



Public Works and
Government Services
Canada

Travaux publics et
Services gouvernementaux
Canada

SPECIFICATIONS FOR
PWGSC – Ontario Region
LaSalle Causeway
Concrete Repairs 2013

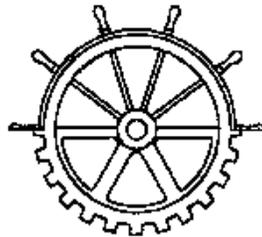
(Kingston, Ontario)

Project No. R.013375.025

Ref. No. OG LSC 13/R11

October 09, 2013

Prepared by:



Heritage Canals and Engineering Works
Professional and Technical Services
Ontario Region
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LaSalle Causeway
Concrete Repairs 2013
Proj. No. R.013375.025

LIST OF DRAWINGS

Section 00 01 15
Page 1
2013-10-09

Drawing Number

Title

OG LSC 13/R11

Cover Page and Location Plan

OG LSC 13/R11 - 100

Plans, Sections and Details I

OG LSC 13/R11 - 101

Plans, Sections and Details II

END

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 General:
- .1 This specification covers the requirements for furnishing of all labour, materials, tools, equipment, transportation and supervision necessary to completely perform the Work, as described by the Drawings and this Specification.
- .2 Description of Work:
- .1 The Work includes varies concrete repairs at the LaSalle Causeway West Bridge, West Wharf and Bascule Bridge.
 - .2 The Work includes but is not limited to:
 - .1 Improving sidewalk tripping hazard (West Bridge - 3 locations).
 - .2 Closing large openings in concrete barriers (West Bridge - 4 locations).
 - .3 Replacing deteriorated concrete retaining wall with new reinforced concrete retaining wall (West Wharf).
 - .4 Demolishing deteriorated concrete capped stone masonry wall and replacing with new reinforced concrete retaining wall (West Wharf).
 - .5 Re-grading existing embankment, rip-rap installation and landscaping.
 - .6 Performing stone masonry repointing within the limits shown on the drawings (West Wharf).
 - .7 Performing concrete cap repairs within limits shown on the drawings (West Wharf).
 - .8 Performing concrete repairs on exterior face of the southwest and southeast wing walls within limits shown on the drawings (Bascule Bridge).
 - .9 Capping existing duct bank along southeast wing wall with new concrete and constructing concrete steps, as described on the drawings.
 - .10 Providing protection to all features which may be affected by the work and, to the satisfaction of the Departmental Representative.
 - .11 Providing Pedestrian Traffic Control throughout the entire project schedule.
 - .12 General clean-up to the satisfaction of the Departmental Representative.

1.2 SITE LOCATION
AND ACCESS

- .1 The LaSalle Causeway is composed of three individual bridges and two wharfs . The historic Strauss trunion Swing (Bascule) Bridge is located centrally within the Causeway between East and West Bridge. The LaSalle Causeway is located at the southern end of the Rideau Canal in the City of Kingston, Ontario. The Causeway connects Highway 2 across the Cataraqui River. Construction was completed on the Bascule Bridge structure in 1917.
- .2 Comply with the local authorities jurisdiction and regulations pertaining to construction site access and Traffic Control.
- .3 Site Location offers minimal staging area and work space. The Site must maintain its functional purpose with minimal interference during construction including the passage of pedestrian traffic. Should the Contractor require additional area for work and storage, the Contractor will be responsible for arranging for permission to use these areas. This includes obtaining releases from the affected owners at end of the project indemnifying the contract and the owner from any claim from the owner of the land used in the form acceptable to the Departmental Representative.
- .4 Site location will include work near open waterways. Comply to all local, provincial and federal regulations pertaining to work around open water.
- .5 Remove snow and ice to allow access and work.
- .6 Before submitting a proposal, a mandatory site visit is required.
- .7 Site location is exposed to high traffic volume across the thorough fare and a Traffic Control Management Plan is mandatory.

1.3 DEPARTMENTAL
REPRESENTATIVE

- .1 PWGSC will appoint or designate a Departmental representative for this contract. The Contractor will be informed in writing of the designated individual or individuals. Should it be required to change the Departmental representative, the Contractor will be informed in writing.

- 1.4 STANDARDS .1 Reference is made to CGSB, ASTM, CSA and other national and international standards. These standards, when quoted, form an integral part of and are to be read in conjunction with the specification as if reproduced herein. The latest edition is applicable, unless a dated edition is specified.
- 1.5 ABBREVIATIONS .1 Abbreviations used are:
- .1 CSA - Canadian Standards Association.
 - .2 NBC - National Building Code of Canada.
 - .3 CHBDC - Canadian Highway bridge Design Code.
 - .4 CGSB - Canadian General Standards Board.
 - .5 GC - General Conditions.
 - .6 MOE - Ministry of the Environment.
 - .7 OPSS - Ontario Provincial Standard Specifications.
 - .8 CWB - Canadian Welding Bureau.
 - .9 ASTM - American Society for Testing and Materials.
 - .10 ANSI - American National Standards Institute.
 - .11 PWGSC - Public Works and Government Services Canada.
 - .12 ACI - American Concrete Institute.
 - .13 DSR - Designated Substance Report.
 - .14 SSPC - Steel Structures Painting Council.
 - .15 NLGA - National Lumber Grades Authority.
 - .16 AWPA - American Wood-Perservers' Association.
- 1.6 DEFINITIONS .1 Unless the context clearly indicates otherwise, the following definitions apply:
- .1 Plans and/or Specifications:
 - .1 Plans - the drawings listed in the "List of Drawings".
 - .2 Specification - the subject matter listed in the "List of Contents", addenda to the specification, and all relative written communications sent by the Departmental Representative to the Contractor in connection with the work.
 - .2 Department - Public Works & Government Services Canada.
 - .3 Sample - includes a specimen prepared for testing or approval.
 - .4 Sampling - includes preparation of a specimen normally performed prior to delivery to the laboratory.
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1.7 LANE WIDTH
REDUCTION

- .1 The Causeway is sufficiently narrow in its traffic lanes. The Contractor's operations shall take this into account and all access shall be designed in such way as to minimize reduction of the roadway width. Reflective material, signage and lighting will be incorporated to indicate edges and narrowing if a lane reduction is necessary.

1.8 PEDESTRIANS
AND THE PUBLIC

- .1 Use security fence (modular) barricades of not less than 1.8 m in height to block off work area from public access.
- .2 Secure the work area in an approved manner.
- .3 Provide secure closures to all openings to prevent public access to the work areas at all times during construction.
- .4 The Contractor to provide proper traffic control on Causeway so that Causeway remains open to local traffic volume during execution of work. Reduce dust and noise generation, and execute work with minimum disturbance to the public and normal use of the work area.
- .5 Provide appropriate barriers, warning lights and signage within the transition area for traffic and pedestrian use before the work site.
- .6 Coordinate with Departmental Representative the work in areas of high traffic.

1.9 PUBLIC TRAFFIC
FLOW

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, or lanterns as required to perform transitions and complete the Work while protecting the workers and the public.

1.10 CONSTRUCTION &
STORAGE AREA

- .1 The limits of the Construction and Storage Area will be designated by the Departmental Representative prior to commencement of work unless otherwise shown on the Drawings.

1.11 PROTECTION OF
WORK & COOPERATION

- .1 Protect the work from damage by adverse climatic conditions.
- .2 The Contractor will maintain site control throughout the duration of the Contract and, shall also be responsible for the site during any temporary "shut down" periods.
- .3 Execute Work within regular hours Monday to Friday from 07:00 to 18:00 hours for all Work not affecting pedestrian or vehicular traffic. All Work which will affect pedestrian or vehicular traffic shall be executed from 22:00 to 06:00 hours. If required, permission will be given to work on Saturday, Sunday and statutory holidays.
- .4 Confine work, including temporary structures, equipment and materials to established limits of site.
- .5 Establish location, protect and maintain existing utility lines.

1.12 EXAMINATION

- .1 Visits scheduled during the tender period shall be as indicated in the instructions to tenderers. Confirmation of attendance is to be made through the Contracting Authority. No other visits will be scheduled by the Owner and, should the tenderer wish to visit the site at other times, it will be his responsibility to make arrangements.
- .2 Investigate and be fully informed as to the character and extent of the work to be performed and the difficulties involved, the facilities available for delivering, placing and handling of materials.

1.13 TIME OF
COMPLETION

- .1 Commence work in accordance with notification of acceptance of your offer and complete the work within the dates outlined in the contract.
 - .2 Comply with the work schedule restriction imposed by Department Representative.
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- 1.14 EXISTING UTILITIES
- .1 Establish Location, protect and maintain existing utility lines.
 - .2 There are high voltage electrical lines to the north of the bridge and high call volume communication cables to the south . Some of the cables exit the abutments and are located along the bottom of the channel. The communication lines are extremely significant and must be protected at all times.
 - .3 The wiring and cabling related to the operation of the bridge is to be protected and left untouched. Identify sensors, limit switches and wires within the work area that prevent completion of the work for review by the Departmental representative. Loosen and relocate any wiring as required only after approval by Departmental Representative to complete the work.
- 1.15 TAXES
- .1 Pay all taxes properly levied by law (including Federal, Provincial and Municipal).
- 1.16 PERMITS
- .1 Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Notify the Ministry of Labour of the work. Provide inspection certificates as evidence that work conforms with requirements of authority having jurisdiction.
- 1.17 WASHROOM FACILITIES
- .1 Existing washroom facilities on site will not be available for the Contractor's use.
 - .2 The Contractor shall supply and maintain an acceptable chemical toilet and locate as directed by the Departmental representative. The toilet shall be thoroughly clean and serviced once a week and shall be a minimum of 10 metres from the water.
 - .3 No waste or chemical will be allowed to stain or wet the ground or be washed by rain into the waterway. The Contractor will have a spill kit on site capable of preventing such occurrence.
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PART 2 - MATERIALS

- 2.1 RECTIFICATION OF EXISTING SURFACES AND MATERIALS
- .1 Repair, replace and/or refinish, to the Departmental Representative's approval, existing surfaces and items damaged by the work, including accesses and staging areas, walkways etc.
 - .2 The repaired, replaced and/or refinished items to be at least equal to those that existed immediately before damage occurred.
 - .3 Restore the gravelled, asphalted or concrete areas with "like" material and to the satisfaction of the Departmental Representative.
 - .4 Repair and restoration must occur as soon as possible after construction is completed.

