

SPECIFICATIONS
FOR
SOUTH PIER REPAIRS
BAYFIELD, ONTARIO
REGION PROJECT
NO.



Department of Fisheries & Oceans
Small Craft Harbours Branch
Burlington, Ontario

2018

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PART 1 - GENERAL

- 1.1 MINIMUM STANDARDS .1 Execute work to meet or exceed:
- .1 National Building Code of Canada 2015, National Fire Code of Canada 2015, Ontario Building Code 2012 and any other code of provincial or local application, including all amendments up to project date, provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
 - .2 Rules and regulations of authorities having jurisdiction.
 - .3 Fire Commissioner of Canada, No. 301, Standard for Construction Operations, and No. 302, Standard for Welding and Cutting, June 1982 and Fire Protection Standard for Correctional Institutions - Treasury Board Personnel Management Manual, Occupational Safety and Health, Chapter 3-6, Feb. 1992.
 - .4 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 by O. Reg. 631/94, R.R.O. 1990, Reg. 834, Diving Operations, O. Reg. 629/94, as amended.
 - .5 Environmental Protection Act, O. Reg. 102/94 and O. Reg. 103/94.
- 1.2 TAXES .1 Pay applicable Federal, Provincial and Municipal taxes.
- 1.3 EXAMINATION .1 Before submitting bid, examine existing conditions and determine conditions affecting work.
- .2 Obtain all information which may be necessary for proper execution of Contract.
- 1.4 EXISTING CONDITIONS .1 Contractor shall be familiarized with all available data and scope, and price accordingly.
- 1.5 SITE .1 Confine work, including temporary structures, plants, equipment and materials to established limits of site.
- .2 Locate temporary buildings, roads, walks, drainage

facilities, services as directed and maintain in clean and orderly manner.

1.6 CONSTRUCTION &
STORAGE AREA

- .1 The limits of the construction and storage laydown area is shown on the drawings and shall be further coordinated with the Departmental Representative prior to commencement of work.

1.7 DOCUMENTS

- .1 Keep on site one copy of contract documents, reviewed shop drawings and submissions.
- .2 Specifications shall govern over Drawings.

1.8 CONTRACT METHOD

- .1 Construct Work under a combined price contract. All costs for work not specifically identified as a unit price item shall be included in the lump sum arrangement.

1.9 MEASUREMENT
PROCEDURES

- .1 Within 48 hours of bid acceptance submit a list of subcontractors and a detailed breakdown of costs associated with the lump sum arrangement.
- .2 Items measured for payment are in metric (SI) units.
- .3 Submit requests for payment in metric units corresponding with items on the Unit Price Table.
- .4 Submit supporting documents in metric units. Perform all necessary conversions required.

1.10 LAYOUT OF WORK

- .1 Immediately upon entering site for purpose of beginning work on this project, locate all general reference points and take proper action necessary to prevent their disturbance.
- .2 Supply stakes and other survey markers required for this work. Employ competent personnel to lay out work in accordance with lines and grades provided.
- .3 Maintain all reference points and markers for duration of contract.

1.11 CO-OPERATION &
PROTECTION

- .1 Execute work with minimum disturbance to occupants public and normal use of site work area. Make arrangements with Departmental Representative to facilitate execution of work.

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- .2 Maintain access and exits.
 - .3 Inform the Departmental Representative prior to removing the Navigational Aid, such that the Coast Guard can be informed.
 - .4 Provide necessary barriers, warning lights and signs. Protect work from damage. Replace damaged existing work with material and finish to match original.
- 1.12 EXISTING UTILITIES
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- .1 Establish location, protect and maintain existing utility lines.
 - .2 De-energize and reconnect utilities as required to suit the work and with minimum disturbance to other facilities.
 - .3 De-energize light standards from existing distribution panel. Carefully remove, salvage and store existing light standard for reinstallation. Reinstall to details as indicated on drawings.
 - .4 Existing Navigation Aid:
 - .1 Notify appropriate parties at least 2 weeks prior to disconnection of existing Navigational Aid.
 - .2 Record existing location of anchor bolt centreline prior to demolition of the existing footing.
 - .3 Existing Navigation Aid shall be carefully removed, salvaged, and temporarily stored in the parking lot for Coast Guard personnel to pickup.
 - .5 New Navigation Aid:
 - .1 New navigation aid is to be installed to the same alignment as the existing navigation aid. Contractor to verify alignment prior to fixing to the concrete base.
 - .2 Reinstate navigation aid to details as indicated on drawings.
 - .6 Material to be supplied by others: New Navigation Aid
- 1.13 MATERIALS AND EQUIPMENT
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- .1 Use new products unless otherwise specified.
 - .2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.
 - .3 When material or equipment is specified by standard

or performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.14 INSPECTION AND TESTING

- .1 The Departmental Representative may employ an Inspection and Testing company to ensure work conforms with Contract Documents.
- .2 When initial tests and inspections reveal work not to contract requirements, pay for tests and inspections required by Departmental Representative on corrected work.
- .3 Submit timely inspection and test reports to Departmental Representative.

1.15 SCHEDULING OF WORK

- .1 On award of contract submit bar chart construction schedule for work, indicating anticipated progress stages within time of completion.
- .2 When schedule has been reviewed by the Departmental Representative take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.

1.16 AS-BUILT RECORD DRAWINGS

- .1 As work progresses, neatly record significant deviations from the Contract drawings using fine, red marker on full size white prints.
- .2 Neatly print lettering and numbers in size to match original. Lines may be drawn free-hand but shall be neat and accurate. Add at each title block note: "AS BUILT RECORD".
- .3 Record following significant deviations:
 - .1 Depths of various elements and foundations.
 - .2 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
 - .3 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
 - .4 Field changes of dimension.
 - .5 Other significant deviations which are concealed in construction and cannot be identified by visual inspection.
- .4 Turn one set of marked-up As-Built Record Drawings over to Departmental Representative upon completion of work.

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- .5 If project is completed without significant deviations from contract drawings declare this in writing and submit to Departmental Representative in lieu of As-Built Record Drawings.
- 1.17 ADDITIONAL DRAWINGS
- .1 Departmental Representative may furnish additional drawings to clarify work.
- .2 Such drawings become part of Contract Documents.
- 1.18 FIRES AND TEMPORARY HEATERS
- .1 Burning of rubbish on site not permitted.
- .2 Only fires for temporary heaters are permitted on site.
- .3 Maintain temperature required to prevent frost damage to work.
- 1.19 DATUM
- .1 Elevations and soundings shown on Drawings are expressed in metres relative to chart datum.
- .2 Chart datum for Lake Huron is 176.00 metres I.G.L.D (1985).
- 1.18 OPSS AND OPSD
- .1 Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD) quoted in these specifications are available online at <http://www.raqsa.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage>.
- 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 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Submission requirements are indicated in each Part of individual Sections. The Contractor shall fully review the specifications for the full submission requirements of this project.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Do not proceed with Work affected by submittal until review is complete.
- .5 Where items or information is not produced in SI Metric units converted values are acceptable.
- .6 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .7 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .8 Verify field measurements prior to submissions and affected adjacent Work are coordinated.
- .9 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .11 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS
AND PRODUCT DATA

- .12 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as pdf files. Forward pdf files on CD or through email.
- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work. Refer to individual specifications sections for submission requirements.
- .2 Where required by specifications, submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 10 working days for Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, containing:
- .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit 3 prints and 1 electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit 3 hard copies and 1 electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit 3 hard copies and 1 electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.

