
CCGB Parry Sound	SPECIFICATION	Section 00 00 00
Floating Dock Repairs	TITLE SHEET	Page 1
Project No. R.079829.001		2017-03-31

PROJECT TITLE Parry Sound, Ontario
 CCGB Parry Sound
 Floating Dock Repairs

PROJECT NUMBER R.079829.001

PROJECT DATE 2017-03-31

DESIGN ENGINEER: Philip Lampkin P.Eng., Riggs Engineering Ltd.



<u>Section</u>	<u>Title</u>	<u>Pages</u>
<u>Division 00 - Procurement and Contracting Requirements</u>		
00 00 00	SPECIFICATION TITLE SHEET	1
00 01 07	SEALS PAGE	1
<u>Division 01 - General Requirements</u>		
01 11 02	GENERAL INSTRUCTIONS CIVIL	7
01 33 00	SUBMITTAL PROCEDURES	6
01 35 29	HEALTH AND SAFETY REQUIREMENTS	6
01 35 43	ENVIRONMENTAL PROCEDURES	6
01 52 00	CONSTRUCTION FACILITIES	4
01 74 20	CONSTRUCTION/DEMOLITION WASTE MANAGEMENT AND DISPOSAL	5
<u>Division 02 - Existing Conditions</u>		
02 41 14	DEMOLITION AND REMOVALS	4
<u>Division 03 - Concrete</u>		
03 30 00	CAST-IN-PLACE CONCRETE	7
<u>Division 05 - Metals</u>		
05 12 35	WELDING	4
<u>Division 06 - Wood, Plastics, and Composites</u>		
06 05 73	WOOD TREATMENT	3
<u>Division 31 - Earthwork</u>		
31 23 11	EXCAVATING AND BACKFILLING	3
<u>Division 32 - Exterior Improvements</u>		
32 12 17	ASPHALTIC CONCRETE PAVING	5
<u>Division 33 - Utilities</u>		
33 11 16	SITE WATER UTILITY DISTRIBUTION PIPING	13
<u>Division 35 - Waterway and Marine Construction</u>		
35 51 15	FLOATS AND RAMPS	6
35 51 16	FLOAT ANCHOR BLOCKS	2

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 as directed by the Departmental Representative.
 - .2 Rules and regulations of authorities having jurisdiction.
 - .3 Treasury Board of Canada Secretariat, Fire Protection Standard, April 1, 2010.
 - .4 Observe and enforce construction safety measures required by National Building Code 2015, Part 8 Safety Measures at Construction and Demolition Sites, 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, O. Reg. 143/99, O. Reg. 571/99, O. Reg. 145/00, O. Reg. 527/00, R.R.O. 1990, Reg. 834, O. Reg. 278/05 (Asbestos), Workplace Safety and Insurance Board and municipal statutes and authorities.
 - .5 Environmental Protection Act, O. Reg. 102/94 and O. Reg. 103/94.
 - .6 Ontario Regulation 634/86 for Diving Operations.
- 1.2 PRECEDENCE .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Specification.
- 1.3 TAXES .1 Pay applicable Federal, Provincial and Municipal taxes.
- 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 when requested.

1.5 EXAMINATION

- .1 Before submitting tender, examine existing conditions and determine conditions affecting work.
- .2 Obtain all information which may be necessary for proper execution of Contract.

1.6 SITE

- .1 Confine work, including temporary structures, plant, 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.

1.7 CONSTRUCTION & STORAGE AREA

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

1.8 DOCUMENTS

- .1 Keep on site one copy of all contract documents and reviewed shop drawings.
- .2 Maintain documents in clean, dry, legible condition.
- .3 Make Documents available at all times for inspection by Departmental Representative.

1.9 MEASUREMENT PROCEDURES

- .1 Items measured for payment are in metric (SI) units.
 - .2 Submit requests for payment in metric units corresponding with items on the Unit Price Table.
-

- .3 Submit supporting documents in metric units.
Perform all necessary conversions required.

1.10 COST BREAKDOWN

- .1 Within one week of notification of acceptance of tender furnish a cost breakdown.
- .2 Submit breakdown in metric (SI) units.

1.11 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 can not be identified by visual inspection.
- .4 Turn one set of As-Built Record Drawings over to Departmental Representative on completion of work.
- .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.

1.12 SHOP DRAWINGS

- .1 To Section 01 33 00.
-

- 1.13 ADDITIONAL DRAWINGS
- .1 Departmental Reresentative may furnish additional drawings to clarify work.
 - .2 Such drawings become part of Contract Documents.
- 1.14 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. Include marine access points.
 - .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.
- 1.15 CO-OPERATION & PROTECTION
- .1 Execute work with minimum disturbance to occupants, public and normal use of site. Make arrangements with Departmental Reresentative to facilitate execution of work.
 - .2 Maintain access and exits.
 - .3 Provide necessary barriers, warning lights and signs. Protect work from damage. Replace damaged existing work with material and finish to match original.
 - .4 Provide final protection and maintain conditions that ensure installed work is without damage or deterioration at time of Substantial Performance.
 - .5 Use equipment and procedures that prevent damage to existing structures.
 - .6 Work shall be conducted in a manner to protect the stability of structures on or adjacent to the existing structures, roads or other facilities damaged or fouled by work. Complete repairs and clean up at no additional expense to the Contract. Repairs made to damaged existing work to equal or better condition.
-

- 1.16 EXISTING UTILITIES
- .1 Establish location, protect and maintain existing utility lines.
 - .2 Connect to existing utilities with minimum disturbance to pedestrian and vehicular traffic.
- 1.17 MATERIAL AND EQUIPMENT
- .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.
- 1.18 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.
- 1.19 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.
- 1.20 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.

1.21 PROGRESS
PHOTOGRAPHS

.1 As soon as work commences, take monthly progress photographs.

.2 View points, which will best illustrate progress of work, will be selected by Departmental Representative.

.3 Digital progress photographs shall be sent to the Departmental Representative on a weekly basis.

1.22 DATUM

.1 Elevations and soundings shown on Drawings are expressed in metres relative to chart datum.

.2 Chart datum for Lake Huron is 74.2 metres I.G.L.D (1985).

.3 Water Level Chart, for Lake Huron is shown on Drawing MA-00.

1.23 CONSTRUCTION
PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

.3 Build and maintain temporary roads where indicated or directed by Departmental Representative and provide snow removal during period of Work.

.4 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

.5 Clean construction runways and taxi areas where Contractor's equipment.