PART 3 - EXECUTION

- 3.1 REQUIREMENTS OF REGULATORY AGENCIES
- .1 Be entirely responsible for the design and adequacy of all supports, bracings, blocking, handrails, anchors, etc. used in the construction, and comply with applicable Federal, Provincial and Municipal ordinances.
 - .2 Security fence posts to be self supported and self mounting and shall not be anchored by drilling into existing features or earth, nor shall existing loose rock or other site materials be used as counter balance material. Contractor shall obtain approval on "securing" measures for post stability prior to proceeding with work.
 - .3 Adhere to National, Provincial and Municipal requirements relating to the safety, health and protection of workers and the environment.
- 3.2 SCHEDULING
- .1 The Contract must be completed on or by the date specified in the instructions to tenderers portion of these documents.
 - .2 Submit bar chart Construction Progress Schedule within five days of award of Contract. No progress payments will be made

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- 3.2 SCHEDULING .2 (Cont'd)
(Cont'd)
- until the Construction Progress Schedule is approved. Upon receipt of notice from the Departmental Representative, in writing, that the Progress Schedule is not approved or no longer valid, submit a revised Construction Progress Schedule within five days.
- .3 Take all necessary measures to complete the work within the scheduled times approved by Departmental Representative.
- .4 Do not make changes to the approved schedule except with Departmental Representative's approval.
- 3.3 TEMPORARY SERVICES .1 The Contractor shall be allowed access to the power service at the Bridge Operators Building as approved by the Departmental Representative and within the capacity of the existing power supply. Verify available power details at job showing. Any power requirements in excess of that which may be provided by the Operator's building supply shall be provided for by the Contractor. Temporary sanitary services shall be provided by the Contractor. The Contractor shall make his own arrangements to obtain all water required to carry out the work.
- 3.4 TEMPORARY FACILITIES .1 Provide and maintain:
- .1 Suitable storage facilities, of types and at locations approved by the Departmental Representative.
- .2 All necessary enclosures, guards, guardrails, hoarding, barricades, warning signs and similar items.
- .3 Verify available staging areas at the job showing or as shown on the drawings.
- .4 Photograph staging and work areas prior to starting work and have Departmental Representative verify. Upon completion return work and staging areas to a condition which existed prior to starting work.
- 3.5 CLEANING .1 Clean and tidy the work area on a daily basis and permit no undue amounts of debris, trash, and/or garbage to accumulate.
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- 3.5 CLEANING
(Cont'd)
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative.
 - .3 Clear snow and ice from access to work area.
 - .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
 - .5 Final cleaning:
 - .1 At the completion of the work, remove all surplus materials, tools, rubbish and debris and dispose of them in an approved manner off the site property.
 - .2 Pressure wash clean and wash exterior walks, steps and structure surfaces within work area.
 - .3 Reinstate areas and walkways affected by Work to condition which existed prior to beginning of Work.

PART 4 - DOCUMENTS

- 4.1 SUBMITTALS .1 Refer to Section 01 33 00 - Submittal Procedures.
- 4.2 DOCUMENTS REQUIRED .1 Maintain at job site, one copy each of following.
 - .1 Contract and reviewed shop drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change orders.
 - .5 Other modifications.
 - .6 Copy of approved work schedule.
 - .7 Notice of Project issued by Ministry of Labour.
 - .8 Environmental protection report.
 - .9 Waste management plan.
 - .10 All items required to be maintained on site as per 01 35 30 Health and Safety Requirements.
- 4.3 ADDITIONAL DRAWINGS .1 Departmental Representative may furnish additional drawings to clarify work.
.2 Such drawings become part of Contract Documents.
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PART 5 - ENVIRONMENTAL CONSIDERATIONS

- 5.1 REFERENCES
- .1 Canadian Council of Ministers of Environment (CCME) Documentation.
 - .2 Canadian Environmental Protection Act, 1999 (CEPA 1999).
 - .3 National Fire Code of Canada, 2010.
 - .4 Transportation of Dangerous Goods Act (TDG Act), 1992 c. 34.
 - .5 Transportation of Dangerous Goods Regulations (TDG Regulations), T-19.01-SOR/2003-400.
 - .6 Ontario Regulation 153/04 amended by O. Reg. 511/09.
- 5.2 DEFINITIONS
- .1 Toxic: substance is considered toxic if it is listed on Toxic Substances List found in Schedule 1 of CEPA.
 - .2 List of Toxic Substances: found in Schedule 1 of CEPA, lists substances that have been assessed as toxic. Federal Government can make regulations with respect to a substance specified on List of Toxic Substances. Column II of this list identifies type of regulation applicable to each substance.
- 5.3 REQUIREMENTS
- .1 The following requirements from the Environmental Assessment shall apply:
 - .1 Pollution:
 - .1 Fuel spill absorbents, containment booms and fuel spill response kit must be on site and available for quick deployment. Any spill is to be reported immediately.
 - .2 All employees are to be briefed on what to do in the event of a spill so that a response can occur immediately.
 - .3 All hazardous material transport and storage rules are to be followed during the project.
 - .4 Chemical products identified as harmful or hazardous to aquatic life must not be stored within 30 metres of the shoreline.
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5.3 REQUIREMENTS .1
(Cont'd)

- (Cont'd)
- .1 Pollution:(Cont'd)
 - .5 Any hazardous material stored on-site will be secured against unauthorized access and vandalism with a suitable locking mechanism.
 - .6 On-site refueling of equipment, if necessary, is to be done in a manner that restricts the potential release of petroleum products into the environment or a watercourse.
 - .7 On-site burning or burying of waste materials is prohibited.
 - .8 All waste material is to be reused or disposed of at an approved landfill site.
 - .9 Contractor to maintain sanitary facilities and handle waste safely to prevent spillage.

5.4 DISPOSAL OF WASTE .1

- .1 When there are exceedances with respect to Ont. Reg. 511/09 Table 9 for hydrocarbons and metals, and the substances would require to be disposed of, the disposal must be into a licensed landfill or scrap yard. Acceptable landfill: Napanee.
- .2 Solvent, sealant, volatile materials, such as mineral spirits, oil, paint thinner, and concrete materials must not be disposed of into water course, sewer system, streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .3 All waste described as subject to Regulation 309, Environmental Act, must be transported with a valid "Certificate of Approval for a Waste Management System" to a site approved to accept the waste.
- .4 Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.
- .5 Complete records of all removals from site including:
 - .1 Time and date of removal.
 - .2 Description of material and quantities.
 - .3 Proof that materials have been received at an Approved Waste Processing Site (scrap yard) or certified Waste Disposal Site as required.

- 5.4 DISPOSAL OF WASTE
(Cont'd)
- .6 Government Chief Responsibility for the Environment: Ontario Ministry of Environment and Energy, 2 St Clair, Avenue West Toronto, ON M4V 1L5 Environment Canada Toronto, ON
.1 Telephone: 800-565-4923.
.2 Fax: 416-314-8452.
- .7 Kingston: Ministry of Environment and Energy
1259 Gardiners Road, K7M 8S5.
.1 Telephone: 613-549-4000.
.2 Fax: 613-548-6908.
- 5.5 DISRUPTION OF SITE
- .1 Minimize disruption of site and restore all damaged features to satisfaction of Departmental Representative.
- 5.6 FIRES
- .1 Fires and burning of rubbish or any material on site is not permitted.
- 5.7 ENVIRONMENTAL PROTECTION PLAN
- .1 Submit Site Specific Environmental Protection Plan within 7 days after date of Notice to Proceed and prior to commencement of work. Environmental Plan must include outline of how mitigating measures will be satisfied.

PART 6 - PROGRESS PAYMENTS

- 6.1 PROGRESS PAYMENTS
- .1 All items in this Contract are paid for on a Lump Sum basis. Prior to submission of the first progress payment claim, submit to Departmental Representative a detailed breakdown of these lump sum items in order to facilitate approval and processing of progress payment claims.
- .2 The detailed breakdown is to be in sufficient detail so as to permit the calculation of progress payment amounts.
.1 The final list will be subject to review by Departmental Representative.

PART 1 - GENERAL

- 1.1 ADMINISTRATIVE .1 This Section specifies general requirements and procedures for Contractor submissions of shop drawings, product data and samples to Departmental Representative for review. Additional specific requirements for submissions are also specified in other individual sections of these specifications.
- .2 Do not proceed with work until relevant submissions are reviewed by Departmental Representative.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units, converted values are acceptable.
- .5 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .6 Verify field measurements and affected adjacent work are co-ordinated.
- .7 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review of submissions, unless Departmental Representative gives written acceptance of specific deviations.
- .9 Make any and all changes in submissions which Departmental Representative may require consistent with Contract Documents and resubmit as directed by Departmental Representative.
- .10 Notify the Departmental Representative, in writing, when resubmitting any revisions other than those requested by the Departmental Representative.
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- 1.1 ADMINISTRATIVE (Cont'd) .11 Keep one reviewed copy of each submission on site.
- 1.2 SHOP DRAWINGS AND PRODUCT DATA .1 The term "shop drawing" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of portions of work, which are specific to project requirements.
- .2 Submit drawings stamped and signed by Professional Engineer registered or licensed in Province of Ontario, Canada.
- .3 Maximum sheet size: 850 X 1050 mm.
- .4 Submit shop drawings as follows:
.1 Electronic Format in PDF, JPEG or Word, transmitted on either a USB Stick, on CD/DVD disk, or by email.
- .5 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings, specifications and/or applicable portions of Contract Documents.
- .6 Allow five (5) working days for Departmental Representative's review of each submission.
- .7 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.
- .8 Co-ordinate, each submission, with requirements of work and Contract documents. Individual submissions will not be reviewed until all related and relevant information is available.
- .9 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When re-submitting, notify
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1.2 SHOP DRAWINGS .9
AND PRODUCT DATA
(Cont'd)

- (Cont'd)
Departmental Representative in writing of
revisions other than those requested.
- .10 Accompany submissions with transmittal
letter, containing:
- .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop
drawing, product data and sample.
 - .5 Other pertinent data.
- .11 Submissions shall include:
- .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by
Contractor's authorized representative
certifying approval of submissions,
verification of field measurements and
compliance with Contract Documents. Note:
submissions without a signed Contractor's
stamp will not be reviewed and will be
returned to the Contractor for re-submission
with the required signed stamp.
 - .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 Relationship to adjacent work.
- .12 After Departmental Representative's review,
distribute copies to appropriate parties.
- .13 Delete information not applicable to project.
- .14 Supplement standard information to provide
details applicable to project.
- .15 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 copies will be
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- 1.2 SHOP DRAWINGS AND PRODUCT DATA (Cont'd)
- .15 (Cont'd)
returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of work may proceed.
- .16 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for the sole purpose of ascertaining conformance with general concepts.
.1 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 requirements of construction and Contract Documents.
.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of work of sub-trades.
- .17 Submit shop drawings for the following work:
.1 Reinforcing steel.
.2 Formwork.
- 1.3 PRODUCT DATA
- .1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams used to illustrate standard manufactured products.
- .2 Submit product data in electronic PDF format.
- .3 Supplement standard information to provide details applicable to project.
- .4 Cross-reference product data information to applicable sections of Contract Documents.
- .5 Submit product data for the following items:
.1 Concrete mix.
.2 Anchor grout.
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- 1.4 CERTIFICATES AND TRANSCRIPTS .1 Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.
- .2 Submit transcription of insurance immediately after award of Contract.
- 1.5 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.

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 GENERAL
REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter O.1, as amended, Canada Labour Code Part II, and Canada Occupational Safety and Health Regulations.
- .2 Develop written Site-Specific Health and Safety Plan based on hazard assessment prior to commencing any site work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .3 Relief from or substitution for any portion or provision of minimum Health and Safety Guidelines specified herein or reviewed Site-Specific Health and Safety Plan shall be submitted to Departmental Representative in writing. Departmental Representative may respond in writing, either accepting or requesting improvements.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA):
 - .1 CSA S350-M1980 Code of Practice for Safety in Demolition of Structures.
 - .2 National Building Code 2005 (NBC):
 - .1 Division B, Part 8 Safety Measures at Construction and Demolition Sites.
 - .3 National Fire Code 2010 (NFC):
 - .1 NFC 2005, division B, Part 2 Emergency Planning, subsection 2.8.2 Fire Safety Plan.
 - .4 Province of Ontario:
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter O.1 as amended, O. Reg. 213/91 as amended, Reg. 834.
 - .2 Workplace Safety and Insurance Act, 1997
 - .3 Municipal statutes and authorities.
 - .5 Fire Commissioner of Canada (FCC):
 - .1 FC-301 Standard for Construction Operations, June 1982.
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- 1.2 REFERENCES (Cont'd)
- .5 Fire Commissioner of Canada (FCC):(Cont'd)
 - .3 (Cont'd)
 - .2 FC-302 Standard for Welding and Cutting, June 1982.
 - .6 Canada Labour Code Part II, and Canada Occupational Safety and Health Regulations.