- .13 Submit 3 hard copies and 1 electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
- .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit 3 hard copies and 1 electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit 3 hard copies and 1 electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Delete information not applicable to project.
- .18 Supplement standard information to provide details applicable to project.
- .19 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .20 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
- .1 This review shall not mean that the Departmental Representative 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.

1.3 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.

1.4 FEES, PERMITS
AND CERTIFICATES

- .1 Provide authorities having jurisdiction with information requested.
- .2 Pay fees and obtain certificates and permits required.
- .3 Furnish certificates and permits.

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 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Ontario
 - .1 Occupational Health and Safety Act, R.S.O. [1990 Updated 2017].

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation.
- .3 Submit 1 digital copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly.
- .4 Submit copies of reports or directions issued by safety inspectors of authority having jurisdiction.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce

the Contractor's overall responsibility for construction Health and Safety.

- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF
NOTICE

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

1.4 SAFETY
ASSESSMENT

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

1.5 MEETINGS

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

1.6 REGULATORY
REQUIREMENTS

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

1.7 PROJECT/SITE
CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Work around water.

1.8 GENERAL
REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or rejecting improvements.
- .3 Relief from or substitution for any portion or

provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.9 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 The Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act for the Province of Ontario.

1.10 COMPLIANCE
REQUIREMENTS

- .1 Comply with Ontario Health and Safety Act, R.S.O.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 UNFORSEEN
HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employee's Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.

1.12 HEALTH AND
SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
 - .1 Have working knowledge of occupational safety and health regulations.
 - .2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .4 Be on site during execution of Work and

report directly to and be under direction of site supervisor.

1.13 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Ontario, and in consultation with Departmental Representative. The following criteria is to be posted on site:
- .1 Contractor's Safety Policy.
 - .2 Constructor's Name.
 - .3 Notice of Project.
 - .4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
 - .5 Ministry of Labour Orders and reports.
 - .6 Occupational Health and Safety Act and Regulations for Construction Projects for the Province of Ontario.
 - .7 Address and phone number of nearest Ministry of Labour office.
 - .8 Material Safety Data Sheets.
 - .9 Written emergency Response Plan.
 - .10 Site Specific Safety Plan.
 - .11 Valid certificate of first aider on duty.
 - .12 WSIB "In Case of Injury At Work" poster.
 - .13 Location of toilet and cleanup facilities.

1.14 CORRECTION OF NON-COMPLIANCE

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

1.15 BLASTING

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

1.16 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to health and safety coordinator to stop or start Work when, at health and safety coordinator's discretion, it is

necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

1.1 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.

1.2 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review and approval by Departmental Representative.
- .3 Ensure Environmental Protection Plan includes comprehensive overview of known or potential environmental issues to be addressed during construction.
- .4 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .5 Include in Environmental Protection Plan, as applicable:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan identifying

type and location of erosion and sediment controls to be provided including 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.

.6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream 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.

.7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Ensure plans include measures to clean and minimize amount of mud transported onto paved public and private roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste Water Management Plan identifying 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, disinfection water, hydrostatic test water, and water used in flushing of lines.

.14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

.15 Pesticide treatment plan to be included and updated, as required.

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- 1.3 FIRES .1 Fires and burning of rubbish on site not permitted.
- 1.4 DRAINAGE .1 Provide Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls provided. Ensure plan includes 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 Storm Water Pollution Prevention Plan to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- 1.5 SITE CLEARING AND PLANT PROTECTION .1 Protect trees and plants on site and adjacent properties.
- .2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas indicated or designated by Departmental Representative.
- 1.6 WORK ADJACENT TO WATERWAYS .1 Construction equipment to be operated on land only unless placed on barges.
- .2 Do not use waterway beds for borrow material without Departmental Representative's approval.
- .3 Waterways shall be kept free of excavated fill, waste material and debris.
- .4 Design and construct temporary crossings to

minimize erosion to waterways.

- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.

1.7 POLLUTION
CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant to local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where indicated or directed by Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.8 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Do not take action until after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 CLEANING

- .1 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES .1 Access and Construction aids.
.2 Parking.
.3 Project identification.
- 1.2 REFERENCES .1 National Building Code of Canada.
.2 Provincial Legislation.
.1 Ontario Traffic Manual Book 7.
.2 Ontario Building Code.
.3 Occupational Health and Safety Act
- 1.3 SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00.
- 1.4 INSTALLATION AND REMOVAL .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
.2 Indicate use of supplemental or other staging areas.
.3 Provide construction facilities in order to execute work expeditiously.
.4 Remove from site all such work after use.
- 1.5 HOISTING .1 Provide, operate and maintain hoists/cranes required for moving of workers, materials and equipment.
- 1.6 SITE STORAGE/LOADINGS .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.

1.7 CONSTRUCTION
STAGING AND PARKING

- .1 A site storage and construction staging areas is permitted as illustrated on the Contract Drawings. The Contractor shall take responsibility for the use, maintenance and reinstatement of the staging areas.
- .2 Provide and maintain adequate access to project site.
- .3 Parking will be permitted on site provided it does not disrupt performance of Work.
- .4 Build and maintain temporary roads as required to undertake the Work and provide snow removal during period of Work.
- .5 When using existing public and private roads for access to project site, maintain such roads for duration of Contract and repair damage resulting from Contractors' use of the roads.

1.8 ACCESS TO PIERS

- .1 Provide access to piers via the land side or water side as required.
- .2 Provide snow clearing of the work site as required to undertake the work. Maintain the parking area and road leading up to the work site where the laydown area impedes snow clearing by others.

1.9 EQUIPMENT, TOOL
AND MATERIALS STORAGE

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

1.10 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.

1.10 CONSTRUCTION
SIGNAGE

- .1 Provide and erect, within 3 weeks of signing Contract, one project identification signs in locations designated by Departmental Representative.
 - .1 Indicate on sign, name of Owner, Consultant and Contractor, of a design style approved by Departmental Representative.

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- .2 Provide 1200 x 1800 mm identification site sign comprising of foundations and framing.
 - .2 Provide and erect all local construction safety, notice and warning signage around the site.
 - .3 Provide and erect construction signage on public and private roads leading to the project site, to provide advance warning of a work zone for long duration operations.
 - .4 No other signs or advertisements, other than warning signs, are permitted on site.
 - .5 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.
- 1.13 PROTECTION AND MAINTENANCE OF TRAFFIC
- .1 Provide access to temporary facilities as applicable.
 - .2 Maintain and protect traffic on affected roads during construction period.
 - .3 Provide measures for protection and temporary diversion of traffic, including provision of flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
 - .4 Protect travelling public from damage to person and property.
 - .5 Contractor's traffic on roads selected for hauling material to and from site shall interfere as little as possible with public traffic.
 - .6 Verify adequacy of existing roads and allowable load limit on these roads. The Contractor shall be responsible for repair of damage to roads caused by construction operations.
 - .7 Construct access and haul roads necessary with suitable grades and widths.
 - .8 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
 - .9 Dust control: adequate to ensure safe operation at all times.
 - .10 Provide snow removal where required during period of Work.

- .11 Remove, upon completion of work, all temporary facilities required to undertake the work.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed from removal.