1.24 SECURITY .1 Pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

.2 Be Responsible for site security at all times.

.3 Entry and egress point shall be secured during non-working hours.

1.25 DEMOBILIZATION .1 Complete demobilization of equipment no later than two weeks after receiving Departmental Representative's written release from work. Do not leave equipment on job site.

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 Do not proceed with Work affected by submittal until review is complete.
 - .3 Present shop drawings, product data and samples in SI Metric units.
 - .4 Where items or information is not produced in SI Metric units converted values are acceptable.
 - .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
 - .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
 - .7 Verify field measurements and affected adjacent Work are co-ordinated.
 - .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
 - .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
-

- .10 Keep one reviewed copy of each submission on site.
- .11 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as pdf files. Forward pdf, and Autocad dwg files on USB or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.2 SHOP DRAWINGS
AND PRODUCT DATA

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

- .7 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.

 - .8 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.

 - .9 After Departmental Representative's review, distribute copies.

 - .10 Submit three hard copies and one electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

 - .11 Submit three hard copies and one electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
-

- .12 Submit three hard copies and one electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.

 - .13 Submit three hard copies and one electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.

 - .14 Submit three hard copies and one electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

 - .15 Submit three hard copies and one electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

 - .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

 - .17 Submit three hard copies and one electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

 - .18 Delete information not applicable to project.
-

- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .21 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that 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 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
 - .2 Deliver samples prepaid to Departmental Representative's business address upon request.
 - .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
-

- .4 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .5 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.4 CERTIFICATES
AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.
- .2 Submit transcription of insurance immediately after award of Contract.

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 Canadian Standards Association (CSA): Canada
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .2 National Building Code 2010 (NBC):
 - .1 NBC 2015, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
 - .3 National Fire Code 2010 (NFC):
 - .1 NFC 2015, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.
 - .4 Province of Ontario:
 - .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
 - .2 O. Reg. 490/09, Designated Substances.
 - .3 Workplace Safety and Insurance Act, 1997.
 - .4 Municipal statutes and authorities.
 - .5 Treasury Board of Canada Secretariat (TBS):
 - .1 Treasury Board, Fire Protection Standard April 1, 2010 www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316§ion=text.
- 1.2 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Submit in accordance with Section 01 33 00.
 - .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
 - .3 Measures and controls to be implemented to address identified safety hazards and risks.
 - .3 Contractor's and Sub-contractors' Safety Communication Plan.
-

- .4 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 7 days after receipt of comments from Departmental Representative.
- .5 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.
- .6 Submit names of personnel and alternates responsible for site safety and health.
- .7 Submit records of Contractor's Health and Safety meetings when requested.
- .8 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, upon request.
- .9 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
- .10 Submit copies of incident and accident reports.
- .11 Submit Material Safety Data Sheets (MSDS).
- .12 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.

1.3 FILING OF NOTICE

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

1.4 WORK PERMIT

- .1 Obtain building permits related to project prior to commencement of Work.

1.5 SAFETY ASSESSMENT

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

- 1.6 MEETINGS .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
- 1.7 REGULATORY REQUIREMENTS .1 Comply with the Acts and regulations of the Province of Ontario.
- .2 Comply with specified standards and regulations to ensure safe operations at site.
- 1.8 PROJECT/SITE CONDITIONS .1 Work at site will involve contact with:
- .1 Silica in concrete.
- .2 Mould on timber crib.
- .3 Work at or near water
- 1.9 GENERAL REQUIREMENTS .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.
- .3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.
- 1.10 COMPLIANCE REQUIREMENTS .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.
-

- 1.11 RESPONSIBILITY .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act and Regulations for Construction Projects for the Province of Ontario.
- 1.12 UNFORSEEN HAZARDS .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.
- 1.13 POSTING OF DOCUMENTS .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Ontario, and in consultation with Departmental Representative.
- .1 Contractor's Safety Policy.
- .2 Constructor's Name.
- .3 Notice of Project.
- .4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
- .5 Ministry of Labour Orders and reports.
- .6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
- .7 Address and phone number of nearest Ministry of Labour office.
- .8 Material Safety Data Sheets.
-

- .9 Written Emergency Response Plan.
- .10 Site Specific Safety Plan.
- .11 Valid certificate of first aider on duty.
- .12 WSIB "In Case of Injury At Work" poster.
- .13 Location of toilet and cleanup facilities.

1.14 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 POWDER
ACTUATED DEVICES

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

1.17 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor'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 humans; or degrade environment aesthetically, culturally and/or historically.
 - .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.
- 1.2 SUBMITTALS
- .1 Submit in accordance with Section 01 33 00.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets upon request and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS.
 - .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.
 - .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
 - .5 Address topics at level of detail commensurate with environmental issue and required construction tasks.
 - .6 Include in Environmental Protection Plan:
 - .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 indicating 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.

.1 Plans to include measures to minimize amount of material transported onto paved public 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.

.1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan to include 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.

1.3 WORK ADJACENT
TO WATERWAYS

.1 Construction equipment to be operated on land only.

.2 Do not use waterway beds for borrow material.

- .3 Do not allow stone, gravel, crushed rock, broken concrete and other deleterious substances to enter the waterway unless otherwise indicated.

1.4 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
 - .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
 - .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area by providing temporary enclosures.
 - .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
 - .5 Abide by local noise by-laws.
 - .6 Spills of deleterious substances:
 - .1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.
 - .2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060.
 - .3 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect.
 - .7 Re-fuelling of machinery must take place at a safe distance from the waterway as designated by Departmental Representative.
 - .8 Machinery to arrive on site in a clean, washed condition and maintained free of leaks.
 - .9 Wash, refuel, and service machinery and store fuel and other materials for the machinery away from water to prevent any deleterious substance from entering the water.
 - .10 Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
-