Human Resources and Social Development Canada
Labour Program
Fire Protection Engineering Services
4900 Yonge Street 8th Floor
Willowdale, Ontario M2N 6A6

and copies may be obtained from:
Human Resources Development Canada Labour
Program Fire Protection Engineering Services
Ottawa, Ontario K1A 0J2
- 1.3 REGULATORY REQUIREMENTS
- .1 Comply with Acts and regulations of the Province of Ontario.
 - .2 Comply with specified standards and regulations to ensure safe operations at site.
 - .3 In event of conflict between any provisions of specified standards and regulations, the most stringent provision governs.
 - .4 Comply with requirements of FCC No. 301.
- 1.4 SUBMITTALS
- .1 Make submittals in accordance with Sections 01 01 00 and 01 33 00.
 - .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operations found in work plan.
 - .3 Measures and controls to be implemented to address identified safety hazards and risks.
 - .4 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
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1.4 SUBMITTALS
(Cont'd)

- .2 (Cont'd)
- .5 (Cont'd)
during emergency situations. Coordinate plan with existing Emergency Response requirements and procedures provided by Departmental Representative.
- .6 Company Health and Safety Policy.
- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and may 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 Site Specific Health and Safety Plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction site health and safety.
- .5 Submit names of personnel and alternates responsible for site safety and health.
- .6 Submit records of Contractor's Safety Meetings when requested.
- .7 Submit 3 copies of the Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative when requested.
- .8 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
- .9 Submit copies of near misses, incident and accident reports.
- .10 Submit Workplace Safety and Insurance Board (WSIB), Experience Rating Report for Province of Ontario.
- .11 Submit Material Safety Data Sheets for all products and items used on site(MSDS)to Departmental Representative.

- 1.5 FILING OF NOTICE .1 File Notice of Project with Provincial authorities prior to commencement of Work.
- 1.6 SAFETY ASSESSMENT.1 Perform site specific safety hazard assessment related to project.
- 1.7 WORK PERMIT .1 Obtain Hot Work Permit from Facilities/asset Management Department.
- 1.8 MEETINGS .1 Pre-construction meeting: schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of work.
- 1.9 WHMIS REQUIREMENTS .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada, and Health and Welfare Canada.
- .2 Deliver copies of WHMIS data sheets to Departmental Representative upon delivery of materials to the site.
- 1.10 PROJECT SITE CONDITIONS .1 Work at site may involve contact with the following potential hazards:
- .1 Silica/dust in Concrete.
 - .2 Working near and above open water or ice.
 - .3 Work near utilities.
 - .4 Adverse weather conditions.
 - .5 strong winds.
- 1.11 DESIGNATED SUBSTANCE REPORT .1 Designated substances are as defined by the Occupational Health and Safety Act Revised Statutes of Ontario, 1990, Chapter 0.1 as amended, in the work area.
- .2 Designated Substances Report (DSR) of the LaSalle Causeway will be provided to contractor prior to starting work. The
-

- 1.11 DESIGNATED
SUBSTANCE REPORT
(Cont'd) .2 (Cont'd)
contractor shall furnish this report to
subcontractors.
- 1.12 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, 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
Ontario Act (Occupational Health and Safety
Act).
- 1.13 COMMUNICATION
REQUIREMENTS .1 Comply with Ontario Health and Safety Act,
Canada Labour Code Part II, and Canada
Occupational Safety and Health Regulations.
- 1.14 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.
- 1.15 POSTING OF
DOCUMENTS .1 Ensure applicable items, articles, notices
and orders are posted in conspicuous location
on site in accordance with Acts and
Regulations of Province of Ontario, and in
consultation with Departmental Representative.
- .1 Contractor's Safety Policy.
.2 Constructor's Name.
.3 Notice of Projects.
-

- 1.15 POSTING OF DOCUMENTS
(Cont'd)
- .1 (Cont'd)
- .4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
 - .5 Ministry of Labour Orders and reports.
 - .6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
 - .7 Address and phone number of nearest Ministry of Labour office.
 - .8 Material Safety Data Sheets.
 - .9 Written emergency Response Plan.
 - .10 Site Specific Health and Safety Plan.
 - .11 Valid certificate of first aider on duty.
 - .12 WSIB "In Case of Injury At Work" poster.
 - .13 Location of toilet and cleanup facilities.
 - .14 Workplace Safety and Insurance Board (WSIB)for Ontario-Regulation 1101.
 - .15 Ministry of Labour Regulations for the Province of Ontario.
- .2 Comply with Provincial general posting requirements.
- 1.16 CORRECTION OF NON-COMPLIANCE
NON-COMPLIANCE
- .1 Immediately address health and safety non-compliance issues identified by Departmental Representative and regulatory agency having jurisdiction in the Province or any individual who notes a safety related issue.
- .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 a perceived non-compliance of health and safety regulations is perceived to not be immediately corrected.
- 1.17 WORK STOPPAGE
WORK STOPPAGE
- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it
-

1.17 WORK STOPPAGE .2 (Cont'd)
(Cont'd) is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

END

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This Section describes requirements for the protection of the environment that apply to the Work. These requirements apply to all Sections of this Specification, without limiting the conditions and approvals imposed by statute.
- .2 Control Work to provide effective environmental, waterbody, and fish habitat protection. Departmental Representative will monitor environmental protection measures and will identify whenever such protection is found to be ineffective. Change protective measures or work procedures as directed by the Departmental Representative to ensure environmental, waterbody and fish habitat protection.
- 1.2 DEFINITIONS .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.
- .3 "Deleterious Material" - any substance that, if added to a waterbody, could degrade water quality or impact fish, fish habitat and aquatic wildlife. This includes, but is not limited to:
- .1 Masonry and concrete dust.
 - .2 Soils (clay, silt, sand).
 - .3 Oil, diesel, or gasoline.
 - .4 Chipped or fresh mortar, concrete and admixtures.
-

1.2 DEFINITIONS
(Cont'd)

- .3 (Cont'd)
 - .5 Alkali water resulting from fresh mortar, concrete or cementitious grout.
 - .6 Salt.
 - .7 Solvents.
- .4 "Dripline" - means the location on the ground surface directly beneath a theoretical line described by the tips of the outermost branches of the trees.
- .5 "Barrier" - means fence consisting of approved material, supported by steel posts and being a minimum of 1.8m high, without breaks or unsupported sections.
- .6 "Designated Substances" - hazardous materials as defined and listed in Ontario Regulation 490/09.

1.3 MEASUREMENT
AND PAYMENT

- .1 There will be no measurement of Environmental Procedures.
- .2 Payment will be included in the Lump Sum Price.

1.4 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00.
 - .2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.
 - .3 Address topics at level of detail commensurate with environmental issue and required construction tasks.
 - .4 Environmental protection plan: include:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for training site personnel.
 - .3 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including
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1.4 SUBMITTALS
(Cont'd)

- .4 Environmental protection plan:(Cont'd)
- .3 (Cont'd)
monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .4 Drawings showing locations of proposed temporary excavations or embankments for haul roads, channel crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .5 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
- .6 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
- .7 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .8 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .9 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.
- .10 Contaminants prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .11 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water.
- .12 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying

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- 1.4 SUBMITTALS (Cont'd) .4 Environmental protection plan:(Cont'd)
.12 (Cont'd)
and protecting historical, archaeological,
cultural resources, biological resources and
wetlands.
- 1.5 FIRES .1 Fires and burning of rubbish on site are not
permitted.
- 1.6 DISPOSAL OF WASTES .1 Do not bury rubbish and waste materials on
site.
- 1.7 TURBIDITY CONTROL AND DRAINAGE .1 Provide erosion and sediment control plan
that identifies type and location of erosion
and sediment controls to be provided. Plan to
include but not limited to; monitoring and
reporting requirements to assure that control
measures are in compliance with erosion and
sediment control plan, Federal, Provincial,
and Municipal laws and regulations.
- .2 Obtain a "Permit to Take Water" from the
Ontario Ministry of the Environment if more
than 50,000 Litres of water per day is taken
from the waterway, or if the waterway is
restricted during construction.
- .3 Provide temporary drainage and pumping as
necessary to keep excavations and site free
from water.
- .4 Do not pump water containing suspended
materials into waterways, sewer or drainage
systems. Send all discharge to a settling pond
or filtration area before removal from site.
.1 If required upon site observations,
provide a marine grade turbidity curtain
across all areas where sediments can enter the
watercourse. Turbidity curtain to be anchored
or weighted down along its length to form a
continuous seal on the lake bed with adequate
flotation at water surface to prevent over
spills of turbid water.
.2 In the event of significant silting or
debris caused by construction activities,
contractor must take appropriate measures to
confine work and install additional turbidity
curtains.
-

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- 1.7 TURBIDITY CONTROL AND DRAINAGE (Cont'd)
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
 - .6 If the sediment, debris or erosion control measures are not functioning properly, no further work will be permitted until the sediment/erosion problem has been rectified
 - .7 Sediment, debris and erosion control measures shall be left in place until all disturbed areas within the work area has been stabilized and any sediments in the water have settled. Removal will be permitted only after written approval from the Departmental Representative.
- 1.8 WORK ADJACENT TO WATERWAYS
- .1 Do not operate construction equipment in waterways.
 - .2 Do not use waterway beds for borrow material.
 - .3 Do not dump excavated fill, waste material or debris in waterways.
 - .4 Do not use salt as a deicer near the river. In areas where ice is a safety concern, the use of sand will be permitted, but it must not be allowed to enter the watercourse.
 - .5 Stockpile excavated or fill materials must be stored and stabilized away from water. Runoff from the excavated or fill material must be contained from entering the watercourse.
- 1.9 POLLUTION CONTROL
- .1 Maintain temporary erosion and pollution control features installed under this contract.
 - .2 Spills of deleterious substances:
 - .1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.
 - .2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060.
 - .3 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be
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- 1.9 POLLUTION CONTROL
(Cont'd)
- .2 Spills of deleterious substances:(Cont'd)
- .3 (Cont'd)
obtained from the Transport Canada 24-hour number (613) 996-6666 collect.
- .4 Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal.
- .5 Be responsible for all costs of cleaning up any spills to the satisfaction of the Departmental Representative.
- .6 Have an environmental emergency response plan in place and a spill kit readily available.
- 1.10 SEDIMENT,DUST AND EROSION PROTECTION
- .1 Before starting work that will create dust or debris, (such as wood sawing, excavation, backfilling, etc.), install effective mitigation techniques for sediment, dust, debris and erosion control to the satisfaction of Departmental Representative. Maintain these protective measures at all times, including shut down periods.
- .2 Provide a 1 metre high silt fence barrier in all areas where, due to construction activities, silt or debris may enter the lake. Install silt curtain minimum 3 m from shoreline.
- .3 Maintain a standby supply of pre-fabricated silt fence barrier, or an equivalent ready-to-install sediment control device.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.
- 1.11 OPERATION AND MAINTENANCE OF EQUIPMENT
- .1 Provide drip trays to prevent the discharge oil, grease, antifreeze, or any other materials into the ground.
- .2 Equipment and heavy machinery used shall meet or exceed all applicable emission requirements.
- .3 Leave machinery running only while in actual use, except where extreme temperatures prohibit shutting machinery down.
- .4 Conduct all vehicle/equipment maintenance and refueling over impermeable/absorptive material
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- 1.11 OPERATION AND MAINTENANCE OF EQUIPMENT (Cont'd)
- .4 (Cont'd) situated at a designated site that is located at least 15 m away from the waterway and basin.
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- 1.12 CLEANING OF EQUIPMENT
- .1 Use trigger operated spray nozzles for water hoses.
- .2 Departmental Representative will designate a cleaning area for equipment and tools to limit water use and runoff. The cleaning area shall be sufficiently far away from the watercourse to prevent contamination. Where no safe cleaning area is available, Contractor shall be required to provide a settling pond where the equipment can be cleaned. All alkali water is to be disposed of in accordance with federal, provincial, and local authority requirements.
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- 1.13 REMOVED MATERIALS
- .1 Unless otherwise specified, materials designated for removal become the Contractor's property. Remove these from site.
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- 1.14 CLEAN UP
- .1 Clean up work area as work progresses. At the end of each work period, and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.
- .2 Permit no undue amounts of debris, trash or garbage to accumulate.
- .3 Separate and recycle all materials that can be recycled.
- .4 Dispose of hazardous materials and designated substances in accordance with Ontario Regulation 347/90.
- .5 Dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner by taking them to a special designated waste facility. Do not dump these into lake, storm or sanitary sewers.
-