- 3.2 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.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES .1 Barriers.
.2 Environmental Controls.
.3 Traffic Controls.
.4 Fire Routes.
- 1.2 RELATED SECTIONS .1 Section 01 52 00 - Construction Facilities.
- 1.3 REFERENCES .1 National Building Code of Canada.
.2 Provincial Legislation:
.1 Ontario Building Code.
.2 Occupational Health and Safety Act.
- 1.4 INSTALLATION AND REMOVAL .1 Provide temporary controls in order to execute Work expeditiously.
.2 Remove from site all such work after use.
- 1.5 PROTECTION .1 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.
.2 Maintain barriers in good working order. Daily inspect barriers and repair expeditiously.
- 1.6 SECURITY .1 Provide temporary site enclosure around the Work areas and construction staging area, using modular freestanding fencing.
.1 Galvanized, 1.8 m high chain link or welded steel mesh with pipe rails.
.2 Provide spaced lockable entrances for equipment and workers, with locks and keys.
.2 Maintain barriers in good working order. Daily inspect barriers and repair expeditiously.
- 1.6 GUARD RAILS AND .1 Provide secure, rigid guard rails and barricades

BARRICADES

around deep excavations and open edges as required by governing authorities.

1.7 ACCESS TO SITE

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

1.8 PUBLIC ACCESS
ROUTES AND PROPERTY

- .1 Maintain and safeguard public access to areas outside of the Work area. Temporary utilization or obstruction of public areas is not permitted unless approved by Departmental Representative.
- .2 Protect surrounding private and public property from damage during performance of Work.
- .3 Be responsible for damage incurred.

1.9 FIRE ROUTES

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

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 SCOPE .1 This Section covers the requirements for management of construction/demolition materials.
- 1.2 REFERENCES .1 Canadian Environmental Protection Act (CEPA 1999)
.2 Ontario Regulations
.1 Ontario Regulation 102/94.
.2 Ontario Regulation 103/94.
.3 Ontario Regulation 347 / 558.
.4 Ontario Regulation 213/91 (Occupational Health and Safety Act, OHSA).
- 1.3 CONSTRUCTION AND DEMOLITION WASTE .1 Carefully remove, deconstruct, source separate materials and divert from waste destined for landfill to maximum extent possible. Reuse, recycle, compose, anaerobic digest or sell material for reuse except where indicated otherwise. On site sales are not permitted.
.2 Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.
.1 Provide facilities for collection, handling and storage of source separated wastes.
.2 Source separate the following waste:
.1 Concrete
.2 Wood
.3 Steel
.4 Aggregate
.5 Bituminous Pavement
.6 Organic vegetation
.3 Identify opportunities for reduction, reuse, and recycling of materials, where possible.
.4 Accomplish maximum control of solid construction waste.
.5 Preserve environment and prevent pollution and environment damage.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prior to removing materials, provide written authorization from the third party property owner(s) accepting disposal materials as non-hazardous solid waste.
- .3 Provide a summary report of the disposed material (by quantity or weight) sent to third party property owner(s) versus material that was reused, sold or recycled.
- .4 Submit a Waste Reduction Work Plan indicating the materials and quantities of material that will be recycled and diverted from landfill, where possible.

1.5 WASTE
PROCESSING SITES

- .1 Contact local and Provincial governments for information on area waste management facilities.
- .2 For the Province of Ontario, contact the Ministry of Environment and Climate Change, 135 St. Clair Avenue West, Toronto, ON, M4V 1P5.
- .3 Contact the Recycling Council of Ontario (www.rco.on.ca) for listings of companies and agencies providing services and products related to the waste diversion and recycling.

1.6 STORAGE,
HANDLING AND
PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal do become Contractor's property. Contractor is responsible for disposing of these materials and choosing authorized landfill site.
- .3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .4 Protect, stockpile, store and catalogue salvaged items.
- .5 Protect structural components not removed for demolition from movement or damage. In the event of damage, make repairs and replacements to the approval of, and at no additional cost, to the Departmental Representative.
- .6 Support affected structures. If the safety of any component is endangered, cease operations and

immediately notify Departmental Representative.

- .7 Separate and store materials produced during dismantling of structures in designated areas.
- .8 Store treated wood on site in a temporary containment area set up for this purpose to prevent streaming water from reaching aquatic environment.

1.6 DISPOSAL OF WASTES

- .1 Do not bury or burn rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil or paint thinner into waterways, storm, or sanitary sewers.
- .3 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .4 All waste materials should be disposed of in a legal manner at a site approved by Local Authorities.
- .5 Evacuate waste materials out of site along with work progress.
- .6 Prepare project summary to verify destination and quantities on a material-by-material basis as identified.
- .7 Recover, sort and separate waste generated by demolition into categories in preparation for transfer to various licensed sites. Contractor shall recover (reuse and/or recycle) non contaminated materials before disposal:

.1 Rock and other granular materials to be removed from existing structures will be recovered and reused for the construction of new structures, if they meet the specification requirements.

.2 Wood residues from construction must be managed according to the best practices and standards in effect.

1.6 SCHEDULING

- .1 Co-ordinate waste management and source separation with other activities at site to ensure timely and orderly progress
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil or paint thinner into waterways, storm, or sanitary sewers.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 GENERAL .1 Arrange for suitable disposal for waste materials.
.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.
.3 Source separate materials to be reused/recycled into specified sort areas.

3.2 CLEANING .1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
.2 Clean-up work area as work progresses.

PART 1 - GENERAL

- 1.1 SCOPE .1 This Section covers all work related to demolition, salvage, removal, and in-place abandonment, either completely or partially, of materials and structures.
- 1.2 MEASUREMENT PROCEDURES .1 All items for removal will be covered under the Lump Sum arrangement.
- .2 Payment at the Contract price of unit rate tender items shall be full compensation for all labour, permits, equipment and material to do the work.
- 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
- .3 Occupational Health and Safety Act, OHSA / O. Reg. 213/91
- 1.4 RELATED REQUIREMENTS .1 Section 01 74 21 - Construction / Demolition Waste Management and Disposal.
- 1.5 UNDERSTANDING THE SITE .1 As part of the tender process, the Contractor shall become familiar with the site. Sufficiently assess all relevant information and constraints of the site to provide a clear understanding of the state and condition of the site.
- .2 Assess access routes those are safe and convenient to use, to / from and around the site.
- .3 Contractors should be satisfied that they have all the information necessary to undertake the work in a safe and efficient manner, including the development of a Health and Safety Plan.
- 1.6 PROTECTION .1 Prevent movement, settlement or damage of existing structures during construction. Do not use equipment that will compromise the integrity of the

existing structure prior to removal.

- .2 Perform removals with methods and equipment as to leave undisturbed and undamaged any portion not designated for removal or salvage. All damaged or disturbed portions shall be corrected and repaired to the satisfaction of the Departmental Representative. Broken edges of components to be left in place shall be squared and neatly trimmed.
- .3 The Contractor shall fully review the scope of work at the existing structure for planning, operational constraints and movement of equipment.
- .4 The Contractor shall be held responsible for damage to adjacent facilities caused through the performance of the work.
- .6 The Contractor may use the existing structure at their own risk to complete removals. The Department will not be held liable for the structural competency of the existing structure during demolition.
- .7 Provide area utility locates prior to removals. The Contractor shall be held responsible for damage to the embedded conduit caused through the performance of the work.
- .8 No accumulation of demolished material will be permitted on the piers. Remove materials daily from the pier to ensure that materials are not stored on the piers overnight.
- .8 The Contractor shall be held responsible for damage to existing tie rods and walers caused through the performance of the work.