1.5 CONCRETE
OPERATIONS

- .1 The following clauses are applicable to all work under Section 03 30 00.
 - .2 Employ measures to prevent entry of concrete wash water or leachate from uncured concrete into the water.
 - .3 Provide containment facilities at the site for the wash-down water from concrete delivery trucks, concrete equipment, and other tools and equipment as required. Water used to wash concrete should not be allowed to enter directly into water bodies. The sediment should be allowed to settle out and reach neutral pH before the clarified water is released to the drain system or allowed to percolate into the ground.
 - .4 Concrete trucks and concrete equipment shall be washed out in a designated area where runoff to the marine environment, adjacent waterways and storm drains can be prevented.
 - .5 Prior to placement of concrete, all forms shall be thoroughly inspected to ensure that formwork is fully secured and sealed to prevent the release of concrete or concrete contaminated water into the waterway.
 - .6 If escape of concrete is observed or detected, pumping and or placement should be stopped and appropriate action taken to immediately rectify the situation.
 - .7 Measure and record baseline pH levels in the project area prior to commencement of work.
 - .8 Prior to the commencement of operations, demonstrate satisfactory knowledge and use of pH monitoring equipment to Departmental Representative.
 - .9 Monitor the pH levels frequently in the waterway immediately downstream of isolated work site until completion of work. Emergency measures shall be taken if pH change more than 1.0 pH unit, measured to an accuracy of 0.2 pH units from the background level or is recorded to be below 6.0 or above 9.0 pH units.
-

- .10 The pH levels are to be maintained within the range of 6.5-8.5 as per Provincial Water Quality Objectives (PWQO).
- .11 Keep a carbon dioxide (CO₂) tank with regulator, hose and gas diffuser readily available during concrete work. Use it to release carbon dioxide gas into the affected area to neutralize pH levels should a spill occur. Train workers to use the tank.

1.6 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 Take action only 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 Leave Work area clean at end of each day.
-

- .2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

PART 1 - GENERAL

- 1.1 REFERENCES .1 U.S. Environmental Protection Agency (EPA)/
Office of Water
.1 EPA 833-R-06-004, May 2007, Developing Your
Stormwater Pollution Prevention Plan - A Guide
for Construction Sites.
- 1.2 SUBMITTALS .1 Provide submittals in accordance with Section
01 33 00.
- 1.3 INSTALLATION
AND REMOVAL .1 Prepare site plan indicating proposed location
and dimensions of area to be fenced and used by
Contractor, number of trailers to be used,
avenues of ingress/egress to fenced area and
details of fence installation.
- .2 Identify areas which have to be gravelled to
prevent tracking of mud.
- .3 Indicate use of supplemental or other staging
area.
- .4 Provide construction facilities in order to
execute work expeditiously.
- .5 Remove from site all such work after use.
- 1.4 PROVISIONS .1 Provide a clearly marked and fully stocked
first-aid case in a readily available location.
- .2 Provide private washroom facilities complete
with flush or chemical type toilet, lavatory and
mirror and maintain supply of paper towels and
toilet tissue.
- 1.5 SITE
STORAGE/LOADING .1 Confine work and operations of employees to
areas defined by Contract Documents. Do not
unreasonably encumber premises with products.
-

- .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.6 CONSTRUCTION PARKING .1 To Section 01 11 02

1.7 SECURITY .1 To Section 01 11 02.

1.8 CONTRACTOR'S OFFICES .1 Provide a suitable furnished temporary office for its own use.

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.

1.11 PROTECTION AND MAINTENANCE OF TRAFFIC .1 Provide access and temporary relocated roads as necessary to maintain traffic.

- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

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

1.12 CLEAN-UP

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

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 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 and sediment and erosion control drawings and sediment and erosion control plan, specific to site, that complies with EPA 833-R-06-004 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

PART 1 - GENERAL

- 1.1 CONSTRUCTION & DEMOLITION WASTE
- .1 Carefully deconstruct and source separate materials/equipment and divert, from D&C waste destined for landfill to maximum extent possible. Target for this project is 75% diversion from landfill. Reuse, recycle, compost, anaerobic digest or sell material for reuse except where indicated otherwise. On site sales are not permitted.
 - .2 Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.
 - .1 Provide facilities for collection, handling and storage of source separated wastes.
 - .2 Source separate the following waste:
 - .1 Portland cement concrete.
 - .2 Corrugated cardboard.
 - .3 Wood.
 - .4 Steel.
 - .3 Submit a waste reduction workplan indicating the materials and quantities of material that will be recycled and diverted from landfill.
 - .1 Indicate how material being removed from the site will be reused and recycled.
 - .4 Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.
- 1.2 WASTE PROCESSING SITES
- .1 Province of: Ontario.
 - .1 Ministry of Environment, Public Information Centre, 2nd Floor - Macdonal Block, Suite M2-22 - 900 Bay Street, Toronto, ON, M7A 1N3.
 - .2 General Inquiry: 416-325-4000 or 1-800-565-4923 TTY (for persons who are deaf, deafened or hard of hearing).
 - .3 Telephone: 416-326-9236 or 1-800-515-2759.
 - .4 Fax: 416-323-4682.
-

- .2 Recycling Council of Ontario: 215 Spadina Avenue, #225, Toronto, ON, M5T 2C7.
 - .1 Telephone: 416-657-2797.
 - .2 Fax: 416-960-8053.
 - .3 Email: rco@rco.on.ca.
 - .4 Internet: <http://www.rco.on.ca/>.

1.3 STORAGE,
HANDLING AND
PROTECTION

- .1 Unless specified otherwise, materials for removal become Contractor's property.
- .2 Protect, stockpile, store and catalogue salvaged items.
- .3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .4 Protect structural components not removed for demolition from movement or damage.
- .5 Support affected structures.
- .6 Protect surface drainage, mechanical and electrical from damage and blockage.
- .7 Separate and store materials produced during dismantling of structures in designated areas.
- .8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Provide waybills for separated materials.

1.4 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Do not bury rubbish and waste materials on site.
 - .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner, into waterways, onto ground, storm, or sanitary sewers, or in other locations where it will pose health or environmental hazard.
-

- .3 All waste materials shall be disposed of in a legal manner at a site approved by Local Authorities.
 - .4 Provide acceptable containers for collection and disposal of waste materials, debris and rubbish.
 - .5 Do not allow deleterious substances to enter the waterway.
 - .6 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
 - .7 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
 - .8 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
 - .9 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
 - .10 All waste materials including containers and waste fluids associated with vehicle maintenance shall be disposed of in a legal manner at a site approved by Local Authorities.
 - .11 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.
 - .12 Fold up metal banding, flatten and place in designated area for recycling.
 - .13 Divert unused concrete materials form landfill to local quarry approved by Departmental Representative.
 - .14 Divert unused admixtures and additive materials from landfill to official hazardous material collections site as approved by Departmental Representative.
-

- .15 Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
- .16 Prevent admixtures and additive materials from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with inert, noncombustible material and remove for disposal. Dispose of waste in accordance with applicable local, Provincial and National regulations.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 APPLICATION .1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.
 - 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.
 - .3 Source separate materials to be reused/recycled into specified sort areas.
 - 3.3 DIVERSION OF MATERIALS .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.
 - .1 Mark containers or stockpile areas.
 - .2 Provide instruction on disposal practices.
-

- .2 Divert unused paint/coating materials from landfill to official hazardous material collections site approved by Departmental Representative.
- .3 Divert unused metal and wiring materials from landfill to metal recycling facility approved by Departmental Representative.