- 1.14 CLEAN UP
(Cont'd)
- .6 Ensure all emptied containers are sealed and stored safely for disposal away from children and / or the Public.
 - .7 Remove all scaffolding, temporary protection, surplus materials, tools, plant, rubbish and debris and dispose of them in an approved manner off Crown property by the completion date of the Work.
 - .8 Clean areas under contract to a condition at least equal to that previously existing and to approval of Departmental Representative.
- 1.15 TRANSPORTING
WASTE MATERIALS
- .1 All waste subject to Regulation 347/90 of the Ontario Environmental Protection Act must be transported with a valid "Certificate of Approval for a Waste Management System" to a site approved by the Ontario Ministry of the Environment to accept that waste.
 - .2 Be responsible for obtaining all Waste Generator Numbers, permits, manifests, and all other paperwork necessary to comply.
- 1.16 NOISE CONTROL
- .1 Minimize the noise levels from construction activities by using proper muffling devices, in addition to appropriate timing and location of these activities to reduce or minimize the effect of noise on nearby residents, recreational users, and wildlife.
 - .2 Comply with any local or municipal Noise By-Laws.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END

PART 1 - GENERAL

- 1.1 INDEPENDENT INSPECTION AGENCIES .1 Departmental Representative will engage, as required, independent Inspection/Testing Agencies for purpose of Quality Assurance only, that is, verifying Contractor's Quality Control processes for concrete, environmental protection, waste disposal, etc.
- .2 Contractor is responsible for all Quality Control. Employment of inspection/testing agencies does not relax responsibility to perform work in accordance with Contract Documents.
- 1.2 ACCESS TO WORK .1 Allow Departmental Representative access to work whenever and wherever it is in progress. Provide equipment required for access and executing inspection and testing by appointed agencies such as (but not limited to) ladders, lights.
- .2 Co-operate to provide reasonable facilities for such access.
- 1.3 PROCEDURES .1 Notify Departmental Representative in advance of requirement for tests as specified in individual Sections of the tender package.
- .2 Submit samples and/or materials required for testing as listed 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.
- 1.4 TESTING BY DEPARTMENTAL REPRESENTATIVE .1 Departmental Representative will perform inspection/testing on a random basis for auditing purposes. Correct defect and irregularities as advised by Departmental Representative at no cost. Pay costs for retesting and reinspection.
-

- 1.4 TESTING BY DEPARTMENTAL REPRESENTATIVE (Cont'd)
- .2 If Contractor covers or permits to be covered work that has been designated for inspections before these are made, uncover such work, have inspections or tests satisfactorily completed and make good such work.
- .3 Departmental Representative will order part of work to be examined if work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such work and pay cost of examination and correction. If such work is found in accordance with Contract Documents, Departmental Representative will authorize payment of the cost of examination and replacement.
- 1.5 REJECTED WORK
- .1 Remove defective work whenever this is found, either through Contractor Quality Control procedures or through Departmental Representative's Quality Assurance. Replace or re-execute in accordance with Contract Documents.
- .2 If in opinion of Departmental Representative it is not expedient to correct defective work or work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.
-

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QUALITY ASSURANCE

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PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

————— END —————

PART 1 - GENERAL

- 1.1 SECTION INCLUDES .1 Temporary utilities.
- 1.2 INSTALLATION AND REMOVAL .1 Provide temporary utilities in order to execute Work expeditiously.
- .2 Remove from site all such Work after use.
- 1.3 TEMPORARY POWER AND LIGHT .1 Departmental Representative will provide for temporary power during construction for temporary lighting and operating of light power tools, to a maximum supply of 120 volts, and 20 amps. The Contractor shall provide a temporary sub panel and all wiring to accomodate the use of the power for construction purposes. The Contractor shall secure the building during construction and make good after construction.
- .2 Temporary power for other equipment requiring in excess of above, is responsibility of the Contractor.
- .3 Provide and maintain temporary lighting throughout project. Ensure level of illumination is not less than 162 lx. Work might be conducted during the night, so areas where Work will be conducted and areas to be inspected will require sufficient lighting to complete work and inspection.
- .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.
- 1.4 FIRE PROTECTION .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

————— END —————

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Construction aids.
 - .2 Office and sheds.
 - .3 Parking.
 - .4 Project identification.
- 1.2 REFERENCES
- .1 Canadian General Standards Board (CGSB)
 - .2 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-08, Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M87(R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment.
- 1.3 SUBMITTALS
- .1 Submittals in accordance with Section 01 33 00.
- 1.4 INSTALLATION AND REMOVAL
- .1 Prepare and provide prior to work, site plan indicating proposed location and dimensions of areas to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation including gate locations.
 - .2 Identify areas which have to be gravelled to prevent tracking of mud.
 - .3 Indicate use of supplemental or other staging area.
 - .4 Provide construction facilities in order to execute work expeditiously.
 - .5 Remove from site all such work after use.
-

- 1.5 SCAFFOLDING .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain scaffolding, ramps, ladders, platforms, temporary stairs.
- 1.6 HOISTING .1 Provide, operate and maintain hoists/cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
- .2 Hoists/cranes shall be operated by qualified operator.
- 1.7 SITE STORAGE/LOADING .1 Confine work and operations of employees to areas defined by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of work with a weight or force that will endanger the work.
- 1.8 CONSTRUCTION PARKING .1 Parking will be permitted on site provided it does not disrupt performance of work.
- .2 Provide and maintain adequate access to project site.
- .3 The Contractor is responsible for snow removal during period of Work within staging and construction areas.
- 1.9 SECURITY .1 Pay for suitable security measures and methods to guard site and contents of site after working hours and during holidays. To be submitted and approved by Departmental Representative.
- 1.10 SANITARY FACILITIES .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
-

1.11 PROTECTION
AND MAINTENANCE OF
TRAFFIC

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

1.12 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
 - .2 Clean dirt or mud tracked onto paved or surfaced roadways.
 - .3 Store materials resulting from demolition activities that are salvageable.
 - .4 Stack stored new or salvaged material.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used

————— END —————

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This section specifies requirements for designing, supplying, installing, inspecting, maintaining, and removing:
- .1 Cold weather protection, consisting of temporary housing and supplementary heating for the workspaces and the work, as described by the specifications. The requirements of this section apply to all sections of specifications that call for cold weather protection.
 - .2 Housing and containment systems.
 - .3 Lighting and ventilating workspaces.
- .2 Work not included in this Section:
- .1 Provision of separate air supply for workers which is part of Contractor's responsibility under Health & Safety regulations for construction.
- .3 Intent: housing, heating and ventilating must be sufficient to:
- .1 ensure safe working environment.
 - .2 facilitate progress of work in an efficient manner.
 - .3 protect areas adjacent to work during procedures which may damage surrounding areas.
 - .4 protect work and products against dampness and cold.
 - .5 provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- 1.2 MEASUREMENT AND PAYMENT .1 There will be no measurement of Temporary Barriers and Enclosures.
- .2 Payment will be included in the Lump Sum Price.
- 1.3 RELATED SECTIONS .1 Section 01 35 29 - Health and Safety Requirements.
- .2 Section 01 35 43 - Environmental Procedures.
- .3 Section 01 51 00 - Temporary Utilities
- .4 Section 01 52 00 - Construction Facilities.
-

- 1.4 REFERENCES
- .1 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-S269.2-M1987 (R2003), Access Scaffolding for Construction Purposes.
 - .2 Canadian Standards Association (CSA):
 - .1 CSA-O121-08, Douglas Fir Plywood.
 - .3 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990 as amended, O. Reg. 213/91 as amended.
 - .2 Air Pollution - Local Air Quality (O. Reg. 419/05)

- 1.5 SUBMITTALS
- .1 Shop drawings showing: (when applicable to cold weather Work)
 - .1 Type and construction of housing and enclosures, connections with scaffolding, stability system and method of sealing.
 - .2 Ventilation fan location and capacity.
 - .3 Heater numbers, types, locations, and capacities. Size of drip trays provided with all liquid-fueled heaters.
 - .4 Number and location of fire extinguishers associated with heating equipment.
 - .5 Number, type, strength, of all lighting provided within enclosure.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Subject to approval by Departmental Representative as to type, materials and detail. Use:
 - .1 New materials;
 - .2 Salvaged/recycled materials in good condition; or,
 - .3 Prefabricated portable components in a good, safe condition.
 - .2 Heating fuels:
 - .1 Use electricity, gas, diesel oil or other fuels approved by the Departmental Representative.

PART 3 - EXECUTION

- 3.1 GENERAL .1 Carry out all Work to:
- .1 Ontario Occupational Health and Safety Act and Regulations.
 - .2 Approved Site-Specific Health and Safety Plan.
 - .3 Approved Site-Specific Environmental Protection Plan.
- 3.2 SCAFFOLDING, HOARDING AND BARRIERS .1 Provide all scaffolding, ladders, access, lifting equipment, etc., as necessary, to carry out the work of all trades and as per the requirements of the Work.
- .2 Scaffolding shall be erected on wood sills.
 - .3 Make all changes to scaffolding required by Ministry of Labour officials.
 - .4 Install, maintain all barriers around the site to prevent access by the public to the immediate work areas. All barriers to be in accordance with the Occupational Health and Safety Act. Provide hoarding and other measures to protect the public. Remove all barriers accordingly at the completion of the work and or as indicated by the Departmental Representative.
- 3.3 HOUSING AND CONTAINMENT .1 Provide strong and durable enclosures and containment for portions of Work to be protected, heated, and/or ventilated during Work.
- .1 Enclosure to be strong enough to withstand rain, wind and snow loads.
 - .2 Enclosure to be insulated against cold.
 - .3 Electrical wiring, lights, and other equipment located inside enclosure: explosion-proof type. Illumination shall be sufficient for safe execution of the work.
- 3.4 HEATING .1 Provide temporary heating required during construction period, including watch keeping attendance, maintenance, and fuel.
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- 3.4 HEATING
(Cont'd)
- .2 Be responsible for damage to work due to failure in providing adequate heat and protection during construction.
 - .3 Fire protection requirements: to Section 01 35 29 - Health and Safety Requirements.
 - .4 Use only heating equipment types acceptable to Departmental Representative.
 - .5 Fuel Storage: to requirements of Fire Commissioner of Canada and Section 01 35 43 - Environmental Protection.
 - .6 Vent exhausts of heating equipment outside of housing, well clear of combustible materials and fresh air intake.
- 3.5 VENTILATING
EQUIPMENT
- .1 Intent of ventilation:
 - .1 To ensure required air temperature and quality in all parts of enclosure.
 - .2 To enhance Health and Safety of workers.
 - .2 Ventilate storage spaces containing hazardous or volatile materials.
- 3.6 FIELD QUALITY
CONTROL & WATCH
KEEPING
- .1 Provide and post at approved locations within enclosure, one maximum/minimum thermometer per approximately ten (10) square metres of plan area of enclosure.
 - .2 Ensure continuity of protection by providing a watch keeper to make periodic checks at all times when work is not in progress.
 - .3 Watch keeper's qualifications, under this section of specification, are to be sufficient to perform such duties as:
 - .1 Maintain strict supervision of operation of temporary heating and ventilating equipment.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Undertake preventive maintenance and re-fueling.
 - .5 Complete emergency repairs of minor complexity.
-

- 3.6 FIELD QUALITY .3 (Cont'd)
CONTROL & WATCH .6 Place standby items in service.
KEEPING
(Cont'd) .4 Record maximum and minimum temperature at
each thermometer on a daily basis, and
re-setting thermometers as necessary.
.1 Make temperature records available to
Departmental Representative on a daily basis.
.2 Provide certified written records to
Departmental Representative on a weekly basis.