1.7 PERSONAL PROTECTION

- .1 Provide appropriate Personal Protective Equipment (such as gloves, long-sleeve shirt, dust masks and eye protection, etc.) for workers handling designated substances including, but not limited to:
 - .1 chemicals found in treated timbers.
 - .2 quartz silica found in common construction materials.
 - .3 benzene found in equipment fuels.
 - .4 zinc found in galvanized materials.
 - .5 vinyl chloride found in PVC duct work.
 - .6 other hazards and substances which may be present on the site.
- .2 Ensure that sufficient ventilation is provided where sawcutting is occurring.

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- .3 Provide suitable hand washing stations for workers to wash hands immediately after handling and prior to eating or drinking.
- 1.8 DESIGN AND SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Design and plan for:
- .1 The protection of the public, workers, adjacent properties, existing structures and the environment.
 - .2 The effects of component removals on the remaining / existing structure.
 - .3 The effects of weather on demolition activities.
 - .4 Surveying and monitoring during removal processes to ensure structural competency.
 - .5 Working platforms, as required, to undertake the demolition work.
 - .6 Use of hand-held equipment, as required, to reduce risk in localized areas of the work.
 - .7 Accumulation of debris, efficient materials handling and controlled removals.
- .3 Submit a Removals and Operational Plan. The submission shall be submitted 2 weeks prior to the commencement of removals, shall have sufficient detail and shall including:
- .1 Work drawings showing the extents of removals.
 - .2 Layout and description of removal sequences and proposed equipment.
 - .3 The locations, loadings, and detailed descriptions of heavy equipment and vehicles to be supported on existing structure.
 - .4 Access methodologies, planned vehicle routes and all equipment.
 - .5 Movement and storage of materials on-site prior to removal off site.
 - .6 Dust and debris control.
- .4 Refer to Section 01 74 21 for additional requirements.
- 1.9 MATERIALS FOR SALVAGE
- .1 Any material designated for salvage in the Contract Documents shall remain the property of the Owner and shall be maintained in a reasonable condition and stockpiled in a manner acceptable to the Department Representative.

- .2 Materials to be removed and salvaged for turn over to the Departmental Representative include:
 - .1 navigational aid
- .3 Materials to be removed and reinstated include:
 - .1 light standards

PART 2 - PRODUCTS

2.1 EQUIPMENT

- .1 Utilize appropriate equipment and machinery for the performance of the work. Use alternative equipment and machinery when they product to be insufficient.
- .2 Restrict the size of equipment and machinery being used for materials being salvaged, to ensure best condition possible.
- .3 Provide equipment and machinery such as barges for access, as required.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Do Work in accordance with Section 01 35 29.06 - Health and Safety Requirements and CSA 350.
- .2 Protection:
 - .1 Keep noise, dust, and inconvenience to occupants to minimum.
 - .2 Provide temporary dust screens, covers, railings, supports and other protection as required.

3.2 GENERAL DEMOLITION AND DISPOSAL

- .1 Remove the existing superstructure to permit new construction. Sort materials into piles for reuse and recycling.
- .2 Legally dispose all removed materials off the site, conforming to Section 01 74 21.
- .3 Neatly demolish and remove all components within the limits of removal as indicated on the drawings.
- .4 During and after construction, all remaining scraps, cuttings, wood chips and sawdust must be

collected efficiently and in a timely manner. All wood waste must be collected and disposed of in accordance with local and provincial regulations.

.5 Progressive removals should be employed on sections of the structure, to ensure that overloading of the existing structure does not occur.

.6 Expeditiously remove materials from pier as demolition and disassembly Work progresses.

3.3 CONCRETE REMOVALS

.1 Do not use heavy equipment such as rig mounted breakers adjacent to the sheet pile, above wales and adjacent to existing concrete to remain. Take all precautions possible to remove concrete without damage to structural components to remain.

.2 Use jackhammers (with a maximum weight of 14 kg) or chipping hammers (with a maximum weight of 9 kg) where required to ensure protection of the structure.

.3 Damage to existing structures shall be reported immediately.

3.4 MATERIALS FOR SALVAGE

.1 Remove and adequately store identified materials identified for salvage.

.2 Take all precautions possible to remove components without damage and to suitably store the components on at a designated location on site as determined by the Departmental Representative.

3.5 STRUCTURAL COMPETENCY

.1 Limit the number and weight of rig-mounted breakers, concrete crushers, cranes, vehicles and other heavy equipment used for removals.

.2 Maintain separation of equipment on the piers to ensure structural competency during removal or new construction.

.3 Utilize barges as required to minimize loading on the existing piers.

3.6 CLEANING AND RESTORATION

.1 Keep site clean and organized throughout demolition procedure. Upon completion of project, reinstate areas affected by Work to condition which existed prior to beginning of Work or better subject to the approval of Departmental Representative.

PART 1 - GENERAL

1.1 SCOPE

- .1 This Section covers all work related to Cast-in-Place Concrete (for the deck, light standard bases, navigational aid base, and bollard bases) including concrete material, accessories, placement, finishing, curing and protection.

1.2 MEASUREMENT PROCEDURES

- .1 Concrete in Deck will be measured by volume in cubic metres of concrete placed, as calculated from neat dimensions as indicated on drawing.
- .2 Concrete and grout in bollard bases will be paid as part of the unit cost for bollards installed.
- .3 Concrete in bases for light standards (including anchorages) will be paid for in the lump sum arrangement.
- .1 There will be no separate payment or measurement for the removal, storage or reinstatement of the light pole base, including anchorages and electrical hookup.
- .4 Concrete in the navigational aid based (including anchorages) will be paid for in the lump sum arrangement.
- .1 There will be no separate payment or measurement for the removal of the existing navigational aid. There will be no separate payment for the instatement of new navigational aid (supplied by the Departmental Representative), anchorage.
- .5 Payment at the Contract price of unit rate tender items shall be full compensation for all labour, equipment and material to do the work, including reinforcing steel.
- .6 No deductions will be made for volume of concrete displaced by reinforcing steel, structural steel, or piles.
- .7 Expansion joints, control joints, reinforcing steel, splices, wire ties, bar supports, chairs, spacers, dowels, anchor bolts, nuts and washers and bolt grouting shall be considered included in the placing of concrete and will not be measured

separately for payment.

- .8 Hot and cold weather protection will be considered included in the placing of concrete and will not be measured separately for payment.
- .9 Concrete tickets may be submitted for reference only but will not form the basis of volume. Concrete wastage will be included in the volume for payment.

