - .1 Marshall load and flow value: to ASTM D 1559.
    - .4 Do not change job-mix without prior approval of Departmental Representative. When change in material source proposed, new job-mix formula to be approved by Departmental Representative.



### PART 3 - EXECUTION

- |  |    |  |
|--|----|--|
| <u>3.1 SUBGRADE<br/>SURFACE<br/>PREPARATION AND<br/>INSPECTION</u> | .1 | Verify grades of items set in paving area for conformity with elevations and sections before placing granular base and sub-base material.  |
|  | .2 | Obtain approval of subgrade by Departmental Representative before placing granular sub-base and base.  |
| <u>3.2 GRANULAR<br/>SUB-BASE AND<br/>GRANULAR BASE</u>             | .1 | Place granular base and sub-base material on clean unfrozen surface, free from snow and ice.   |
|  | .2 | Place granular base and sub-base to compacted thicknesses as indicated. Do not place frozen material.  |
|  | .3 | Place in layers not exceeding 150 mm compacted thickness. Compact to density not less than 98 % corrected maximum dry density ASTM D 698 ASTM D 1557.  |
|  | .4 | Finished base surface to be within 10 mm of specified grade, but not uniformly high or low.  |
| <u>3.3 ASPHALT PRIME</u>   | .1 | Cutback asphalt:<br>.1 Heat asphalt prime for pumping and spraying in accordance with CAN/CGSB-16.1.<br>.2 Apply cutback asphalt prime to granular base, at rate directed by Departmental Representative, but do not exceed 2.2 L/m <sup>2</sup> .<br>.3 Apply on dry surface, unless otherwise directed by Departmental Representative. |
|  | .2 | Do not apply prime when air temperature is less than 5 degrees C or when rain is forecast within 2 hours.  |
|  | .3 | If asphalt prime fails to set within 24 hours, spread sand blotter material in amounts required to absorb excess material. Sweep and remove excess blotter material.   |
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3.4 PLANT AND  
MIXING REQUIREMENTS

- .1 In accordance with ASTM D 995.

3.5 ASPHALT  
CONCRETE PAVING

- .1 Obtain approval of base from Departmental Representative before placing asphalt mix.
- .2 Place asphalt mix only when base or previous course is dry and air temperature is above 5 degrees C and rising.
- .3 Place asphalt concrete in compacted layers not exceeding 50 mm one lift.
- .4 Minimum 135 degrees C mix temperature required when spreading.
- .5 Maximum 160 degrees C mix temperature permitted at any time.
- .6 Compact each course with roller as soon as it can support roller weight without undue cracking or displacement.
- .7 Compact parking lot to density not less than 95 % of density obtained with Marshall specimens prepared in accordance with ASTM D 1559 from samples of mix being used. Roll until roller marks are eliminated.
- .8 Keep roller speed slow enough to avoid mix displacement and do not stop roller on fresh pavement.
- .9 Moisten roller wheels with water to prevent pick up of material.
- .10 Compact mix with hot tampers or other equipment approved by Departmental Representative in areas inaccessible to roller.
- .11 Finish surface to be within 10 mm of design elevation and with no irregularities greater than 10 mm in 4.5 m.
- .12 Repair areas showing checking, rippling or segregation as directed by Departmental Representative.
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### 3.6 JOINTS

- .1 Remove surplus material from surface of previously laid strip. Do not deposit on surface of freshly laid strip.
- .2 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
- .3 Asphalt joints: step connection as per detail drawing.

### 3.7 TESTING

- .1 Inspection and testing of asphalt pavement will be carried out by designated testing laboratory in accordance with Section 01 45 00 - Quality Control.

### 3.8 PROTECTION

- .1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38 degrees C. Do not permit stationary loads on pavement until 24 hours after placement.
- .2 Provide access to buildings as required. Arrange paving schedule so as not to interfere with normal use of premises.