3.4 CANADIAN
GOVERNMENTAL
DEPARTMENTS CHIEF
RESPONSIBILITY FOR
THE ENVIRONMENT

- .1 Government Chief Responsibility for the Environment.

Province	Address	General Inquiries	Fax
Ontario	Ministry of Environment Public Information Centre 2nd Floor - Macdonal Block, Suite M2-22 900 Bay St., Toronto, ON M7A 1N3	(416) 325-4000 (800) 565-4923 (416) 326-9236 (800) 515-2759	(416) 325-3159

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 35 51 16: Float Anchor Blocks.

1.2 MEASUREMENT PROCEDURES

- .1 Demolition, removal and disposal of existing floating docks will be measured by each floating dock and shall include all labour, materials and equipment necessary to complete the work.
- .2 Demolition, removal and disposal of existing steel gangways will be measured by each gangway and shall include all labour, materials and equipment necessary to complete the work.
- .3 Demolition, removal and disposal of existing concrete head blocks including the concrete approach slabs at each headblock will be measured by each head block and shall include all labour, materials and equipment necessary to complete the work.
- .4 Removal and disposal of existing concrete anchor blocks and chains will be measured by each anchor block and shall include all labour, materials and equipment necessary to complete the work.
- .5 Salvage and reinstallation of salvaged anchor blocks and chains indentified for reuse shall be measured under Section 35 51 16.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
- .2 Sustainable Design Submittals:
 - .1 Construction Waste Management: Submit project Waste Management Plan highlighting recycling and salvage requirements

1.4 WORK

- .1 Dispose legally off the site all demolished and removed materials.
-

1.5 SAFETY CODE .1 Unless otherwise specified, carry out demolition work in accordance with Section 01 74 20 and CSA S350-M1980.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 EXAMINATION .1 Inspect site and verify with Departmental Representative items designated for removal and disposal, items to remain and items to salvage.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Do not disrupt active power and service lines entering existing buildings and wharf outlets as per rules and regulations of authorities having jurisdiction. Post warning signs on electrical lines and equipment which must remain energized to serve navigational equipment during period of demolition and removal.

.4 Notify and obtain approval of utility companies before starting demolition.

.5 Disconnect, cap, plug or divert, as required, existing utilities within the area of work where they interfere with the execution of the work. Complete work in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Maintain pipes and conduits encountered.

.6 Immediately notify Departmental Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.

- .7 Immediately notify Departmental Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

3.2 PROTECTION

- .1 Prevent movement, settlement, or damage to adjacent structures, asphalt pavement, utilities, services, and distribution panels.
- .2 Keep noise, dust, and inconvenience to normal use of the site to a minimum.
- .3 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .4 Prevent movement, settlement or damage of adjacent parts of existing structure to remain. Make good damage and be liable for injury caused by demolition and removal.
- .5 Prevent movement or damage of existing tree and sign to be protected as shown on drawings. Make good damage and be liable for injury caused by demolition and removal.
- .6 If the contractor considers existing tree to be a health and safety risk, obtain Departmental Representative approval before removal of the tree at no additional cost. Contractor will be responsible for replanting of replacement trees as approved by Departmental Representative.

3.3 DEMOLITION AND REMOVALS

- .1 Completely demolish and remove existing concrete head blocks and approach slabs at float string #1 and float string #2 as indicated on the drawings and provide any temporary barriers required to prevent any removed materials from polluting the waterway and dispose off site.
- .2 Remove all existing floating docks, ramps, and associated sections at float string #1 and float string #2 as indicated on the drawings in a manner where no debris pollutes the waterway and dispose off site.

- .3 Remove and dispose excess existing chains and anchor blocks as directed. Departmental Representative shall indentify twelve anchor blocks and chains for reuse and reinstallation with new floats. .1Provide 48 hours notice to permit the
Departmental Representative to identify twelve anchor blocks to be salvaged and reused.

3.4 DISPOSAL

- .1 Provide netting to capture/collect all demolished and removed concrete and asphalt, including items not designated to be salvaged. Legally dispose off site in accordance with provincial regulations.
- .2 Disposal in the lake is not permitted.
- .3 Provide waste reduction and disposal plan to Section 01 74 20.

3.5 CLEANING

- .1 Progress cleaning: leave work area clean at the end of each day.
- .2 Final cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .3 Waste management: in accordance with Section 01 74 20.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 23 11: Excavating and Backfilling.

1.2 MEASUREMENT PROCEDURES

- .1 Cast-in-place concrete head blocks will be measured by each head block installed and shall include all labour, materials, and equipment necessary to complete the work.
- .2 Cast-in-place concrete approach slabs at each head block shall be measured by the square metre and shall include all labour, materials, and equipment necessary to complete the work.
- .3 Cast-in-place concrete deck slab over the new water line shall be measured by the square metre and shall include all labour, materials, and equipment necessary to complete the work.
- .4 Excavation and Granular A backfill will be measured under Section 31 23 11.
- .5 Heating water, aggregates, and providing cold weather protection will be considered included in the placing of concrete and will not be measured separately for payment.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International) :
- .1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/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 G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel.
- .2 ASTM International
-

.1 ASTM A582/A582M-12e1, Standard Specification for Free Machining Stainless Steel Bars.

.2 ASTM F593-13ae1, Standard Specification for Stainless Steel Bolts.

.3 ASTM A1064/A1064M-16b, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 At least 4 weeks prior to beginning Work, inform Departmental Representative of source of fly ash.

.1 Do not change source of fly ash without written approval of Departmental Representative.

.3 At least 4 weeks prior to beginning Work, submit to Departmental Representative samples of following materials proposed for use: curing compound.

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

1.5 QUALITY ASSURANCE

.1 Provide to Departmental Representative, 4 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.1 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

- .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.
- .2 Deviations to be submitted for review by the Departmental Representative.
- .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
- .3 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials in accordance with Section 01 74 20.