1.3 PAYMENT

- .1 Concrete work will be valued for payment in accordance with the following schedule, subject to any applicable holdbacks.
 - .1 60 percent at completion of casting (times volume times tender item unit rate)
 - .2 30 percent at completion of curing (times volume times tender item unit rate)
 - .3 10 percent at completion of final finishing after curing (times volume times tender item unit rate)

1.4 REFERENCES

- .1 Reference Standards:
 - .1 Reinforcing Steel Manual of Standard Practice, Reinforcing Steel Institute of Canada
 - .2 ASTM International
 - .1 ASTM A 82/A 82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - .2 ASTM A 185/A 185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .3 ASTM C 260/C 260M-10, Standard Specification for Air-Entraining Admixtures for Concrete.
 - .4 ASTM C 494/C 494M-10, Standard Specification for Chemical Admixtures for Concrete.
 - .5 ASTM C 1017/C 1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - .6 ASTM D 1751-04(2008), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 - .7 ASTM D 1752-04a(2008), Standard Specification for Preformed Sponge Rubber

Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.3 CSA International

.1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.3 CSA-G30.18-09 (R2014), Carbon Steel Bars for Concrete Reinforcement.

.4 CSA-G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CSA W186-M1990(R2016), Welding of Reinforcing Bars in Reinforced Concrete Construction.

.6 CSA S269.1-16, Falsework and Formwork.

1.5 RELATED REQUIREMENTS

.1 Section 35 59 14 - Miscellaneous Metals.

1.6 SUBMITTALS

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

.2 Submit shop drawings for formwork exceeding 1.0 m in height.

.1 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

.3 Prepare and submit detailed reinforcement placement drawings in accordance with RSIC Manual of Standard Practice. Shop drawings shall include:

.1 Layout of steel reinforcement including sizing, spacing, lap lengths and bar mark.

.2 General dimensions of the structure upon which the bar details were based upon.

.3 Bar lists including sizes, bends details, and quantities

.4 Bar identification, marks, etc. for organizing placement

.5 Indicate sizes, spacings and locations of chairs, spacers and hangers

.6 Provide type B tension lap splices unless otherwise indicated.

.7 Pour limits shall be indicated.

- .4 Concrete Pour Release forms (filled prior to each pour).
- .5 Provide concrete supplier certification that the plant is certified with Concrete Ontario (formerly the Ready-Mix Concrete Association of Ontario).
- .6 Provide concrete mix designs including statement that the admixtures are compatible with each other.
- .7 Provide documentation that the aggregates comply with CSA A23.1 and are from a MTO approved source. Submit gradations of the coarse and fine aggregates.
- .8 Weather Protection Plans (hot and cold temperature weather conditions)
 - .1 It shall be the full responsibility of the Contractor to review the schedule, anticipate the impacts of work / concreting, and incorporate the costs for such weather protection schemes and associated works. (For example, this may include incorporating measures such as ice or liquid nitrogen for concrete in hot weather concrete).
 - .2 When concrete is to be placed and curing in extreme temperature conditions (less than 5 degrees Celsius and more than 25 degrees Celsius), the Contractor shall submit written descriptions of proposed methods of providing appropriate concreting conditions, and preventing cold weather damage (with drawings or sketches, as required).
 - .3 Incorporate modification (from comments provided) for protective measures before placing concrete.
- .9 Provide a concrete finishing plan including procedures for curing and final finishing.
- .10 Provide a concrete repair submission as required to address defects in the poured concrete.

1.7 QUALITY
ASSURANCE

- .1 Provide certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, prior to beginning reinforcing work.
- .2 Provide The concrete supplier shall be certified member of the Concrete Ontario (formerly the Ready-Mix Concrete Association of Ontario).
- .3 No water is to be added to the mix following initial batching at the plan without the consent of the Concrete Supplier designated representative and the Departmental Representative.

1.8 DELIVERY,
STORAGE AND
HANDLING

- .1 Concrete Delivery and Acceptance Requirements:
 - .1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
 - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

- .1 Establish the proportions of cementing materials, aggregates, water, and admixtures required to produce consistent / workable concrete that has the required strength and other properties required for improved durability, reduced shrinkage and reduced cracking.
- .2 Performance Method for specifying concrete: Performance criteria according to this specification as permitted by CSA Standard A23.1.

2.2 QUALITY CONTROL
PLAN

- .1 The Contractor and Concrete Supplier shall implement a Quality Control Plan to ensure verification and compliance that the concrete meets performance criteria established in this specification.

2.3 MATERIALS

- .1 Concrete
 - .1 Cementing materials to CSA Standard A3000:
 - .1 Type GU.
 - .2 Slag (as a cement replacement 20% to 35% by mass of the quantity of total cement content) is permitted
 - .2 Compressive strength: 30 MPa at 28 days.
 - .3 Exposure class: F-1 to CSA-A23.1/A23.2.
 - .4 Aggregate conforming to CSA Standard A23.1 with sizes:
 - .1 20 mm for standard mixes.
 - .5 Admixtures:

- .1 Air entraining.
- .2 Water reducing agents, as required.
- .2 Plant added.
- .2 Calcium chloride not permitted.

- .6 Water: to CSA-A23.1/A23.2.
- .7 Slump: 80 mm at time of deposit, ± 20 mm or as amended by the Contractor to suit the work.

- .2 Grout shall be flowable course fill cementitious grout, with a compressive strength of 15 MPa at 28 days and a slump of 120 mm ± 30 mm.

- .3 Reinforcing steel bars: carbon steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.

- .4 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.

- .5 Chairs, bolsters, bar supports, spacers: to CSA Standard A23.1/A23.2.

- .6 Formwork materials: Wood product formwork materials to CSA Standard O86.

- .7 Form ties: To be removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

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

- .9 Bituminous impregnated fiber board: to ASTM D 1751.

- .1 Joint sealant: Cold applied, single component, chemically curing silicone to ASTM D5893
 - .1 low modulus
 - .2 weather and UV resistant
 - .3 unprimed adhesion (primer not required for adhesive to concrete)

- .10 Anchorages for the poles and navigational aid shall be ASTM A307 or greater.

- .11 Anchors into concrete shall be chemical adhesive.
 - .1 Hilti Hit HY 200 or Redhead A7+ Adhesive Fastening System with zinc plated threaded rods.
 - .2 Alternate anchoring systems may be substituted in place as specified above, with the approval of the Department Representative.

.3 Expansion type anchors are not permitted

.12 Joint Sealant:

.1 Caulking for joints: Single component, non-staining, silicone sealant, grey.

.2 Conforming to ASTM C1184.

2.4 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA Standard A23.1/A23.2, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Do not weld reinforcement unless otherwise approved by the Departmental Representative.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.5 MIXES

- .1 Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.
- .2 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Obtain Departmental Representative's release before ordering and placing concrete.
 - .1 Provide Pour Release Form and notice to pour concrete 24 hours minimum prior to placing concrete.
 - .2 Provide a completed Concrete Pour Release Form (to be provided) prior to each pour and allow the Departmental Representative 2 hours for inspection. Have each trade sign to indicate its work is complete and ready for checking, as well as the General Contractor's representative. The use of the pour release form does not relieve the Contractor of his responsibility to complete the Work accurately.

- .3 Do not order concrete until the Concrete Pour Release Form has been signed by the Contract Administrator.
- .2 During concreting operations:
 - .1 Development of cold joints not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .4 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .5 Protect previous Work from staining.
- .6 Clean and remove stains prior to application for concrete finishes.
- .7 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .8 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy adhesive to anchor and hold dowels in positions as indicated.
- .9 Thoroughly clean joints to receive sealant. Place foam backer rod. Do not apply sealant to wet or damp concrete.
- .10 Do not place load upon new concrete until authorized by Departmental Representative.
- .11 Comply with CSA Standard A23.1 'Concrete Materials and Methods of Concrete Construction.'