END

PART 1 - GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 02 41 23 - Selective Demolition.
 - .2 Section 03 30 00 - Cast-In-Place Concrete.
- 1.2 REFERENCES
- .1 Ontario Traffic Manual, Book 7, March 2001 - Temporary Conditions (OTM Book 7).
- 1.3 MAINTENANCE OF TRAFFIC
- .1 There are several distinct phases of traffic protection and control. These phases will have to be repeated several times to complete the Project while maintaining unrestricted traffic access during working hours.
 - .2 There is no provision for limited short term closures during the day. The advantage to the Owner will be assessed before granting permission for short term closures but, it is not anticipated that they will be granted.
 - .1 If required and granted, methods for night time closures can be approved. Time duration of closures not to exceed 15 minutes which allow emergency vehicles access without delay and regular vehicles access with short delays (15 minutes) preferably.
 - .3 Two lanes of traffic must be available, one in each direction, from 6:00 to 21:00 everyday.
 - .4 Every effort shall be made to minimize the work requiring any night time closures as to cause the least amount of disruption to traffic.
- 1.4 PROTECTION OF PUBLIC TRAFFIC
- .1 Comply with requirements of Acts, Regulations and By-Laws in force for the regulation of traffic or use of roadways upon or over which it is necessary to carry out work or haul materials or equipment.
 - .2 Place equipment in positions to present minimum of interference and hazard to travelling public and where appropriate to protect workers.
-

1.4 PROTECTION OF
PUBLIC TRAFFIC
(Cont'd)

- .3 Keep equipment units as close together as working conditions permit and on same side of travelled way.
- .4 When Approved by Departmental representative and before re-routing pedestrian or vehicular traffic, erect suitable signs, barrier and devices in accordance to instructions in the Ontario Traffic Manual.
- .5 Provide and maintain suitable means of public access under Contract.
- .6 Provide and maintain roadway access under Contract.

1.5 INFORMATIONAL
AND WARNING
DEVICES

- .1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from project Work which requires road user response.
 - .1 Delivery, removal and transportation of materials and equipment.
 - .2 Movement on site of Workers and immediate site access.
- .2 Supply, erect and place signs, delineators, barriers and miscellaneous devices as specified on the OTM book 7, and/or as called for on the Contract drawings or designated by the Departmental Representative.
- .3 Advance construction warning signs are not shown on the drawings but are required in accordance with the requirements of OTM Book 7.
- .4 During all phases of the project, provide, apply and maintain reflective markings to delineate lanes, railing and barriers to increase visibility at night through out the construction site.
- .5 Submit to Departmental Representative a list of signs and other devices required for the project prior to commencement of work. If On Site conditions change, revise list for submission and approval of Departmental representative.

1.5 INFORMATIONAL .6
AND WARNING
DEVICES
(Cont'd)

Continually maintain traffic control devices in use by:
.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance and maintain signage diary.
.2 Remove or cover signs which do not apply to current existing conditions and as short duration activities demand. Reinstate signs as soon as they do apply and provide temporary flagpersons during any transitional periods.

1.6 CONTROL PUBLIC .1
TRAFFIC

Provide flag persons, trained in accordance with, and properly equipped as specified in, OTM book 7 in the following situations:
.1 When public traffic is required to pass working vehicles or equipment which block all or part of the traveled roadway.
.2 When it is necessary to institute one way traffic (i.e. during concrete delivery) through the construction area or other blockages when traffic signal system is not yet in use and as traffic system is being placed out of service.
.3 When workmen or equipment are employed on travelled way over brow of hill, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning. This situation is more likely east of the bridge and at the corner turning on to Ontario Street.
.4 Where temporary protection is required while other traffic control devices are being erected or taken down, not readily available for use or during maintenance of said devices.
.5 In situations where complete protection for workmen, working equipment and public traffic is not provided by other traffic control devices.
.6 No other closures than the various types of closures listed will be permitted unless a special written order or permit is issued by the Departmental Representative and has not been revoked or expired. Issuance of such permit will be unlikely unless no other option exists.

.2 The pedestrian walkway may not be accessible to the public throughout the project duration, develop an alternative solution and submit it

1.6 CONTROL PUBLIC .2
TRAFFIC
(Cont'd)

(Cont'd)
with the traffic control plan for review and approval to the Departmental Representative.
.1 The Contractor will be allowed to block one lane temporarily with flagmen, as required to escort pedestrian over the bridge.

1.7 OPERATIONAL .1
REQUIREMENT

Provide specified traffic control and warning devices before altering existing traffic conditions. Maintain the signage throughout the period of the Contract. Restore the original traffic configuration immediately after the work on the bridge is completed. Maintain two lanes of traffic during daylight hours and a minimum of one lane of traffic and full pedestrian access at all times via alternative methods other than the walkway.

.2 Installation of all traffic Control devices shall be completed during the designated night time work period.

.3 All emergency services must be notified of any changes to lane configurations and traffic setups a minimum of 24 hours in advance. Maintaining scheduling information will be critical to providing notice to emergency services. Keep PWGSC and the Departmental Representative informed of changes.

.4 In order to allow time to notify emergency services and to advertise the closures if required, the Contractor must submit a written request and get acceptance from the Departmental Representative a minimum of two (2) weeks prior to the night of closure. The written submission shall state the date, time and anticipated duration of the closure and the Contractor shall confirm that no events are occurring at the adjacent K-Rock center or Major event involving large groups of people at RMC.

.5 If emergency services are not notified sufficiently in advance (24 hours for changes to the traffic configuration or two weeks for closures) the changes or closures can not be made and two lane traffic must be restored. The Contractor can not claim for delay if the emergency services are not given sufficient notice or advertisements are not issued or completed.

1.7 OPERATIONAL
REQUIREMENT
(Cont'd)

- .6 Kingston has a fully operational 911 service. PWGSC will provide pre-warning of the project to emergency services and provide communication numbers and contacts. After receiving permission from Departmental Representative, the Contractor shall be Responsible for notifying emergency services, PWGSC and Departmental Representative.
- .7 Submit and provide a complete traffic control Plan showing all methodology in order for deployment, duration and use for all traffic devices and the work that will be completed. This is to include plans for the various traffic configurations that potentially will be encountered On Site.
- .8 Demonstrate the presence of all necessary material and equipment On Site to the Departmental Representative a minimum of 24 hours before any closure and initial traffic plan set up. If an operation involving a closure is cancelled or not completed due to reduced production of a piece of equipment or equipment failure, the Contractor must provide two full independent sets of required equipment with equal or greater capacity on site before the closure will be granted.

PART 2 - PRODUCTS

2.1 Not used

PART 3 - EXECUTION

3.1 Not Used

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This section specifies the requirements for demolition to complete work as indicated by the drawings and specification.
- .2 Work includes but is not limited to:
- .1 Concrete demolition and excavation. This includes but is not limited to the following:
 - .1 Demolition and removal of existing concrete retaining wall as shown on the drawings.
 - .2 Demolition and removal of existing concrete capped stone masonry pier as shown on the drawings.
 - .3 Excavation and removal of existing concrete from the face of southeast and southwest abutments as shown on the drawings.
 - .4 Excavation and removal of existing wharf concrete cap as shown on the drawings.
 - .5 Included under this work is saw cutting and mechanical chipping required to do the Work.
 - .6 Preparation of all concrete surfaces against which new concrete is to be cast.
 - .7 Disposing off site all concrete debris, removed steel reinforcement and all garbage generated during work.
- 1.2 RELATED SECTIONS .1 Section 03 30 00 - Cast in place concrete.
- 1.3 REFERENCES .1 Canadian Standards Association (CSA International).
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- .2 National Building Code of Canada (NBCC), including User's Guide, Part 8 - Safety Measures at Construction and Demolition Sites (2005).
- .3 Ontario Occupational Health and Safety Act (OSHA).
- .4 Ontario Building Code (OBC).
-

- 1.3 REFERENCES
(Cont'd)
- .5 Department of Justice Canada (Jus).
.1 Canadian Environmental Assessment Act (CEAA), 1992, c. 37.
.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
.1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- 1.4 MEASUREMENT AND PAYMENT
- .1 There will be no measurement of Selective Demolition.
- .2 Payment will be included in the Lump Sum Price.
- .3 No payment will be made for concrete excavation or demolition beyond the limits shown on the drawings, which has not been authorized by the Departmental Representative. Any overbreak beyond these limits shall be replaced with concrete at the Contractor's expense.
- 1.5 QUALITY ASSURANCE
- .1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial/Territorial regulations.
- 1.6 SITE CONDITIONS
- .1 Site Environmental Requirements.
.1 Perform work in accordance with Section 01 35 43.
- .2 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .3 Review existing site conditions and take necessary precautions to protect environment and adjacent non-work areas.
-

- 1.7 SCHEDULING .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
.1 Notify Departmental Representative in writing when unforeseen delays occur.

PART 2 - PRODUCTS

- 2.1 EQUIPMENT .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

PART 3 - EXECUTION

- 3.1 PREPARATION .1 Keep noise, dust, and inconveniences to nearby occupants to a minimum.
.2 Provide temporary dust screens, covers, railings, supports and other protection as required.

- 3.2 DEMOLITION .1 Demolish components of structure as shown on drawings and specified in specifications.
.2 Crush concrete generated due to demolition of the existing retaining wall to size suitable for recycling.
.1 For further information regarding acceptable uses contact Provincial/Territorial aggregate producers associations and or Ministries of Transportation.

- 3.3 SAFETY CODE .1 Do demolition work in accordance with Section 01 56 00.