## PART 1 - GENERAL

- |                          |  |    |  |
|--------------------------|--|----|--|
| 1.1 RELATED.<br>SECTIONS |  | .1 | Section 02 41 99 - Demolition.   |
|                          |  | .2 | Section 03 30 00 - Cast-in-Place Concrete  |
|                          |  | .3 | Section 11 19 12 - Detention Hardware.   |
|                          |  | .4 | Section 31 23 33.01 - Excavation, Trenching and Backfilling  |
|                          |  | .5 | Section 32 12 16.02 - Asphalt Paving for Building Sites  |
|                          |  | .6 | Section 26 05 00 - Common Work Results for Electrical  |
| 1.2 REFERENCES           |  | .1 | American Society for Testing and Materials International, (ASTM).  |
|                          |  | .1 | ASTM A53/A53M-07(R2102), Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.                                      |
|                          |  | .2 | ASTM A90/A90M-07(R2103), Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.                      |
|                          |  | .3 | ASTM A121-07(R2013), Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.  |
|                          |  | .4 | ASTM A653/A653M-08(R2013), Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process. |
|                          |  | .5 | ASTM C618-08a, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.                      |
|                          |  | .6 | ASTM F1664-01(R2013), Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.                            |
|                          |  | .2 | Canadian General Standards Board (CGSB).   |
|                          |  | .1 | CAN/CGSB-138.1-96(R1996), Fabric for Chain Link Fence.   |
|                          |  | .2 | CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.   |
|                          |  | .3 | CAN/CGSB-138.3-96, Installation of Chain Link Fence.   |
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<u>1.2 REFERENCES</u> (Cont'd)	.2	(Cont'd)
	.4	CAN/CGSB-138.4-96, Gates for Chain Link Fence.
	.5	CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
	.3	Canadian Standards Association (CSA International).
	.1	CAN/CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
	.2	CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
	.3	CAN/CSA-A3001-08, Cementitious Materials Compendium.
	.4	Department of Justice Canada (Jus).
	.1	Canadian Environmental Protection Act (CEPA), 1999, c. 33.
	.5	Health Canada/Workplace Hazardous Materials Information System (WHMIS).
	.1	Material Safety Data Sheets (MSDS).
	.6	The Master Painters Institute (MPI) - Architectural Painting Specification Manual - 2003.
	.1	MPI # 18, Organic Zinc Rich Primer.
	.7	Transport Canada (TC).
	.1	Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
<u>1.3 SUBMITTALS</u>	.1	Submittals in accordance with Section 01 33 00.
<u>1.4 HEALTH AND SAFETY</u>	.1	Do construction occupational health and safety in accordance with Section 01 35 29.
<u>1.5 WASTE MANAGEMENT AND DISPOSAL</u>	.1	Separate waste materials for reuse and recycling in accordance with Section 01 74 20.
	.2	Remove from site and dispose of packaging materials at appropriate recycling facilities.

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1.5 WASTE  
MANAGEMENT AND  
DISPOSAL  
(Cont'd)

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- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for reuse and recycling and place in designated containers accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with CEPA , TDGA , Regional and Municipal regulations.
- .7 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Departmental Representative.
- .8 Divert unused concrete materials from landfill to local quarry facility as approved by Departmental Representative.
- .9 Unused paint or coating material must be disposed of at official hazardous material collections site as approved by Departmental Representative.
- .10 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .11 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 MATERIALS

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- .1 Concrete mixes and materials: in accordance with CAN/CSA-A23.1(R1994).
    - .1 Nominal coarse aggregate size: 20-5.
    - .2 Compressive strength: 20 MPa minimum at 28 days.
    - .3 Additives: fly ash to CAN/CSA-A23.5 ASTM C 618.
  - .2 Chain-link fence fabric: to CAN/CGSB-138.1(R1996).
-

2.1 MATERIALS  
(Cont'd)

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- .2 (Cont'd)
    - .1 Type 1, 4.8mm x 50mm, ClassA, heavy style, Grade 1. Height of fabric: as indicated.
  - .3 Posts, braces and rails: to CAN/CGSB-138.2(R1996), galvanized steel pipe. Dimensions as indicated.
  - .4 Top and bottom tension wire: to CAN/CGSB-138.2, single strand, galvanized steel wire.
  - .5 Tie wire fasteners: 3.7mm galvanized steel wire @ 300mm O.c.
  - .6 Tension bar: to ASTM A 653/A 653M, 5 x 20 mm minimum galvanized steel.
  - .7 Gates posts: Provide a gate post for supporting each gate leaf as follows:
    - .1 Between 1830mm and 3960mm wide: DN75 73mm O.D. pipe grade A.
    - .2 Between 3960mm and 5490mm: DN150 168mm O.D. pipe grade A.
  - .8 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel.
    - .1 Tension bar bands: 3 x 20 mm minimum galvanized steel.
    - .2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
    - .3 Overhang tops to provide waterproof fit, to hold top rails and an outward inward projection to hold barbed wire overhang.
    - .4 Provide projection with clips or recesses to hold 3 strands of barbed concertina wire spaced 100 mm apart.
    - .5 Projection of approximately 300 mm long to project from fence at 45 degrees above horizontal on side indicated.
    - .6 Turnbuckles to be drop forged.
  - .9 Sliding Gate Operator:
    - .1 Drive assembly and locking mechanisms to be enclosed in a corrections grade case and lock, for protection against tampering.
    - .2 Drive assembly mounted on concrete pier between 900mm and 1200mm above grade level.
    - .3 Backup manual crank operator located in the motor box.
-