PART 2 - PRODUCTS

- 2.1 DESIGN CRITERIA .1 Alternative 1 - Performance: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.
 - 2.2 PERFORMANCE CRITERIA .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.
 - 2.3 MATERIALS .1 Cement: to CAN/CSA-A3001, Type GU.
 - .2 Supplementary cementing materials: with minimum 20% fly ash replacement or slag replacement by mass of total cementitious materials to CAN/CSA-A3001.
 - .3 Aggregates: to CSA A23.1/A23.2
 - .4 Water: to CSA A23.1/A23.2.
 - .5 Admixtures:
 - .1 Air entraining admixture: to ASTM C260/C260M.
-

.2 Chemical admixture: to ASTM C494/C494M. Engineer to approve accelerating or set retarding admixtures during cold and hot weather placing.

.6 Curing compound: to CSA A23.1/A23.2 white and ASTM C309, Type 1-chlorinated rubber Type 1-D with fugitive dye.

.7 Reinforcing bars: to CSA G30.18, Grade 400.

.8 Formwork: to CSA A23.1/A23.2.

.9 Welded steel wire fabric: to ASTM A1064/A1064M, minimum yield strength of 450 MPa.

.10 Other concrete materials: to CSA A23.1/A23.2.

.11 Epoxy: 2 component, solvent free, high modulus moisture insensitive, usable underwater, high strength structural epoxy suitable for use in cracked or uncracked concrete, conforming to ASTM C881 Type I, II, IV and V, Grade 3, Class A, B and C with the following characteristics:

.1 Bond strength: 12.4 MPa at 2 days to ASTM C882.

.2 Compressive strength: 82.7 MPa to ASTM D695.

.3 Tensile strength: 49.3 MPa at 7 days to ASTM D638.

.4 Water absorption: 0.18% to ASTM D570.

2.4 MIXES

.1 Alternative 1 - Performance Method for specifying concrete: to meet Departmental Representative performance criteria to meet Engineer performance criteria to CSA A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in PART 3 - VERIFICATION.

.2 Provide concrete mix to meet following plastic state requirements:

.1 Uniformity: to CSA A23.1/A23.2.

.2 Workability: free of surface blemishes, loss of mortar, colour variations, and segregation.

.3 Finishability: minimal amount of bleeding.

.3 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: C-1.

.2 Compressive strength at 28 days: 35 MPa minimum.

.3 Intended application: new concrete head blocks and new concrete approach slabs.

.4 Aggregate size 19 mm maximum.

.5 Volume stability: acceptable volume change range due to shrinkage, creep and freeze thaw cycle.

.6 Pre-qualification: yes.

.7 Top surface texture: coarse broom finish.

.4 Concrete supplier's certification: both batch and plant materials to meet CSA A23.1/A23.2.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Provide Departmental Representative 24 hours notice before each concrete pour.

.2 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of rehandling, and without damage to existing structure or Work.

.3 Protect previous Work from staining.

.4 Clean and remove stains prior to application of concrete finishes.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature, and test samples taken.

.7 Do not place load upon new concrete until authorized by Departmental Representative.

- .8 Prior to placing of concrete, obtain Engineer's approval of proposed method of protection of concrete during placing and curing.

3.2 PLACING
REINFORCEMENT

- .1 Accurately place reinforcing steel to spacings shown on drawings and secure firmly during placing, compacting, and setting of concrete in accordance with CSA A23.1/A23.2.
- .2 Tie reinforcement bars at each cross over point.
- .3 Reinforcement and bars must be in place and inspected by Engineer prior to placing concrete.
- .4 Ensure cover of reinforcement is maintained during concrete placement.

3.3 INSTALLATION/
APPLICATION

- .1 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2.
- .2 Sleeves and inserts:
 - .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, water stops, joint fillers and other inserts required to be built-in.
 - .2 Sleeves and openings greater than 100 mm x 100 mm not indicated, must be reviewed by Departmental Representative.

3.4 FINISHES

- .1 Formed surfaces exposed to view: sack rubbed finish in accordance with CSA A23.1/A23.2.
- .2 Headblocks and approach slabs and deck slabs and exposed site concrete:
 - .1 Screed to plane surfaces and use aluminum magnesium wood floats.
 - .2 Provide round edges and joint spacings using standard tools.
 - .3 Trowel smooth to provide lightly brushed non-slip finish.

- 3.5 CONTROL JOINTS .1 Cut and Form control joints in slabs at pre-existing locations, to CSA A23.1/A23.2 and install specified joint sealer/filler.
- 3.6 EXPANSION AND ISOLATION JOINTS .1 Install premoulded joint filler in pre-existing expansion and isolation joints full depth of slab flush with finished surface to CSA A23.1/A23.2.
- 3.7 CURING .1 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and to CSA A23.1/A23.2.
- 3.8 FIELD QUALITY CONTROL .1 Concrete testing: to CSA A23.1/A23.2 by testing laboratory designated and paid for by Departmental Representative.
- 3.9 CLEANING .1 Clean in accordance with Section 01 74 11.
- .2 Use trigger operated spray nozzles for water hoses.
- .3 Designate cleaning area for tools to limit water use and runoff.
- .4 Cleaning of concrete equipment to be done in accordance with Section 01 35 43.
- .5 Waste Management: separate waste materials for reuse and recycling.
- .1 Provide appropriate area on job site where concrete trucks and be safely washed.
- .2 Divert admixtures and additive materials from landfill to approved official hazardous material collections site after receipt of written approval from Departmental Representative.
- .3 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

PART 1 - GENERAL

- 1.1 REFERENCES .1 Canadian Standards Association (CSA International):
- .1 CSA W47.1-R2014, Certification of Companies for Fusion Welding of Steel.
 - .2 CSA W47.2, Certification of Companies for Fusion Welding of Aluminum.
 - .3 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
 - .4 CSA W59.2-M1991 (R2013) - Welded Aluminum Construction.
- 1.2 WELDER QUALIFICATIONS .1 Use only welders qualified under CSA W47.1 and CSA W47.2.
- .2 Make available to Departmental Representative currently valid Canadian Welding Bureau Qualification Certificate for each welder employed on the work.
- 1.3 MEASUREMENT PROCEDURES .1 Welding will not be measured separately for payment but is considered included in the paid items as specified and indicated.

PART 2 - PRODUCTS

- 2.1 MATERIALS .1 Welding materials to CSA W59 and CSA W59.2.