- 3.4 CONCRETE EXCAVATION .1 Saw cut to lines and depths indicated on drawings.
.2 Remove existing concrete by hand-held jackhammers (chipping hammers) to minimum depths indicated on the drawings or as directed by the Departmental Representative. Excavation exceeding the limits indicated on

-
- 3.4 CONCRETE EXCAVATION
(Cont'd)
- .2 (Cont'd)
the drawings will only be paid if authorized by the Departmental Representative in writing.
- .1 Take special care not to damage the layer of concrete beyond depth of excavation by using jackhammers of appropriate weights (maximum 10 kg).
- .2 Contractor must maintain jackhammer chipping bits sharp, so as to minimize micro-cracking in the concrete layer behind the area of excavation.
- .3 Dispose the excavated material in an approved manner off PWGSC property.
- 3.5 PREPARATION OF CONCRETE SURFACES
CONCRETE SURFACES
- .1 Use a stiff broom to remove loose concrete from excavated surfaces, and a high pressure water jet to clean the surfaces after the excavation has been completed.
- .2 Keep the surfaces clean until new concrete is cast.
- .3 Do not exceed 1000 kPa water jet pressure.
- .4 Do not discharge the water from cleaning directly to the water course. Direct the water to a settling pond, or filter before releasing to the water course. See Section 01 35 43.
- 3.6 PROTECTION
PROTECTION
- .1 Support affected structures and, if safety of structure being demolished or remaining component of structure appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.
- 3.7 REMOVAL FROM SITE
REMOVAL FROM SITE
- .1 Transport material designated for disposal using approved facilities and in accordance with applicable regulations.
- 3.8 RESTORATION
RESTORATION
- .1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of Work.
-

3.9 CLEANING .1 Remove debris, trim surfaces and leave work
site clean, upon completion of Work

END

PART 1 - GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 03 20 00 - CONCRETE REINFORCING.
 - .2 Section 03 30 00 - CAST-IN-PLACE CONCRETE
- 1.2 MEASUREMENT PROCEDURES
- .1 There will be no measurement of Concrete Forming and Accessories.
 - .2 Payment will be included in the Lump Sum Price.
- 1.3 REFERENCES
- .1 Canadian Standards Association (CSA)
 - .1 CSA-A23.1-09/A23.2-09, Concrete materials and methods of concrete construction/Test methods and standard practices for concrete.
 - .2 CAN/CSA-086.1-01(R2006), Engineering Design in Wood (Limit States Design).
 - .3 CAN/CSA-086.1S1-05, Supplement No. 1 to CAN/CSA-086-01, Engineering Design in Wood (Limit States Design).
 - .4 CSA O121-08, Douglas Fir Plywood.
 - .5 CSA O151-09, Canadian Softwood Plywood.
 - .6 CSA O153-M1980(R2008), Poplar Plywood.
 - .7 CSA S269.1-1975(R2003), Falsework for Construction Purposes.
 - .8 CAN/CSA-S269.3-M92(R2008), Concrete Formwork.
 - .2 Council of Forest Industries of British Columbia (COFI)
 - .1 COFI Exterior Plywood for Concrete Formwork.
- 1.4 DESIGN REQUIREMENTS
- .1 Design formwork in accordance with CSA S269.1, S269.2-M and S.269.3-M and CSA A23.1 Clause 6.4. Formwork to provide specified finishes.
 - .2 Design formwork and falsework to carry dead loads and construction live loads.
 - .3 When high range water reducer (superplasticizer) is used in concrete mix, design forms for full hydrostatic pressure.
-

1.4 DESIGN
REQUIREMENTS
(Cont'd)

.4 make joints in forms watertight.

1.5 SHOP DRAWINGS

.1 Submit shop drawings for formwork and falsework in accordance with Section 01 33 00.

.2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings. Comply with CAN/CSA-S269.3 for formwork drawings.

.3 Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.

.4 Indicate sequence of erection and removal of formwork/falsework to minimize exposure time to adverse weather conditions.

.5 Each shop drawing submission shall bear stamp and signature of qualified professional engineer registered or licensed in Province of Ontario, Canada.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Formwork materials:
.1 For concrete without special architectural features, use wood and wood product formwork materials to CAN/CSA-086.1 CSA-0153.

.2 Form ties: use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.

.3 Form release agent: non-toxic, biodegradable, low VOC.

.4 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 15 to

2.1 MATERIALS
(Cont'd)

- .4 Form stripping agent:(Cont'd)
24 mm²/s at 40°C, flashpoint minimum 150°C,
open cup.

PART 3 - EXECUTION

3.1 FABRICATION
AND ERECTION

- .1 Verify lines, levels and centres before
proceeding with formwork and ensure dimensions
agree with drawings.
- .2 Fabricate and erect formwork in accordance
with CAN/CSA-S269.3 to produce finished
concrete conforming to shape, dimensions,
locations and levels indicated within
tolerances required by CSA-A23.1/A23.2.
- .3 Align form joints and make watertight. Keep
form joints to minimum.
- .4 Use 25 mm chamfer strips on external corners,
unless specified otherwise.
- .5 Form chases, slots, openings, drips,
recesses, expansion and control joints as
indicated.
- .6 Build in anchors, sleeves, and other inserts
required to accommodate Work specified in
other sections. Assure that all anchors and
inserts will not protrude beyond surfaces
designated to receive applied finishes.
- .7 Clean formwork in accordance with CSA-A23.1/
A23.2, before placing concrete.

3.2 FORM RELEASE
AGENT

- .1 Protect adjacent surfaces not designated to
receive concrete form release.
- .2 Clean and prepare surfaces to receive form
release in accordance with manufacturer's
instructions.
- .3 Remove all rust, scale and/or previously used
form release agents from the forms in
accordance with good concrete practices.
- .4 When using new wooden forms, form release
shall be applied and re-applied until complete
saturation has been accomplished prior to
first use.

3.3 REMOVAL AND
RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 1 day for footings
 - .2 3 days for walls.
- .2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.
- .3 Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .4 Space reshoring in each principal direction at not more than 2000 mm apart.
- .5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This section specifies the requirements for concrete reinforcement as described by the drawings and the specification.
- 1.2 RELATED SECTIONS .1 Section 03 10 00 - Concrete forming and Accessories.
.2 Section 03 30 00 - Cast-in-Place Concrete.
.3 Section 01 33 00 - Submittal Procedures.
- 1.3 MEASUREMENT AND PAYMENT .1 There will be no measurement of Concrete Reinforcing.
.2 Payment will be included in the Lump Sum Price.
- 1.4 REFERENCES .1 ASTM International
.1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
.2 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
.2 CSA International
.1 CSA A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
.2 CSA-A23.3-04 (R2010), Design of Concrete Structures.
.3 CSA G30.3-M1983(R1998), Cold Drawn Steel wire for Concrete Reinforcement.
.4 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
.5 CSA-G40.20-04(R2009)/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.6 CSA W186-M1990(R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.
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- 1.4 REFERENCES .3 Reinforcing Steel Institute of Canada (RSIC)
(Cont'd) .1 RSIC-2013, Reinforcing Steel Manual of
Standard Practice.
- 1.5 SUBMITTALS .1 Submit in accordance with Section 01 33 00.
- .2 Prepare reinforcement drawings in accordance
with RSIC Manual of Standard Practice.
- .3 Shop Drawings:
.1 Submit drawings stamped and signed by
professional engineer registered or licensed
in Province of Ontario, Canada. Indicate
placing of reinforcement and:
.1 Bar bending details.
.2 Lists.
.3 Quantities of reinforcement.
.4 Sizes, spacings, locations of
reinforcement and mechanical splices if
approved by Departmental Representative,
with identifying code marks to permit
correct placement without reference to
structural drawings.
.5 Indicate sizes, spacings and
locations of chairs, spacers and hangers.
.2 Detail lap lengths and bar development
lengths to CSA-A23.3, unless otherwise
indicated.
.1 Provide type B tension lap splices
unless otherwise indicated.
- 1.6 DELIVERY, .1 Deliver, store and handle materials in
STORAGE AND accordance with manufacturer's written
HANDLING 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 in dry
location and in accordance with manufacturer's
recommendations in clean and dry area.
.2 Replace defective or damaged materials
with new.
-

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
- .4 Chairs, bolsters, bar supports, spacers: to CSA A23.1/A23.2.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Ontario, Canada.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

PART 3 - EXECUTION

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.2 PLACING
REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA A23.1/A23.2.
- .2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .3 Minimum cover for reinforcement: 75 mm unless indicated otherwise.
- .4 Ensure cover to reinforcement is maintained during concrete pour.

END

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This section specified the requirements for cast-in-place concrete placed as described by the drawings and the specifications.
- 1.2 RELATED SECTIONS .1 Section 03 10 00 - Concrete Forming and Accessories.
.2 Section 03 20 00 - Concrete Reinforcing.
- 1.3 MEASUREMENT AND PAYMENT PROCEDURES .1 There will be no measurement of Cast-In-Place Concrete.
.2 Payment will be included in the Lump Sum Price.
- 1.4 REFERENCES .1 Reference Standards:
.1 ASTM International
.1 ASTM C260-/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
.2 ASTM C309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
.3 ASTM C494/C494M-13, Standard Specification for Chemical Admixtures for Concrete.
.4 ASTM C1017/C1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
.5 ASTM D1751-04(2008), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
.6 ASTM D1752-04a(2008), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
.2 CSA International
.1 CSA A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
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- 1.4 REFERENCES .1 (Cont'd)
- (Cont'd) .2 (Cont'd)
- .2 CSA A283-06 (R2011), Qualification Code for Concrete Testing Laboratories.
 - .3 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .4 CAN/CSA-A3001-08, Cementitious Materials for Use in Concrete.
- 1.5 SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00.
- .2 At least two (2) weeks prior to beginning work, submit to Departmental Representative concrete mix design and product data of the following materials proposed for use: aggregate source, curing compound, joint filler, joint sealant.
 - .3 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken.
- 1.6 QUALITY ASSURANCE .1 Provide Departmental Representative, minimum two (2) weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.
- .1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.
 - .2 Minimum two (2) weeks prior to starting concrete work, provide proposed quality control procedures for review by Departmental Representative on following items:
 - .1 Hot weather concrete.
 - .2 Cold weather concrete.
 - .3 Curing.
 - .4 Finishes.
 - .5 Formwork removal.
 - .6 Joints.
 - .3 Ensure that the mix design is adjusted suitably to prevent alkali aggregate reactivity problems.
-

1.7 DELIVERY,
STORAGE AND
HANDLING

- .1 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
- .2 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 90 minutes for concrete to be delivered to site of Work and discharged after batching.
- .3 Modifications to maximum time limit must be agreed by the Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

PART 2 - PRODUCTS

2.1 APPROVALS

- .1 All materials to be new and approved by the Departmental Representative.
- .2 Concrete mix to be approved by the Departmental Representative.

2.2 DESIGN CRITERIA

- .1 To CSA A23.1/A23.2, and as described in CONCRETE MIX of PART 2 - PRODUCTS.

2.3 MATERIALS

- .1 General:
 - .1 Do not use calcium chloride or compounds, or admixtures containing calcium chloride.
 - .2 Use consistent concrete ingredients, uniformly proportioned from batch to batch.
- .2 Cement: to CAN/CSA-A3001, Normal Type GU.
- .3 Supplementary cementing materials: with 20% to 30% hydraulic slag, by mass of total cementitious materials to CAN/CSA-A3001.
- .4 Cementitious hydraulic slag: to CAN/CSA-A3000-08.
- .5 Water: to CSA A23.1/A23.2.
- .6 Aggregates: to CSA A23.1/A23.2. All aggregate sources as listed on the MTO's Designated Source Materials (DSM) list.

2.3 MATERIALS
(Cont'd)

- .7 Admixtures:
 - .1 Air entraining admixture: to ASTM C260.
 - .2 Chemical admixture: to ASTM C494/C494M.
Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.
 - .3 Superplasticizers: to ASTM C1017.
- .8 Curing compound: to CSA A23.1/A23.2 white.
- .9 Premoulded joint fillers:
 - .1 ASTM D175-05 (2011) - Standard Specification for preformed Closed Cell polyolefin Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .10 Joint Sealer: to Can/CGSB-19.12 Sealing Compound, Two part component, elastomeric, chemical curing. Type I for Horizontal joints, Type II for vertical joints.
- .11 Bonding agent: To ASTM C1059/C1059M-99 (2008).
- .12 Polyethylene foam: use as a bond breaker between joint filler and sealer as shown on drawings.

2.4 CONCRETE MIX

- .1 Proportion concrete mix in accordance with CSA A23.1/A23.2 to meet following requirements - All classes of concrete:
 - .1 Cement: Mix of Type GU Portland cement and a cementitious hydraulic slag cement ranging between 20% and 30%.
 - .2 Minimum compressive strength at 28 days: 35 MPa.
 - .3 Maximum water/cementing materials ratio: 0.40.
 - .4 Class of exposure: F-1.
 - .5 Nominal size of coarse aggregate: 20 mm.
 - .6 Slump at time and point of discharge: 50 to 110 mm.
 - .7 Air content: 5 to 8%.
 - .8 Admixtures, water reducing agents: quantity to manufacturer's recommendation.
 - .1 Do not use calcium chloride or materials containing calcium chloride.
 - .9 Concrete supplier's certification: both batch plant and materials meet CSA A23.1/A23.2 requirements.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Obtain Departmental Representative's written approval before placing concrete.
 - .1 Provide 48 hours minimum notice prior to placing of concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00. Ensure that reinforcing steel, and other necessary items are in-place, clean and undamaged.
- .3 Use proper and timely placing, finishing and curing practices.
- .4 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.
- .5 Pumping of concrete is permitted only after approval of equipment and mix.
- .6 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .7 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .8 Protect previous work from staining.
- .9 Clean and remove stains prior to application for concrete finishes.
- .10 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .11 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 INSTALLATION/
APPLICATION

- .1 Do cast-in-place concrete Work in accordance to CSA A23.1/A23.2.
-

3.2 INSTALLATION/
APPLICATION
(Cont'd)

- .2 Place concrete continuously from start to finish:
 - .1 At such rates as to permit satisfactory placing and compaction - plan the work and use such methods and performance rates as to allow no cold joints and/or honeycomb;
 - .2 During clement weather or with protection;
 - .3 During daylight hours;
 - .4 Without unscheduled construction joints.