2.1 MATERIALS  
(Cont'd)

- .10 Gate framing members shall be min. 73mm O.D. pipe weighing 8.6 kg/m, welded and drained.
- .11 Organic zinc rich coating: to CAN/CGSB-1.181 MPI #18.
- .12 Concertina Barbed Tape:
  - .1 Galvanized tape: 20 X .5mm clenched around a 2.5mm diameter spring steel galvanized core wire to form a coil with nominal outside diameter of 710mm. When installed, the coil will have minimum diameter of 635mm.
  - .2 20mm long blade-type barbs spaced at 45mm on centre.
  - .3 Formed by clipping coils together at a minimum of three points on the circumference.
  - .4 Coil, when stretched, to form a cylindrical pattern. Loop spacing not to exceed 230mm.
  - .5 Held in place with two barbed wires stretched and fixed to post arms.
- .13 Barbed wire : to ASTM A 121 2 mm diameter galvanized steel wire or aluminum coated steel wire 4 point barbs 125 mm spacing.
- .14 Grounding rod: 16 mm diameter copperwell rod, 3 m long.

2.2 SLIDING VEHICLE  
GATE (G4)

- .1 System Dimensions: Clear gate opening height and width as indicated on drawings.
- .2 Motors and electrical components:
  - .1 Motors shall be 1 HP, 208/230 Volt, 3 Phase, as produced by a nationally recognized manufacturer.
  - .2 Overload Protection: Motors shall be protected against overload, either by thermal or a current sensing overload device.
  - .3 Gear (Box) Reducer: The self-enclosed gear-head gearbox shall be manufactured as a single unit, and shall consist of a hardened steel machine cut worm and mating bronze gear running in oil bath. Oil shall be #634 specialty oil with a fluid pour point of -44 degrees F. The gearbox shall perform the following functions:
    - .1 Adjustable Clutching Device
    - .2 Manual disconnect by crank handle.

2.2 SLIDING VEHICLE .2  
GATE (G4)  
(Cont'd)

(Cont'd)

.4 Gearbox Heater: Electrical service shall provide power to the thermostat controlling the internal gearbox heater.

.5 Controller: Houses all of the required gate logic components including: relays, limit switches and motor starters with overloads all within a NEMA 4 enclosure.

.6 Main Power Disconnect Switch and Wiring Compartment: When this switch is in the off position, the main power is disconnected from the control unit.

.7 Speed: Minimum of 150 mm per second.

.8 Manual Operation: Crank handle located in the motor box shall provide a three-step engagement procedure for manual operation. The 3 steps are; unlock 1850 gate lock, open motor box, fold out handle. The gate is now ready to be opened or closed.

.9 Control Circuit: 24 VAC control power.

.10 Limits: The operator shall be equipped with an integral limit system that provides accurate settings to control the open and close positions of the gate and shall not be affected by manual operation or motor removal.

.3 Motor Housing:

.1 Water Resistant Motor Box shall be constructed of 10-gauge galvanized steel and is located between 900mm and 1200mm above grade level, for easy maintenance.

.2 Detention Hinges and Tamper Resistance Security Screws shall be used to secure operator enclosure components.

.3 Motor Box Lock: Motor box shall be locked with a prison lock. Provide three (3) paracentric keys per key code.

.4 System Components:

.1 Overhead support structure shall consist of a steel overhead beam of sufficient size to support gate panel and aluminum track as shown on detail drawings.

.2 Fortress truck assembly shall be swivel-type, and be constructed of steel with two axles and four sealed ball-bearings wheels. There shall be two side rollers wheels per truck assembly to ensure proper alignment fo the truck in the track, which are held to the truck bracket by free moving 16 mm diameter center bolt. Each gate panel to be hung on 3 truck assemblies depending on gate opening width.

2.2 SLIDING VEHICLE .4  
GATE (G4)  
(Cont'd)

(Cont'd)

.3 Bottom guides on plates: bottom guides shall be constructed of 9.525 mm x 63.5 mm flat steel, welded to a 6 mm x 127 mm x 267 mm steel plate, which shall be lagged to the concrete footing.

.4 Vertical Support Posts: Consists of 3 sets of support posts (6 posts), and one motor box support post, of min. 101.6 mm O.D. galvanized steel weighing a minimum of 9.76 kg/m, in accordance with ASTM F 1043.