3.2 PREPARATION

- .1 Verify lines, levels and centres before proceeding with formwork/falsework. Ensure dimensions and elevations agree with drawings.
 - .1 Form 12 mm chamfers at formed concrete edges, unless shown otherwise on the Drawings.
 - .2 Laterally brace formwork and falsework and prevent displacement during concrete placement. Form chases, openings, projections, recesses, expansion joints and construction joints. Incorporate frames, castings, pipes, sleeves, and

similar items into the formwork

- .2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Fabricate and erect formwork to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA Standard A23.1.
- .5 Verify concrete elevations in advance of the pour. Mark on forms, install screed markers or provide other means establishing final elevations during concrete pours.
- .6 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .7 Align form joints and make watertight. Keep form joints to minimum
- .8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .9 Build in anchors, sleeves, and other inserts required to suit Work specified in other sections. Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .10 Remove all waste material, cut tie wire and other materials from the pour area. Clean formwork in accordance with CSA Standard A23.1 before placing concrete.
- .11 Coordinate the requirements of all trades and assume responsibility for location, installation and quality of all items which affect the Work of this Section.

3.3 FIELD BENDING OF REINFORCEMENT

- .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.

3.4 PLACING
REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA Standard A23.1/A23.2.
- .2 Prior to placing concrete, allow for sufficient time for the review of reinforcing steel and arrangement of the Departmental Representative.
- .3 Ensure cover to reinforcement is maintained during concrete pour.

3.5 PLACING CONCRETE

- .1 Undertake cast-in-place concrete work conforming to CSA Standard A23.1/A23.2.
- .2 Plan concrete pours to suit the weather conditions. Adjust pour sequences or schedules to avoid adverse weather conditions. Do not cast concrete during rainfalls. Do not cast slabs during high winds. Follow cold weather and hot weather procedures when those temperatures exist or may be expected.
- .3 Do not commence concrete placing until sufficient manpower and equipment is available to complete the placement expeditiously preventing the formation of cold joints, and to produce the specified surface finish.
- .4 Joint fillers:
 - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Departmental Representative.
 - .2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
 - .3 Locate and form isolation joints as indicated.
 - .4 Install joint filler.
 - .5 Install joint sealant where indicated on the drawings.
- .5 Verify that accessories, inserts, bollards, and reinforcement are set correctly and are not disturbed during concrete placement.
- .6 Place concrete on dry and clean substrate.
- .7 Place concrete within 1 metre of its final position. In formed sections, provide sufficient elephant trunks to meet this requirement.
- .8 Do not move concrete laterally with the vibrators. Lower the vibrators vertically, and vibrate within

-
- 1 m of the point of placement.
- .9 Depositing and consolidation.
- .1 Deposit concrete in a manner that prevents segregation in accordance with CSA Standard A23.1.
- .2 Consolidate the concrete during and immediately after depositing, thoroughly and uniformly by means of tamping, hand tools, finishing machines, and vibrators in order to obtain dense, watertight, homogeneous concrete well bonded to reinforcing bars. Carefully vibrate concrete around appertenances to ensure thorough contact.
- 3.6 SURFACE TOLERANCE
- .1 Finish unformed surfaces true to grade and free of surface irregularities exceeding 3 mm under a 3 metre straight edge in any direction.
- 3.7 POUR LIMITS
- .1 To reduce shrinkage induced cracking, the Contractor shall plan for the following limitations in pour lengths.
- .1 Horizontally from expansion joint locations
- .2 Pour deck in segments along the piers to increase daily production.
- .3 Allow 3 days between adjacent segments.
- 3.8 FINISHING AND INITIAL CURING
- .1 Finish concrete to CSA Standard A23.1/A23.2.
- .2 In addition to cold weather requirements listed in CSA Standard A23.1, protect concrete against drying shrinkage and plastic shrinkage for slabs. Take special precautions to control and eliminate initial drying shrinkage and plastic shrinkage for slabs. Provide wind breaks, shelters or shades.
- .3 Keep concrete surfaces moist continuously while the concrete is protected.
- .4 Initial finishing shall be by bull floats and darbies, sloped as indicated on drawings. Finish finishing for air entrained concrete shall be using magnesium float for slabs or other means as approved by the Departmental Representative.
- .5 Finish finishing for air entrained concrete shall be using magnesium float for slabs or other means as approved by the Departmental Representative. Use

a concrete broom on deck slabs for a non-slip finish.

- .6 During curing period, uncover only such areas as are immediately needed for finish treatment. Recover and continue curing.
- .7 When concrete has set sufficiently, give surface a uniform broom finish free from porous spots, irregularities, depressions, small pockets or rough spots
- .8 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

3.9 FIELD QUALITY CONTROL

- .1 Inspection and testing of concrete and concrete materials may be carried out by testing laboratory designated by Departmental Representative:
 - .1 Slump, air and concrete temperature (each truck or until consistency is established).
 - .2 Two (2) sets of cylinder with compressive strength tests for the deck pour, from different trucks (test 1 cylinder at 7 days and 2 cylinders at 28 days).
- .2 The Contractor shall undertake independent testing for verification and quality control.
- .3 Test results shall shared and distributed for discussion at site meetings.

3.10 CURING

- .1 Immediately after placing fresh concrete and until finishing, maintain 100% humidity in the air at the concrete surface with a spray fogging device (or other means) to prevent plastic shrinkage cracks in the concrete surface. The fresh concrete surface must be kept damp, but with no standing water, until finishing is complete.
- .2 When the finishing is complete immediately cover the concrete with a continuous polyethylene sheet.
- .3 Continuously wet cure concrete for 5 days. Provide the equipment necessary for the proper curing adjacent to the Work before commencing pouring.
- .4 Be responsible for protection of concrete from damage by all trades and the public. Do not pile or store materials on slabs nor wheel nor handle materials over slabs until concrete has been in place for 10 days (under normal conditions).

- .5 Leave formwork in place for 5 days following placing of concrete.
- .6 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.

3.11 HOT WEATHER
WORK

- .1 Take hot weather precautions when the concrete temperature at any time exceeds 25 degrees C and do not place concrete, whose temperature exceeds 30 degrees C. in the mixer.
- .2 Incorporate the cost of these measures between (and including) the months of June and August.
- .3 Concrete, whose temperature in the mixer is between 27 degrees C. and 30 degrees C. must contain a retarder which reduces mixing water requirements and increases strength and must contain high early strength cement.
- .4 Protect forms and equipment, including both mixing and placing equipment, from the rays of the sun and cool by wetting as necessary to maintain a temperature of not more than 5 degrees C. in excess of ambient temperature nor more than 40 degrees C.
- .5 Keep mixing time to the minimum, consistent with the production of the quality of concrete specified and place mixed concrete immediately.
- .6 Provide wind breaks, sun shades, plastic sheeting or other materials as required by CSA Standard A23.1 when the evaporation is expected to exceed the limits shown.
- .7 Commence continuous wet curing as soon as the concrete has hardened sufficiently to prevent surface damage.

3.12 COLD WEATHER
WORK

- .1 Take cold weather precautions whenever the ambient temperature is, or is expected to be, at or below 5 degrees C.
- .2 Incorporate the cost of these measures between (and including) the months of October and April.
- .3 Have protective measures in place, or adjacent to the Work, and approved by the Contract Administrator before any concrete is mixed or ordered.