PART 3 - EXECUTION

- 3.1 WELDING GENERAL .1 Welding: to CSA W59 and CSA W59.2.
- .2 Do not deviate the size, length and location of welds from the design or from details shown on reviewed shop drawings without approval of Departmental Representative.
- .3 Grind flush all butt welds.
-

3.2 PREPARATION

- .1 Surfaces to be welded shall be smooth, uniform and free from fins, tears and other defects which would adversely affect the quality of the weld.
- .2 Ensure areas within 50 mm of the weld are free from loose scale, slag, rust, grease, moisture, paint or other matter which would impair the quality of the weld.
- .3 Remove slag before welding over previously deposited metal and brush clean weld and adjacent base. This requirement applies to successive layers, successive beads and to crater area when welding is resumed after any interruption.
- .4 Before welding is started from the second side remove to sound metal the root of the initial weld of all butt welds except when produced with the aid of backing. Thoroughly fuse the weld metal with the backing in all butt welds made with the use of backing of the same material as the base metal.

3.3 ASSEMBLY

- .1 Bring members to be welded into correct alignment and hold securely in position until the joint has been welded.
- .2 Carefully align abutting parts joined by butt welds.
- .3 Weld in a sequence that will balance the effects of applied heat of welding on various sides as the welding progresses.

3.4 WELD QUALITY

- .1 Weld metal to be sound throughout with no porosity or cracks on the surface of any weld or weld pass.
 - .2 Ensure complete fusion between the weld metal and the base metal and between successive passes throughout the joint.
 - .3 Welds shall be free from overlap and the base metal free from undercutting.
-

- .4 Fill all craters to the full cross section of the welds.
- .5 Fill and grind to profile any craters at the extreme ends of fillet welds.

3.5 TESTING

- .1 Give Departmental Representative 48 hours notice of when work is ready for inspection.
- .2 All welds will be subject to visual inspection requirements of CSA W59 and CSA W59.2.
- .3 Welds which fail the visual inspection will be subject to further nondestructive testing. This testing may be either radiographic or ultrasonic. The full length of the weld will be examined.
- .4 If more than 50% of the welds fail the visual inspection requirements all welds will be tested by nondestructive testing methods.
- .5 Pay all costs for nondestructive testing resulting from visual inspection failure.
- .6 Departmental Representative will not approve any weld until all required inspection is completed, found acceptable and marked as such.

3.6 ACCEPTANCE REQUIREMENTS

- .1 Welds subject to nondestructive testing unacceptable if:
 - .1 There is any imperfection within 25 mm from the beginning or end of a butt weld.
 - .2 There is any type of crack, tear, zone of incomplete fusion or incomplete penetration regardless of size and location.
 - .3 Inclusion:
 - .1 Occurs in any 25 mm of a welded joint containing two or more inclusions where the sum of the greatest dimensions of those inclusions exceed 5 mm;
 - .2 Is greater than one-third the joint thickness but in no case larger than 19 mm.

- .2 Repair defective welds by chipping, air-arc gouging or grinding out from one side or both sides. Remove all traces of defects before rewelding. Remove all traces of oxidation after air-arc gouging.
- .3 Resubmit all repaired welds to nondestructive testing.

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 American Wood-Preservers' Association (AWPA)
 - .1 AWPA M2-15, Standard for Inspection of Treated Wood Products.
 - .2 AWPA M4-15, Standard for the Care of Preservative-Treated Wood Products.
 - .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.
 - .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-O80 Series-15, Wood Preservation.
 - .2 CSA O80.20-1.1-15, This Standard applies to the fire-retardant treatment of lumber by pressure processes.
 - .3 CSA O80.27-1.1-15, This Standard covers the fire-retardant treatment of Douglas Fir, hardwood, softwood, and Poplar plywood by pressure processes.
 - .4 CSA O80.201-15, This Standard covers hydrocarbon solvents for preparing solutions of preservatives.
 - .5 CSA O322-15, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.
 - .4 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
 - .1 SCAQMD Rule 1113-04, Architectural Coatings.
- 1.2 SUBMITTALS
- .1 Submit Submittal submissions: in accordance with Section 01 33 00.
 - .2 Quality assurance submittals:
 - .1 Submit certificates in accordance with Section 01 33 00.
 - .2 For products treated with preservative fire-retardant by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
-

.1 Information listed in AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.

.2 Moisture content after drying following treatment with water-borne preservative fire-retardant.

.3 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

1.3 QUALITY ASSURANCE

- .1 Plant inspection of products treated with preservative and fire-retardant by pressure impregnation will be carried out by designated testing laboratory to AWPA M2, and revisions specified in CAN/CSA-O80 Series, Supplementary Requirements to AWPA M2.
- .2 Each piece of lumber and plywood for preserved wood foundations to be identified by CSA 0322 certified stamp.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Preservative treatment: Alkaline Copper Quaternary (ACQ) Type C.

PART 3 - EXECUTION

3.1 APPLICATION: PRESERVATIVE

- .1 Treat indicate material to CAN/CSA- O80 Series indicate commodity standard number using preservative to obtain minimum net retention of 6.4kg/m³ of wood.
- .2 Following water-borne preservative treatment, dry material to maximum moisture content of 19%.

PART 1 - GENERAL

1.1 MEASUREMENT
PROCEDURES

- .1 Excavation, backfill and compaction of native fill is considered incidental to the work and will not be measured separately for payment.
- .2 Supply and placement of Granular A backfill including compaction will be measured by the tonne and shall include all labour, materials and equipment necessary to complete the work.
- .3 Removal and disposal of unsuitable and excess native fill is considered incidental and will not be measured separately for payment.

1.2 UTILITY LINES

- .1 Before commencing work, establish location and extent of underground utility lines in area of excavation. Notify Departmental Representative of findings.
- .2 Advise Departmental Representative to re-route existing lines in area of excavation. Pay costs of such work.
- .3 Maintain existing lines in areas of excavation which must remain active. Pay costs for this work.
- .4 Record locations of maintained, re-routed and abandoned underground utility lines.
- .5 Make good damage to existing utility lines resulting from work.

1.3 PROTECTION

- .1 Protect excavated earth from freezing by approved method.
 - .2 Grade around excavations to prevent surface water runoff into excavated area.
 - .3 Protect bottoms of excavations from weather. Should softening in bottoms occur due to water or other causes, remove softened soil and replace with unshrinkable fill at no additional cost.
-

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Granular A: to OPS.PROV 1010, April 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material. Maximum size Granular A 19.0 mm.
 - .2 Native fill: soil, free from roots, rocks larger than 75 mm and debris. Departmental Representative to approve excavated material before use as fill.