.5 Drive chain shall be #50 roller chain.

.6 Gate guide angle shall consist of 63.5 mm x 38 mm x 6.4 mm steel angle attached to the bottom of the gate panel running full length.

.7 Gate shall have three-point locking (top, bottom, and middle), with an emergency manual control mechanism located for easy access.

.8 Sliding Gate Lock shall be an electro-mechanical lock that is keyed on both sides. Three keys per key code shall be provided.

.9 Gate panel shall be manufactured with galvanized steel pipe meeting the requirements in ASTM F 900. Gate frame shall be welded to form a rigid panel.

.1 Outer Support Members:

.1 SCH 40 (grade A) steel pipe 50 mm O.D. weighing 4kg/m.

.2 Grade B steel tubing 50 mm O.D. weight may differ depending on manufacturer. Product must be equal to SCH 40.

.2 Inner Support Members:

.1 SCH 40 (grade A) steel pipe 50 mm O.D. weighing 4 kg/m.

.2 Grade B steel tubing 50 mm O.D. weight may differ depending on manufacturer. Product must be equal to SCH 40

.3 Gate panel shall be trussed to provide field adjustment.

.5 Function and System Operation:

.1 Push Button Controls: Refer to electrical.

2.3 SLIDING GRILLE .1  
BARRIERS (B1 - B4)

System Description: Provide a high security locking and operating system for installations of sliding barriers B1, B2, B3, and B4.

2.3 SLIDING GRILLE  
BARRIERS (B1 - B4)  
(Cont'd)

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- .2 Unit to be self contained and mounted as shown in drawings, in similar fashion to existing.
  - .3 Modular Design: Electrical and mechanical parts associated with the locking and movement of the door shall be contained on a single plate that is non-handed.
  - .4 Steel parts shall be electroplated for corrosion resistance.
  - .5 Door rollers of hardened steel and turn on permanently lubricated ball bearings.
  - .6 Drive train is to be clutchless and door travel speed to be adjustable electronically by a mechanism plate dial.
  - .7 Capable of reverse door travel direction continuously and instantly without ball bearings.
  - .8 Manual override to enable unlocking without electric power.
  - .9 At barriers B3 and B4, equip operator with internal electric heater, thermostatically operated to maintain minimum temperature of 4.5 degrees C.
  - .10 Component Specifications:
    - .1 Mechanism Plate: Steel plate 225x375x6 mm containing all functional components for locking, operating and indicating status of door.
    - .2 Gear Motor: Standard 115 Volt Amp.
    - .3 Rack and Pinion Drive.
    - .4 Electric door controls to provide adjustable door movement speed via a mechanism plate knob - Refer to Electrical.
    - .5 Track: Cold drawn steel 14 mm diameter welded in place to a right angle steel angle.
    - .6 Door Hanger: 6 mm formed steel construction with 5 mm vertical adjustment via eccentric bushings and 25 mm horizontal slotted adjustment to compensate for field misalignments.
    - .7 Door Rollers: Two turned steel wheels 70 mm O.D. fitted with double shielded, permanently lubricated ball bearings.
    - .8 Bottom Door Guide: 6 mm thick steel construction.
    - .9 Top Lock Bolt: 22 mm O.A. stainless steel.
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- 2.3 SLIDING GRILLE .10 (Cont'd)  
BARRIERS (B1 - B4)  
(Cont'd)
- 
- .10 Bottom Lock: Cast iron body enclosed by 20 mm O.A. stainless steel locking ball.  
.11 Vertical Lock Bar Enclosure: 38 mm square steel tube.  
.12 Door status indication switch 15 amp @ 125/250 volt.
- 2.4 SLIDING MAN .1 Function and System Operation:  
GATES (SECURITY  
GATE) (G1 - G3)
- 
- .1 The sliding gate shall positively lock at two separate locations in the closed and open position within the locking column at the rear of the gate panel.
- .2 System Dimensions:  
.1 Sized as per drawings.
- .3 System Components:  
.1 Motors shall be 1/4 HP.  
.2 Motors shall be protected against overload by either a thermal or a current sensing overload device.  
.3 The Gear Box shall have a right angle worm-gear reduction.  
.4 The normal force exerted by the sliding gate during electric operations shall be a minimum of 18kg.  
.5 An obstruction placed in the path of the gate, having a resistance greater than the factory pre-set limit, shall cause the gate to stop. When the obstruction is removed, the gate shall resume travel in the selected direction.  
.6 A manual release, located in the emergency release column, shall be provided for manual operation.  
.7 Controller shall house all of the required gate logic components including relays, limit switches and motor starters with overloads.  
.8 Control Circuit shall be 110 VAC and operating controller shall be fabricated using UL listed parts.  
.9 Weather Resistant Motor Housing shall be constructed of a minimum 6.4 mm steel plate, frames and stiffened as required.  
.10 Removable front cover panel shall be constructed of 10 gauge galvanized steel.  
.11 All moving parts shall be concealed within the horizontal housing and the locking pilaster.
-