- .3 When applicable - pumping concrete:
 - .1 Arrange equipment so that no vibrations result which might damage freshly placed concrete. Use reversible pumps.
 - .2 Operate pump so that a continuous stream of concrete without air pockets is produced.
 - .3 When pumping is discontinued and concrete remaining in pipe line is to be used, void pipe line in a manner that prevents contamination of concrete or separation of ingredients.

- .4 Do not commence placing concrete until the Departmental Representative has inspected and approved forms, reinforcing steel, conveying, spreading consolidation and finishing equipment, and curing and protective methods.

- .5 Joint fillers:
 - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Departmental Representative. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
 - .2 Locate and form construction and expansion joints as indicated. Install joint filler, bond breaker and sealer.

- .6 Joint Sealant:
 - .1 Install to manufacturer's recommendations.

- .7 Finishing and curing:
 - .1 Finish concrete in accordance with CAN/CSA-A23.1/A23.2.
 - .2 Unformed surface concrete tolerance to conventional classification in accordance with straight edge method.
 - .3 Use wood float finish for unformed surfaces.

-
- 3.2 INSTALLATION/
APPLICATION (Cont'd) .7 Finishing and curing:(Cont'd)
.4 Fill all holes due to formwork
installation with concrete and smooth with
steel trowel.
- 3.3 CURING .1 If formwork is left in place for 7 days or
more, no additional curing will be required.
If formwork is removed in less than 7 days,
cure with double-layer of wet burlap. Maintain
burlap in place and keep thoroughly wet for 7
days after day of placing.
- .2 Unformed surfaces: cure with burlap and
water. Carefully place two layers of damp
burlap on the surface of the concrete. Overlap
each strip by at least 75 mm and secure
against displacement by wind. Maintain burlap
in place and keep thoroughly wet for 7 days
after day of placing.
- .3 During curing period uncover only such areas
that are immediately needed for finish
treatment. Recover and continue curing.
- 3.4 COLD WEATHER
PROTECTION .1 For concrete placed when air temperature is
at or below 5 degrees Celsius, in addition to
cold weather requirements of
CAN/CSA-A23.1/A23.2:
- .1 Protect concrete by a windproof shelter
of canvas or other material to allow free
circulation of inside air around fresh
concrete. At no point let walls of shelter
touch formwork. Provide sufficient space for
removal of formwork for finishing. Supply
approved heating equipment. Vent the products
of combustion outside the protective shelter.
Equipment shall be capable of keeping inside
air at a constant temperature sufficiently
high to maintain concrete at following curing
temperatures:
- .2 Ensure that a minimum substrate
temperature of 5 degrees Celsius shall be
achieved and maintained, prior to concrete
pour.
- .3 For an initial 3 days, at a temperature
of not less than 15 degrees Celsius nor more
than 27 degrees Celsius at concrete surfaces.
- .4 Cure at not less than 10 degrees Celsius
for an extra 4 days.
-

3.4 COLD WEATHER
PROTECTION
(Cont'd)

- .1 (Cont'd)
 - .5 Keep concrete surfaces moist continuously while protected.
 - .6 Reduce temperature at a rate not exceeding 10 degrees Celsius per day until outside temperature has been reached.

3.5 HOT WEATHER
REQUIREMENTS

- .1 When applicable, during hot weather place concrete to hot weather requirements of CAN/CSA-A23.1/A23.2, clause 21.2. Ensure concrete temperatures at placing meet the requirements of Table 15: take suitable control measures when mixing ingredients.

3.6 FIELD QUALITY
CONTROL

- .1 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.
 - .1 Ensure testing laboratory is certified to CSA A283.
- .2 Departmental Representative will pay for costs of tests.
- .3 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .4 If tests do not meet requirements of the Departmental representative, take such measures as indicated in CAN/CSA-A23.1/A23.2, after confirmed approval by the Departmental Representative.
- .5 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.
- .6 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.7 CLEANING

- .1 Cleaning of concrete equipment to be done in accordance with Section 01 35 43.
 - .2 Divert unused concrete materials from landfill to local quarry or facility after
-

- 3.7 CLEANING
(Cont'd)
- .2 (Cont'd)
receipt of written approval from Departmental
Representative.
- .3 Provide appropriate area on job site where
concrete trucks and be safely washed.

END

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This specification covers the requirements for the furnishing of all labour, materials, tools, equipment, transportation and supervision necessary to completely perform the work of metal fabrications as described on drawings and specifications.
- .2 The Work of this Section includes but is not limited to:
- .1 Shop fabrication of closure plates including steel supporting angles, as described by drawings and specifications.
- .2 Hot dip galvanizing of all steel members, fabrications, assemblies after fabrications, bolts, nuts and washers.
- .3 Transportation, installation/erection of galvanized closure plates on site including anchoring and field touch-ups, as described on drawings and specifications.
- 1.2 RELATED SECTIONS .1 Section 03 30 00: Submittal Procedures.
- 1.3 REFERENCES .1 Canadian Standards Association (CSA)-International
- .1 CSA G40.20-04(R2009)/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CSA W48-06 (R2011), Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
- .3 CSA W59-M03(R2008), Welded Steel Construction (Metal Arc Welding) Metric Version.
- .2 ASTM International
- .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A307-10, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
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- 1.3 REFERENCES
(Cont'd)
- .3 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .5 Canadian Standards Association (CSA):
 - .1 CSA W47.1-92 (R2001), Certification of Companies for Fusion Welding of Steel Structures.
 - .2 CSA W55.3-08, Certification of companies for resistance welding of steel and aluminum.
- 1.4 ACTION AND INFORMATIONAL
SUBMITTALS
- .1 Submit in accordance with Section 01 33 00 - shop drawings and product data.
 - .2 Product Data:
 - .1 Submit manufacturer's printed product literature and data sheets for woven wire mesh.
 - .3 Shop Drawings:
 - .1 Submit complete shop drawings showing all field measurements, details of the fabrication, erection and a materials list.
 - .2 Indicate materials, core thickness, finishes, connections, joints, welds, method of anchorage, supports, details, and accessories.
- 1.5 QUALITY
ASSURANCE
- .1 Execute work of this Section using a firm thoroughly conversant with metal work. Use workers skilled in this work.
 - .2 Welding: companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures or CSA W55.3 for resistance welding of structural components.
 - .3 Perform all welding work to CSA W59-03.
- 1.6 PRODUCT
DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .2 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors and in accordance with manufacturer's
-

1.6 PRODUCT
DELIVERY, STORAGE
AND HANDLING
(Cont'd)

- .2 Storage and Handling Requirements:(Cont'd)
 - .1 (Cont'd)
recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .3 Protect exposed surfaces of metal work with protective wrappings. Use materials recommended by finishers or manufacturers of metals, to ensure that method is sufficiently protective, easily removable.
- .4 Remove protective coverings when there is no longer danger of damage to metal work.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 General: metals free from defects which impair strength or durability, which are visible. New, best quality metals, free from rust, waves or buckles, clean, straight and with sharply defined profiles.
- .2 Angles and plates: to CSA G40.20/G40.21, Grade 300W, minimum 30% recycled content. Sizes and dimensions as indicated.
- .3 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts: to ASTM A307, 414 MPa as applicable.
- .6 Galvanizing: hot-dip, unpassivated, to ASTM A123/A123M, Coating Grade 85, minimum 600 g/m2.
- .7 Zinc rich primer for galvanized surfaces: zinc rich, readymix to CAN/CGSB-1.181, Ecologo certified.

2.2 ADHESIVE
ANCHORS

- .1 10 mm dia. threaded stainless steel anchor rod to ASTM F593(304/316). Minimum yield: 448 MPa.

2.2 ADHESIVE
ANCHORS
(Cont'd)

- .2 Epoxy for anchor shall be pre-packaged, two component adhesive consisting of vinyl urethane methacrylate resin and slow set hardener, mixed when dispensed from dual chamber cartridge, type recommended by anchor manufacturer. Polyester resins will not be accepted.
- .3 Use winter grade epoxy grout when temperatures are below freezing. Refer to manufacturer's recommendations.
- .4 Refer to drawings for minimum specified embedment depth and concrete edge distances.

2.3 PREPARATION

- .1 Verify dimensions of closure plates for each location indicated on the drawings on site prior to shop fabrication.

2.4 FABRICATION

- .1 Fabricate closure plates in accordance with CAN/CSA-S16 and approved shop drawings.
- .2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .3 Weld to CSA W59. File or grind welds smooth and flush with adjoining surface.
- .4 Use countersunk socket screws on items requiring assembly by screws or as indicated.

2.5 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating to ASTM Standard A123/A123M.
- .2 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

PART 3 - EXECUTION

- 3.1 EXAMINATION .1 Verification of Conditions:
.1 Visually inspect structure and substrate in presence of Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
- .2 Take site measurements to ensure that work is fabricated to fit existing construction around obstructions and projections in place, or yet to be put in place to suit service locations, and inaccuracies of construction.
- 3.2 PROTECTION .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.
- .3 Prevent galvanic action by insulating metals and other materials from direct contact with incompatible materials, such as galvanized surfaces and stainless steel.
- 3.3 SUPPLY .1 Have all items supplied in this Section on site and ready for installation without hold up or delay of work.
- 3.4 ERECTION / INSTALLATION .1 Verify that field conditions are acceptable and are ready to receive work.
- .2 Install supporting steel angles and closure plates in accordance with CAN/CSA-S16 and approved shop drawings.
- .3 Anchor supporting steel angles to concrete barriers with adhesive anchors.
- .4 Conceal bolts and screws whenever possible. Where not concealed, use countersunk socket screws as indicated on the drawings.

-
- 3.4 ERECTION /
INSTALLATION
(Cont'd)
- .5 Field welding is not allowed.
- .6 Insulate between metals and concrete with bituminous paint to prevent electrolysis.
- .7 Touch-up galvanized surfaces with zinc rich primer where damaged occurred during installation.
- 3.5 CLEANING
- .1 Progress Cleaning: 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 01 00.