PART 3 - EXECUTION

- 3.1 STOCKPILING
- .1 Stockpile fill materials in areas designated by Departmental Representative. Stockpile granular materials in manner to prevent segregation.
- 3.2 EXCAVATING
- .1 Excavate to elevations and dimensions indicated or required for construction of work.
 - .2 Make excavation to clean lines to minimize quantity of Granular A backfill material required.
 - .3 Earth bottoms of excavations to be dry undisturbed soil, reasonably level, free from loose or organic matter.
 - .4 Excavation exceeding that shown on drawings, if authorized in writing by Departmental Representative, will be paid as extra to Contract price in accordance with General Conditions. Quantities will be calculated in place, compaction included. Truck load measurements not acceptable.
 - .5 Remove any obstructions encountered in the course of excavation upon approval of Departmental Representative.
 - .6 Dispose of surplus and unacceptable native backfill off site.
-

3.3 EXCAVATION
REQUIRED BY OTHER
SECTIONS

- .1 Excavation for work of other sections is included in this Section and shall be carried out in accordance with provisions specified herein and indicated. This work to be laid out and supervised by trade concerned.

3.4 BACKFILLING

- .1 Do not commence backfilling until areas of work to be backfilled have been inspected and approved by Departmental Representative.
- .2 Backfill all spaces excavated and not occupied by parts of the structure, or other permanent works, with specified material placed as shown on the drawings.
- .3 Areas backfilled to be free from debris, snow, ice, water or frozen ground.
- .4 Prior to placing backfill, compact existing subgrade to obtain same compaction as for specified fill. Cut out "soft" areas and fill with suitable material until specified compaction can be obtained.
- .5 Place and compact native backfill materials in continuous horizontal layers not exceeding 300 mm loose depth. Use methods to prevent disturbing or damaging any part of the work. Make good any damage.
- .6 Maintain optimum moisture content to enable compaction to attain specified density.
- .7 Compact each layer to 95% Standard Proctor Density. Where working space is limited, employ approved mechanical hand operated tamping devices. When such devices are employed, deposit backfill material in layers not exceeding 150 mm in thickness.
- .8 Compact each layer of Granular A backfill to 100% Standard Proctor Density.

PART 1 - GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 31 23 11: Excavating and Backfilling.
- 1.2 PROTECTION
- .1 Protect buildings, landscaping, trench drains, ramps, on site and adjacent property that may be damaged by paving machinery, equipment or personnel. Make good property damaged due to paving operations.
- .2 Take necessary precautions to protect workmen and Parry Sound Coast Guard employees from hazards of paving operations.
- .3 Keep vehicular traffic off newly paved areas until paving properly cured. Do not permit stationary loads on pavement until 24 h after placement.
- 1.3 MEASUREMENT PROCEDURES
- .1 Excavation will be measured in accordance to 31 23 11.
- .2 Granular A base will be measured under Section 31 23 11. Compaction is considered incidental to the work and will not be measured separately for payment.
- .3 Compaction, hauling and water for compaction are considered included in the supplying and placing of aggregates and will not be measured separately for payment.
- .4 Asphalt base course will be measured by tonnes of HL 3 base coarse supplied, placed and compacted and shall include all labour, materials and equipment necessary to complete the work.
- .5 Asphalt surface course will be measured by tonnes of HL 8 surface coarse supplied, placed and compacted and shall include all labour, materials and equipment necessary to complete the work.
-

- .6 Primer is considered included in the asphalt surface course and will not be measured separately for payment.
- .7 Cleaning pavement surfaces is considered included in the asphalt surface course and will not be measured separately for payment.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Asphalt base course: to Ontario Provincial Standard Specification OPSS 1150, November 2010 for type HL 8. Maximum size aggregate 26.5 mm.
- .2 Asphalt surface course: to Ontario Provincial Standard Specification OPSS 1150, November 2010 for type HL 3. Maximum size aggregate 16 mm.
- .3 Primer: emulsified asphalt to Ontario Provincial Standard Specification OPSS 1103, November 2012 for rapid setting type.
- .4 Granular A base: to Section 31 23 11.

PART 3 - EXECUTION

3.1 CLEANING

- .1 Remove dust, contaminants, loose and foreign materials, oil and grease in designated areas.
- .2 Use rotary power brooms supplemented by hand brooming as required.
- .3 Where directed, remove to existing pavement level, sealing compound which has protruded excessively and dispose of removed material as directed.
- .4 Keep drainage system clear of loose and waste materials.

3.2 EXCAVATING

- .1 Excavations to be performed in accordance with 31 23 11.
-

3.3 INSPECTION

- .1 Check graded subgrade for conformity with elevations and cross-sections before placing new Granular A base material.
- .2 Proof-roll subgrade and base surface with mass and type of roller approved by Departmental Representative.
 - .1 Check for unstable areas.
 - .2 Check for areas requiring additional compaction.
- .3 Notify Departmental Representative of unsatisfactory conditions.
- .4 Do not begin paving work until such conditions have been corrected and are ready to receive paving.
- .5 When complete, have Departmental Representative inspect excavations to verify soil bearing capacity, depths and dimensions.
- .6 Excavation, beyond limits shown on drawings, if authorized in writing by Departmental Representative, will be paid for as extra to Contract price in accordance with General Conditions. Quantities will be calculated in place, compaction included. Truck load measurements not acceptable.
- .7 Correct unauthorized excavation at no extra cost by filling with granular A material.

3.4 GRANULAR A BASE

- .1 Place 150 mm compacted thickness of granular A base.
 - .2 Spread each layer uniformly using approved grading equipment and methods.
 - .3 Place material in layers not exceeding 75 mm when compacted.
 - .4 Compact each layer to 100% Standard Proctor Density.
 - .5 Add water as required to maintain material at or near optimum moisture content while compacting.
-

- .6 Finish compacted surface to within 12 mm of established grade as indicated by a 3 m straightedge placed in any direction
- .7 Correct irregularities greater than 12 mm by loosening the surface and adding or removing material until surface is within specified tolerance.