2.4 SLIDING MAN  
GATES (SECURITY  
GATE) (G1 - G3)  
(Cont'd)

- .3 (Cont'd)
  - .12 The doorjamb and vertical members shall be free of hooks or lugs used for locking or any other purpose.
  - .13 Internal electric heaters, thermostatically controlled to maintain minimum temperature of 4.5 degrees C.
  - .14 Include door position indicator that activates an audible signal when door is in open position.
- .4 Chain Link Fence Gate Panel:
  - .1 Gate panel shall be manufactured using 50m square hot dip galvanized steel framing member. Gate frame shall be welded to form a rigid panel.
  - .2 A continuous bottom guide angle shall be provided as part of the gate panel.
  - .3 Tension Bars: Galvanized steel in accordance with ASTM F 626.
  - .4 Brace Bands: 12 gauge galvanized steel.
  - .5 Gate panel filler shall be 13 mm x 76 mm x 4 mm) weld mesh.
- .5 Finish: all exposed system parts shall be zinc galvanized.
- .6 Installed on new or existing concrete foundation, as shown in drawings. An alternate foundation design utilizing a steel grade beam cast in grout will be considered if it reduces gate down time.
- .7 Coordinate with Electrical.

2.5 FINISHES

- .1 Galvanizing:
  - .1 For chain link fabric: to CAN/CGSB-138.1 Grade2.
  - .2 For pipe: 550 g/m<sup>2</sup> minimum to ASTM A 90.
  - .3 For barbed wire: to ASTM A 121, Class 2 CAN/CGSB-138.2.
  - .4 For other fittings: to CAN/CSA-G164.
- .2 Aluminum coating:
  - .1 For barbed wire: to ASTM A 121, Class 2
- .3 For sliding grille barriers, finish as per Section 09 92 23 - Painting.

PART 3 - EXECUTION

3.1 GRADING

- .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.

3.2 ERECTION OF  
FENCE

- .1 Erect fence along lines as indicated and to CAN/CGSB-138.3.
- .2 Excavate post holes to dimensions indicated 1220mm depth x 4 times post diameter.
- .3 Space line posts maximum 2.5 m apart, measured parallel to ground surface.
- .4 Space straining posts at equal intervals not to exceed 60 m if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade, is greater than 60 m.
- .5 Install additional straining posts at sharp changes in grade and where directed by Departmental Representative.
- .6 Install corner post where change in alignment exceeds 10 degrees.
- .7 Install end posts at end of fence and at buildings.
  - .1 Install gate posts on both sides of gate openings.
- .8 Place concrete in post holes then embed posts into concrete to depths indicated.
  - .1 Extend concrete 50 mm above ground level and slope to drain away from posts.
  - .2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.
- .9 Do not install fence fabric until concrete has cured minimum of 5 days.
- .10 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface.
  - .1 Install braces on both sides of corner and straining posts in similar manner.

3.2 ERECTION OF  
FENCE

(Cont'd)

- .11 Install overhang tops and caps.
- .12 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.
- .13 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.
- .14 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.
  - .1 Knuckled selvedge at bottom.
  - .2 Twisted selvedge at top.
- .15 Secure fabric to top rails, middle rails, line posts and bottom tension wire with 3.7mm galvanized steel tie wires at 300 mm intervals.
  - .1 Give tie wires minimum two twists.
- .16 Install concertina wire strands and clip securely to lugs of each projection.
- .17 Install grounding rods as indicated.

3.3 INSTALLATION OF  
GATES

- .1 Install gates in locations as indicated.
- .2 Coordinate all low-voltage and line-voltage work with Electrical trade to ensure all conduit, cable, boxes, and connections are provided for a fully functional system.
- .3 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.
- .4 Install gate stops.
- .5 Provide temporary barriers, gates and security as detailed in the drawings.
- .6 Sequence work so that security is continuous throughout construction, to the satisfaction of the Departmental Representative.



- 3.4 TOUCH UP .1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas as indicated in accordance with Section 09 91 23 - Painting.  
.1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.
- 3.5 CLEANING .1 Clean and trim areas disturbed by operations.  
.1 Dispose of surplus material and replace damaged turf with sod as directed by Departmental Representative.