END

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This section specifies the requirements for excavating and backfilling to complete work as indicated by drawings and specifications.
- .2 Work includes but is not limited to:
- .1 Removal and disposal of asphalt paving as required to allow for retaining wall replacement, including all required asphalt sawcuts.
- .2 Removal and disposal of common material as required to allow for retaining wall replacement and re-grading of adjacent area as shown on the drawings.
- .3 Supply and placing rip-rap and granular backfill in the excavated areas listed in sub-section 1.1.2.2, to subgrade.
- .4 Backfilling.
- .5 Disposing of surplus material.
- 1.2 RELATED SECTIONS .1 Section 02 41 23 - Selective Demolition.
- .2 Section 32 12 16 - Asphalt Paving.
- .3 Section 03 30 00 - Cast-in-Place Concrete.
- 1.3 DEFINITIONS .1 "Common excavation" includes all materials, excluding rock and concrete, which must be removed to complete the work including boulders and rock fragments less than 0.5 m3 in volume, and soil of whatever nature encountered. Work shall also include, but not be limited to:
- .1 Disposing of surplus material.
- .2 "Backfilling" includes:
- .1 Supplying, placing, grading and compacting granular material (Granular A, Granular B, native fill, rip-rap).
- .2 Backfilling includes filling.
- .3 "Rock": any solid material in excess of 0.5 m3 which cannot be removed by means of heavy duty mechanical excavating equipment. Concrete and frozen material are not classified as rock.
-

- 1.4 REQUIREMENTS OF REGULATORY AGENCIES .1 Adhere to municipal and provincial requirements relating to safety of excavations and protection of workers.
- 1.5 SOURCE QUALITY CONTROL .1 Sieve Series: MTO OPSS 1010 April 2004 Sieve Series or ASTM E11-09 Series equivalents.
.2 Samples and sampling: to ASTM D75/D74M-09.
.3 Maximum density and optimum moisture: to ASTM D698-07e1.
- 1.6 MATERIALS HANDLING .1 Transport, store and handle granular materials in such a manner as to eliminate segregation.
- 1.7 PROTECTION OF EXISTING FEATURES .1 Existing buried utilities and structures:
.1 Prior to commencing excavation work, notify Departmental Representative or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Departmental Representative or authorities having jurisdiction to clearly mark such locations to prevent disturbance during work.
.2 Confirm locations of buried utilities by careful test excavations.
.3 Maintain and protect from damage, steam, water, sewer, gas, electric, telephone and other utilities and structures encountered.
.4 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before re-routing or removing. Costs for such work will be paid as an extra to the contract.
- 1.8 BLASTING .1 Blasting is not permitted.
-

PART 2 - PRODUCTS

- 2.1 BACKFILL MATERIALS
- .1 Granular backfill: to Ontario Provincial Standard Specification 1010, April 2004 for:
 - .1 Granular A. Maximum size 19.0 mm.
 - .2 Granular B, Type II. Maximum size 150 mm
 - .2 Native fill: clean fill taken from area adjacent to wall section to be replaced.
 - .3 Rip-Rap: Hard, dense, durable, quarry stone, free from seams, cracks or other structural defects, with relative density not less than 2.65, to meet following size distribution:
 - .1 Not more than 10% of total volume of stones with individual volume less than 4 dm³.
 - .2 Not more than 10% of total volume of stones with individual volume of 10 dm³ or more.
 - .3 Remaining percentage of total volume to have uniform distribution of stones between 4 and 10 dm³ size.

PART 3 - EXECUTION

- 3.1 ASPHALT REMOVAL
- .1 Remove asphalt full depth and to full width of pathways and to the width required to perform the work.
 - .2 Sawcut asphalt to depth required to achieve a clean straight edge between asphalt to remain in place and new asphalt. Minimum depth of sawcut is 50 mm.
 - .3 Dispose of excavated asphalt in an approved landfill site off Canal lands.
- 3.2 SAFETY OF EXCAVATIONS AND PROTECTION OF WORKERS
- .1 Construct shoring and sheeting to depths, heights and locations as designed as part of the work of this section and accepted by Departmental Representative on the basis of accepted drawings.
 - .2 During backfill operation:
 - .1 Except as approved or directed by Departmental Representative, remove sheeting

3.4 BACKFILLING
WITH GRANULAR
BACKFILL
(Cont'd)

- .5 (Cont'd)
simultaneously on sides of structure, pipe or
other item so that loading is equalized.
- .6 Compact each layer to minimum 95% of maximum
dry density in accordance with ASTM D698-07e1.
- .7 When using hand operated tamping devices,
deposit backfill material in uniform layers
not exceeding 100 mm loose thickness.

END

PART 1 - GENERAL

- 1.1 RELATED SECTIONS .1 Section 31 23 15 - Excavating and Backfilling.
- 1.2 REFERENCES .1 Ontario Provincial Standards Specifications (OPSS).
.1 OPSS 310 - Rev. April 2008, Material Specification for Construction Specification for Hot Mix Asphalt.
- 1.3 PROTECTION .1 Protect all structures and site features that may be damaged by paving machinery, equipment or personnel. Make good property damaged due to paving operations.
.2 Take necessary precautions to protect workmen and public from hazards of paving operations.
.3 Keep all traffic off newly paved areas until paving properly cured.
- 1.4 MEASUREMENT AND PAYMENT PROCEDURES .1 There will be no measurement of Asphalt Paving.
.2 Payment of General Landscaping shall be included in the Lump Sum Price.

PART 2 - PRODUCTS

- 2.1 MATERIALS .1 Asphalt concrete: to OPSS 1150 .
.2 Prime coat: SS-1 to OPSS 1103.
.3 Tack Coat: SS-1 to OPSS 1103
.4 Granular A Aggregate to: OPSS 1010.
-

PART 3 - EXECUTION

- 3.1 GRANULAR BASE
- .1 Regrade existing granular base where needed and add granular 'A' material as required to eliminate depressions in the new asphalt and bring the granular base 50 mm below final asphalt grade. Compact granular material to 95% Standard Proctor Modified Dry Density to ASTM D1557.
 - .2 Provide new granular base where needed. Place minimum 300 mm compacted thickness of granular 'A' material sub-base and bring the granular base 50 mm below final asphalt grade. Compact granular material to 98% Standard Proctor Modified Dry Density to ASTM D1557.
- 3.2 PAVEMENT CONSTRUCTION
- .1 Apply tack coat along cold asphalt joints and exposed concrete surfaces as per with OPSS 310.
 - .2 Apply asphalt emulsion primer at 0.38 to 0.54 litres per square metre and allow to cure to sticky or tacky condition. Apply asphalt before primer becomes hard.
 - .3 Pavements thickness for wharf area: 50 mm HL 3.
 - .4 Construction of asphalt concrete: OPSS 310.07.

END

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This section specifies the requirements for reinstating damaged landscaped areas within the Work and staging areas, access route and areas disturbed by the work and consists of:
- .1 Supplying, placing, and finish grading of a topsoil bed.
 - .2 Supplying and placing nursery sod.
 - .3 Maintaining sodded areas until acceptance.
- .2 All disturbed sodded areas, within the limits of excavation zone, to be covered with topsoil, smoothed to the finish grade, and re-sodded at Contractor's expense.
- 1.2 MEASUREMENT AND PAYMENT PROCEDURES .1 There will be no measurement of General Landscaping.
- .2 Payment of General Landscaping shall be included in the Lump Sum Price.
- 1.3 RELATED SECTIONS .1 Section 01 35 43 - Environmental Procedures.
- 1.4 PRELIMINARY INSPECTION .1 Establish the condition of sodded areas in conjunction with Departmental Representative before starting work.
- 1.5 SOURCE QUALITY CONTROL .1 At least 2 weeks before starting final topsoil work, advise Departmental Representative of proposed sources of topsoil and grass seeds. Provide Departmental Representative with access to the sources for inspection, sampling and testing.
- .2 When proposed sources are approved, use no other sources without written authorization from Departmental Representative.
-

1.6 DELIVERY AND
STORAGE

- .1 Schedule deliveries in order to keep storage at the job site to a minimum without causing delays.
- .2 Deliver, unload and store rolled sod on pallets only.
- .3 Deliver sod to site within 24 hours of being lifted and lay sod within 36 hours of being lifted.
- .4 Do not deliver small, irregular, or broken pieces of sod. Departmental Representative will reject these.
- .5 During wet weather, allow sod to dry sufficiently to prevent tearing during lifting and handling.
- .6 During dry weather, protect sod and from drying. Water sod as necessary to ensure its vitality and prevent dropping soil in handling. The Departmental Representative will reject dried-out sod.

1.7 SCHEDULING OF
SODDING WORK

- .1 Schedule sod laying to coincide with final topsoil operations.
- .2 Obtain Departmental Representative's approval of the schedule for seeding before proceeding.

PART 2 - PRODUCTS

2.1 TOPSOIL

- .1 New topsoil to be a friable sandy-clayish loam of good humus content, suitable for supporting sod growth, free from:
 - .1 Debris and stones over 50 mm diameter.
 - .2 Coarse vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .2 Approval of topsoil material subject to soil testing and analysis. Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative. Departmental Representative will pay for cost of tests.
-

- 2.2 SOD .1 Nursery sod: Quality and source to comply with standards outlined in "Guide Specification for Nursery Stock", Section 17, 1978 edition, published by Canadian Nursery Trades Association.
.1 Number 1 Kentucky Bluegrass/Fescue sod" sod grown from minimum 40% Kentucky Bluegrass, 30% Creeping Red Fescue.

PART 3 - EXECUTION

- 3.1 PREPARATION OF TOPSOIL SUB-GRADE .1 Verify that grades are correct. If discrepancies occur, notify Departmental Representative and do not start other landscape work in that area until instructed to do so in writing by Departmental Representative.
.2 Grade soil, eliminating uneven areas and low spots, ensuring that new sodded surface will be faired-off to the existing sodded areas with no sharp transition.
.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material off site.
.4 Coarse cultivate entire area which is to receive topsoil to depth of 100 mm. Coarse cultivate those areas where equipment used for hauling and spreading has compacted soil.
- 3.2 PLACING AND SPREADING OF TOPSOIL .1 Place topsoil after Departmental Representative has accepted sub-grade.
.2 Spread topsoil to 150 mm minimum depth after settlement and 80% compaction. Keep final elevation 15 mm below finished grade to allow room for sod.
.3 Manually spread topsoil around trees, shrubs and obstacles.
.4 Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.
-

- 3.2 PLACING AND SPREADING OF TOPSOIL (Cont'd) .5 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative. Leave surfaces smooth, uniform and firm enough to resist deep footprints.
- 3.3 ACCEPTANCE OF TOPSOIL GRADING .1 Departmental Representative will inspect topsoil in place and determine acceptance of depth of topsoil and finish grading.
- 3.4 SURPLUS TOPSOIL MATERIAL .1 Dispose of materials not required off site.
- 3.5 SODDING .1 Obtain Departmental Representative's approval of topsoil grade and depth before starting sodding and seeding lawn.
- .2 Loosen surface of topsoil where it has become compacted.
- .3 Protect all sodded areas against any damage until sod has been fully established. Supply and install required protective apparatus.
- 3.6 SOD PLACEMENT .1 Lay sod within 18 hours of being lifted if air temperature exceeds 20 degrees C.
- .2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.
- .3 Roll sod as directed by Departmental Representative. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.
- 3.7 MAINTENANCE OF SODDED AREAS .1 Maintain sodded and seeded areas until accepted by Departmental Representative.
- .2 Apply water to ensure establishment and continuous growth of grass. Apply sufficient water to ensure moisture penetration of 200 mm into soil below sod.
-

-
- 3.7 MAINTENANCE OF SODDED AREAS
(Cont'd)
- .3 Cut grass when it reaches a height of 80 mm. Cut grass thereafter frequently enough to be kept at a height of 80 to 100 mm. Allow clippings to remain.
- 3.8 ACCEPTANCE OF SODDED AREAS
- .1 Approval of material at its source does not prevent subsequent rejection on job site.
- .2 Sodded and seeded lawn will be approved when:
- .1 Growth of sodded and seeded areas has been properly established;
 - .2 Turf is free of bare and dead spots;
 - .3 No surface soil is visible when grass has been mowed to a height of 80 mm; and,
 - .4 Grass has been cut a minimum of 2 times.
- 3.9 SODDING ON SLOPES GREATER THAN THREE TO ONE
- .1 Lay sod sections perpendicular to slopes greater than 3:1 (run/rise) and secure with stakes. Place 3 stakes per m², 100 mm below top edge to prevent shifting of sod and drive stakes flush with top of sod soil.

END