- .4 Maintain concrete temperatures between 10 degrees C. and 20 degrees C. for a minimum of 3 days for unloaded areas, and 6 days for areas receiving partial load.
- .5 At the termination of the protection period, do not drop the concrete temperature more than 20 degrees Celsius in the first 24 hr.

3.13 REPAIRS

- .1 Upon review of concrete finish, undertake all preventative and correction actions to prevent further concrete defects from occurring.
- .2 Concrete elements having one or more defects and deficiencies shall be repaired according to an acceptable procedure with the Department Representative. Standard finishing shall be completed after such repairs are carried out.
- .3 Concrete defects are defined as
 - .1 Air voids, honeycombing, cavities, spalling, delamination, greater than 5 mm in size in any direction.
 - .2 Bugholes greater than 10 mm in diameter or 5 mm in depth
 - .3 Plastic shrinkage cracking with a width greater than 0.4 mm.
 - .4 General shrinkage cracking with a width greater than 0.7 mm.

3.14 JOINTS

- .1 Sawcut control joints within 24 hours of the final concrete set time. Install 25 mm bead of silicone sealant in each joint.
- .2 Install joint filler between each pour at expansion joints. Install 25 mm bead of silicone sealant in each joint.

3.15 CLEANING

- .1 Promptly as the Work proceeds and upon completion, clean-up and remove from the site, rubbish and surplus material resulting from the Work of this Section.

PART 1 - GENERAL

- 1.1 SCOPE .1 This Section covers aggregate fill materials for structures.
- 1.2 MEASUREMENT PROCEDURES .1 Clear Stone (for filling of voids in existing structure) will be measured in tonnes of material placed.
- .2 Granular A fill (for grading below the concrete deck) will be measured in tonnes of material placed.
- .3 Armour Stone (for south side of pier from approximately Station 0+088 to 0+123) will be measured in tonnes of material placed.
- .4 Stone Fill (for south side of pier from approximately Station 0+076 to 0+088) will be measured in tonnes of material placed.
- .5 Payment at the Contract price of unit rate tender items shall be full compensation for all labour, equipment and material to do the work.
- .6 Aggregate weight tickets may be submitted in support of material placed, provided that the material is confirmed installed.
- 1.3 RELATED REQUIREMENTS .1 Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- 1.4 REFERENCES .1 American Society for Testing and Materials (ASTM)
- .1 ASTM D 4791-[99], Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .2 Ontario Provincial Standard Specifications (OPSS)
- .1 OPSS.MUNI 1004 November 2013, Material Specification for Aggregate - Miscellaneous.
- .2 OPSS.MUNI 1010 November 2013, Material Specification for Aggregate - Base, Subbase, Select Subgrade, and Backfill Material.
- 1.5 SAMPLING .1 Allow sampling by Departmental Representative as

required.

- .2 Provide Departmental Representative with access to source and processed material for sampling.

1.6 SUBMITTALS

- .1 Provide the source of aggregates and provide access for sampling at least 2 weeks prior to commencing production.

1.7 COORDINATION

- .1 Navigation within Bayfield River shall be considered active at all time. Ensure all activities associated with this construction are done in a manner that is compatible with the use the River. Protect the public, the marina facilities, the boats, and the boaters from adverse effects from all construction activities.
- .2 Keep the Department Representative advise of the installation activities and schedule.

1.8 LAYOUT

- .1 The Contractor shall be responsible for all the layout of all new construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D 4791.
 - .1 Greatest dimension to exceed five times least dimension.
- .3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
 - .1 Natural sand.
 - .2 Manufactured sand.
 - .3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
- .4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of

following:

- .1 Crushed rock.
- .2 Gravel and crushed gravel composed of naturally formed particles of stone.
- .3 Light weight aggregate, including slag and expanded shale.

- .5 Armour Stone.
 - .1 Size range 600 mm to 1200 mm

- .6 Clear stone (20 mm diameter) for void fill: to Ontario Provincial Standard Specification OPSS.MUNI.1004.
 - .1 Size range 19 mm to 75mm, with gradation:

Sieve Designation	% Passing
75 mm	100
40 mm	20
19 mm	0

- .7 Granular A: to Ontario Provincial Standard Specification OPSS.MUNI.1010.

- .8 Stone Fill for south side of pier shall be within the 50 mm to 100 mm range (or approved alternate).

2.2 SOURCE QUALITY CONTROL

- .1 If, in opinion of Departmental Representative, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

- .2 Advise Departmental Representative 4 weeks in advance of proposed change of material source.

- .3 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Processing
 - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
 - .2 Blend aggregates, if required, to obtain

- gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by Departmental Representative.
- .3 Wash aggregates, if required to meet specifications. Use only equipment approved by Departmental Representative.
 - .4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.
- .2 Handling
 - .1 Handle and transport aggregates to avoid segregation, contamination and degradation.
 - .3 Stockpiling
 - .1 Do not stockpile aggregates on site approved otherwise by Departmental Representative.
 - .4 Secure the areas of work from public access.

3.2 PLACEMENT

- .1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .2 Where indicated on the drawings, place geotextiles free wrinkles and support until covered with aggregate. Provide a minimum overlap of 1 m.
- .3 Carefully place stone uniformly to the sizes as indicated on the Contract Drawings.
- .4 Do not drop the stone from excessive heights. End dumping of aggregate is not permitted
- .5 Generally work from the lower elevations and working progressively up the slope. Place materials according to the accepted Aggregate Placement Procedures.
- .6 Divers shall coordinate placement of rock, ensure even coverage and protect against displacement of fabric during rock placement.

3.3 CLEANING

- .1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .2 Promptly as the work proceeds and upon completion, clean-up and remove from the site, rubbish and surplus material resulting from the Work of this Section.

PART 1 - GENERAL

- 1.1 SCOPE .1 This Section covers Work related to excavation, trenching and backfilling.
- 1.2 MEASUREMENT PROCEDURES .1 Excavation, regrading, and legal disposal of fill (as required) will be considered as part of the Lump Sum arrangement.
- 1.3 RELATED REQUIREMENTS .1 Section 01 74 21 - Construction / Demolition Waste Management and Disposal.
.2 Section 02 41 16 - Structure Demolition.
.3 Section 31 05 16 - Aggregate Materials.
- 1.5 WASTE MANAGEMENT AND DISPOSAL .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

- 2.1 MATERIALS .1 Refer to Section 31 05 16 - Aggregate Materials.

PART 3 - EXECUTION

- 3.1 UTILITY LOCATES .1 Before commencing work, establish location and extent of underground utility lines in area of excavation. Notify Departmental Representative of findings.
.2 Arrange for and de-energize existing lighting. Retain, protect and support, as required, existing conduit and lines.
.3 Record and submit the locations of all lines.

3.2 EXCAVATION

- .1 Excavate existing fill material as required.
- .2 Dispose of surplus and unsuitable excavated material off site.

3.3 BACKFILLING

- .1 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .2 Place backfill all spaces not occupied by parts of the structure, or other permanent works, with specified material, placed as shown on the drawings
- .3 Place Granular A materials in areas as indicated. Place material in uniform layers not exceeding 200 mm compacted thickness up to grades indicated and be uniformly compacted to at least 98% SPMDD.
- .4 Backfill not explicitly identified on the drawings shall be Granular A.

3.4 VOIDS

- .1 When approved by Departmental Representatives, install Clear Stone into voids or cavities in the existing timber crib structure.

PART 1 - GENERAL

1.1 SCOPE

- .1 This Section covers Work related to miscellaneous metal fabrications such as pile caps, curb rails, ladders, marine bollards and sheet pile repairs.

1.2 MEASUREMENT PROCEDURES

- .1 Pile caps will be measured by length in linear metres of cap installed, as calculated from neat dimensions measured on-site along the centerline of cap.

.1 Splices, support plates, field welding and finishing shall be considered included in the unit price of caps and will not be measured separately for payment.

- .2 Curb rail will be measured by length in linear metres of rail installed, as calculated from neat dimensions measured on-site along the centerline of rail.

.1 Splices, support plates, anchors, field welding and finishing shall be considered included in the unit price of the rails and will not be measured separately for payment.

.2 There will be no distinction made in the payment of the item for the section of curb rail anchored directly to concrete.

- .3 Safety ladders will be measured by the number of units installed.

.1 Anchors, connections, field welding and finishing shall be considered included in the unit price of ladders and will not be measured separately for payment.

- .4 Miscellaneous Sheet Pile Repairs will be measured per repair completed.

- .5 The large single sheet pile repair detailed on the Contract Drawings will be paid for in the lump sum arrangement.

- .6 Bollards will be measured by the number of units installed.

.1 Anchors, connections, concrete, reinforcing steel and finishing shall be considered included in the unit price of bollards and will not be measured separately for payment.

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- .7 Payment at the Contract price of unit rate tender items shall be full compensation for all labour, equipment and material to do the work, including touch-up of finishes.
- 1.2 RELATED REQUIREMENTS
- .1 Section 03 30 00 - Cast-In-Place Concrete
- .2 Section 12 41 16 - Structure Demolition.
- 1.2 REFERENCES
- .1 Canadian Standards Association
- .1 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CSA Standard S16.1-14
- .3 CSA W47.1-09 (R2014), Certification of Companies for Fusion Welding of Steel Structures.
- .4 CSA W59-2018, Welded Steel Construction (Metal Arc Welding).
- .2 The Society for Protective Coatings (SSPC)
- .1 SSPC-SP 2-82(R2004), Hand Tool Cleaning.
- .2 SSPC-SP 6/NACE No. 3-07, Commercial Blast Cleaning.
- .3 SSPC-Vis-1-89, Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs) Editorial Changes September 1, 2000 (Steel Structures Painting Manual, Chapter 2 - Surface Preparation Spec.).
- .4 SSPC-PA 2-04, Measurement of Dry Coat Thickness with Magnetic Gauges.
- .5 SSPC Good Painting Practices, Volume 1, 4th Edition.
- 1.3 SUBMITTALS
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
- .1 Prior to fabrication, submit fabrication shop drawings with general layout, detailed dimensions, welding details, fastener details and all other relevant information necessary for fabrication.
- .2 Submit manufacturer's instructions, printed product literature and data sheets for paint, MSDS sheets, surface preparation requirements, application temperature / conditions, finish and limitations.

- .3 Submit manufacturer's instructions and product data sheets for dowels into concrete, including required equipment list.
- .4 Submit finishing system including detailed product data sheet, manufacturer's recommendations for surface preparation and other relevant data for each component.
- .3 Provide a detailed schedule for fabrication and coating work.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Structural steel for rolled sections: to CSA Standard G40.21, Grade 350W.
- .2 Structural steel for plates and miscellaneous steel: to CSA Standard G40.21, Grade 300W.
- .3 Paint for steel components: ultra-durable solvent-free, self-priming, Polyamido-Amine Epoxy coating - Carboguard 1207 by Carboline, or approved equal, meeting the following requirements.
 - .1 Marine grade
 - .2 Volume solids content: 98% ± 2%
 - .3 Dry Film Thickness: 2 coats x 80 mils.
 - .4 Dark Grey (or Safety Yellow for ladders)
 - .5 Surface profile for abrasive blasting to SSPC-SP10 with 3 - 4 mils surface profile
- .4 Where specified, hot dipped galvanizing shall be according to ASTM A123.
- .5 For drilled in anchors and cast anchorages into concrete, see Section 03 33 00.

PART 3 - EXECUTION

3.1 STEEL FABRICATION

- .1 Fabricate steel components as detailed on drawings and weld according to CSA W59.
- .2 All flame cut edges shall be as smooth and regular as those produced by edge planing and shall be free of slag.
- .3 Surfaces to be welded shall be smooth, uniform and free from birs, fins and other defects which would

adversely affect the quality and uniformity of the weld.

- .4 Notify Departmental Representative of fabrication and coating schedules. Allow sufficient time for the Departmental Representative to inspect the fabricated components prior to coating work.

3.2 PILE CAPS AND CURB RAILING

- .1 Prior to fabrication, field measure the site to ensure that the fabrication of the pile caps and curb railing is suitable.
- .2 Fabricate as detailed on drawings and shop apply coatings (see Parts 3.5 and 3.6).
- .3 Install steel pile caps and curb rails and field weld to sheet piling as indicated on the drawings. Where the cap is not fully supported on the sheet piles due low cutoff elevations, weld angles for support and connection to sheeting.
- .4 Drill and anchor portion of curb rail on concrete where indicated on the drawings.
- .5 Touch up coating on pile caps damaged by handling and installation.

3.2 SAFETY LADDERS

- .1 Prior to fabrication, field measure each proposed location for ladders and modify dimensions or details to suit.
- .2 Fabricate as detailed on drawings.
- .3 Hot dip galvanize the ladders. Prior to the application of the safety yellow paint on the vertical leg of the ladder, lightly sand and solvent wash the galvanized surface. Shop apply the paint coating.
- .4 Install the ladders and field weld to sheet piling as indicated on the drawings.
- .5 Touch up coating on pile caps damaged by handling and installation.

3.3 SHEET PILE REPAIRS

- .1 Prior to fabrication of the bent plate, field measure the single large repair area and modify dimensions or details to suit.
- .2 Supply six 200 mm x 300 mm x 6 mm steel plates for miscellaneous repairs.

- .3 Field weld the plate repair areas with continuous fillets welds.

3.4 BOLLARDS

- .1 Fabricate as detailed on drawings.
- .2 Hot dip galvanize (exterior and interior surfaces). Coordinate and place openings in the bollard for galvanizing in locations which will not impact the aesthetics or durability of the bollard.
- .3 For the requirements of concrete construction and grout, see Section 03 33 00.
- .4 Touch up galvanized coatings with zinc-rich paint.

3.5 PAINTING PREPARATION

- .1 Clean surfaces of metal to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and foreign substances in accordance with SSPC-SP10 Near-White Metal Blast Cleaning.
- .2 Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes, by blowing with clean dry compressed air, or by vacuum cleaning.

3.6 PAINTING APPLICATION

- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Paint shall be applied by spray, brush, or roller. All paint work shall be completed in the shop.
- .3 Apply each coat of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .4 Allow 21 days for coating curing or according to the Manufacturer's recommendations if greater.
- .5 Handling painted metal:
 - .1 Handle painted metal after paint has dried, or when necessary for handling for painting or stacking for drying.
 - .2 Scrape off and touch up paint which is damaged in handling, with same number of coats and kinds of paint as were previously applied to metal.