3.5 ASPHALT COURSE

- .1 Place 50 mm of compacted asphaltic concrete base
 - .2 Place 40 mm of compacted asphaltic concrete surface course.
 - .3 Minimum 7°C air temperature when placing mixture.
 - .4 Minimum 118°C mixture temperature when spread.
 - .5 Maximum 149°C mixture temperature at any time.
 - .6 Compact each course with roller when it can support roller mass without undue cracking or displacement.
 - .7 Vibratory roller, power driven, minimum mass 9 tonnes, minimum wheel width 1500 mm.
 - .8 Roll asphalt continuously to density not less than 92% of Maximum Relative Density and not more than 96.5% of Maximum Relative Density.
 - .9 Keep roller speed slow enough to avoid mixture displacement.
 - .10 Moisten roller wheels to prevent mixture adhesion.
 - .11 Compact mixture with hot tampers in areas inaccessible to roller.
 - .12 Finish surface true to grade and free from deviations exceeding 5 mm when measured in any direction with a 3 m straight edge.
 - .13 Finished surface to be free of roller marks.
 - .14 Carefully place and compact hot asphaltic material against joints and catchbasin frames.
-

- .15 Place base course flush to existing pavement surface. Place around catchbasin covers such to permit placement of full thickness asphalt paving overlay.

3.6 JOINTS

- .1 Cut back bituminous course to full depth in straight or curved lines as required to expose fresh vertical surfaces. Remove any broken or loose material.
- .2 Paint exposed edge of asphaltic joints, edges of manholes and catchbasin frames, curbs and similar items with asphalt primer prior to placing asphalt courses.
- .3 Where paving comprises two courses overlap longitudinal joints not less than 600 mm.
- .4 Carefully place and compact hot asphaltic material against joints.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 03 30 00: Cast-in-Place Concrete.
- .2 Section 31 23 11: Excavating and Backfilling.
- .3 Section 32 12 17: Asphaltic Concrete Paving.

1.2 MEASUREMENT PROCEDURES

- .1 Supply and installation of new polyethylene water line including removal of the existing lines shall be measured in metres of pipe installed and shall include all labour materials and equipment necessary to complete the work. Trenching and backfilling required to install the water line is considered included in this item.
 - .2 Supply and installation of new polyethylene water line including removal of the existing water line and asphaltic pavement surface shall be measured in metres of pipe installed and shall include all labour materials and equipment necessary to complete the work. Trenching and backfilling required to install the water line is considered included in this item.
 - .3 Granular A fill, surface and base for new asphaltic concrete pavement shall all be measured under Section 31 23 11.
 - .4 Asphaltic concrete shall be measured under Section 32 12 17.
 - .5 Supply and installation of new polyethylene water line including removal of the existing line and concrete surface shall be measured in metres of pipe installed and shall include all labour materials and equipment necessary to complete the work. Trenching and backfilling required to install the water line is considered included in this item.
 - .6 Supply and placing of a new cast in place concrete deck slab shall be measured under Section 03 30 00.
-

- .7 Measurement for payment will be made measuring horizontally over the ground surface, through valves and fittings, after work is completed.
- .8 All fittings, materials, equipment, and labour necessary to connect to the existing portions of water lines to remain shall be considered incidental to the work and will not be measured separately for payment.
- .9 Pressure testing and disinfection the new water lines shall be considered incidental and will not be measured separately for payment.
- .10 Supply and installation of new blow off valves shall be measured by each unit installed and shall include all labour, materials and equipment necessary to complete the work.
 - .1 Supply and installation of the new valve boxes, new polyethylene risers, concrete blocks, and new riser encasements shall be considered incidental to the item and will not be measured separately for payment.

1.3 REFERENCES

- .1 American National Standards Institute/American Water Works Association (ANSI/AWWA)
 - .1 ANSI/AWWA B300-10, Standard for Hypochlorites.
 - .2 ANSI/AWWA C651-14, Standard for Disinfecting Water Mains.
 - .2 ASTM International (ASTM)
 - .1 ASTM F2620-13, Standard Specification for Heat Fusion Joining of Polyethylene Pipe and Fittings.
 - .3 CSA International (CSA)
 - .1 CAN/CSA-B137 Series-13, Thermoplastic Pressure Piping Compendium. (Consists of B137.0, B137.1, B137.2, B137.3, B137.4, B137.4.1, B137.5, B137.6, B137.8, B137.9, B137.10, B137.11 and B137.12).
 - .1 CAN/CSA-B137.1-13, Polyethylene Pipe, Tubing, and Fittings for Cold-Water Pressure Services.
-

- 1.4 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Submit in accordance with Section 01 33 00.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for new polyethylene water line, all fittings and new blow off valves and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Pipe certification to be on pipe.
- 1.5 CLOSEOUT SUBMITTALS
- .1 Submit data to produce record drawings, including directions for operating valves, list of equipment required to operate valves, details of pipe material, location of air and vacuum release valves, hydrant details.
 - .1 Include top of pipe, horizontal location of fittings and type, valves, valve boxes, valve chambers and hydrants.
 - .2 Operation and Maintenance Data: submit operation and maintenance data for pipe, valves, valve boxes, valve chambers and blow off valves for incorporation into manual.
- 1.6 DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations.
 - .2 Store and protect new polyethylene water main from nicks, scratches, and blemishes
 - .3 Replace defective or damaged materials with new.
- 1.7 SCHEDULING OF WORK
- .1 Schedule Work to minimize interruptions to existing services.
-

- .2 Submit schedule of expected interruptions for approval and adhere to interruption schedule as approved by Departmental Representative.
- .3 Notify Departmental Representative minimum of 24 hours in advance of interruption in service.

1.8 MAINTENANCE
MATERIAL
SUBMITTALS

- .1 Tools: provide tools as follows:
 - .1 One tee-handle operating keys for valves.

PART 2 - PRODUCTS

2.1 PIPE, JOINTS
AND FITTINGS

- .1 High Density Polyethylene pressure pipe:
 - .1 NPS 1/2 to NPS 6: to CAN/CSA-B137.1 type PE 3406, series 160.
 - .2 Polyethylene to polyethylene joints: to be thermal butt fusion joined, to ASTM F2620.
 - .3 Factory insulated pipe complete with integral conduit for electric heat cable and with 1.27 mm black polyethylene jacket with UV inhibitor around insulation.
 - .4 Polyethylene fittings: to CAN/CSA-B137.1. Insulation of joints, fittings and accessories to insulation manufacturer's recommendations.

2.2 TRACER WIRE

- .1 Tracer wire shall be #8 gauge TWU multi-strand copper.
- .2 Splices and other wire to wire connections shall be made by soldering or using waterproof connectors (type to be approved by Departmental Representative) or by using copper split bolt connectors.

2.3 VALVES AND
VALVE BOXES

- .1 Valves to open counter clockwise.
 - .2 Cast iron valve boxes: bituminous coated screw type adjustable over minimum of 450 mm, 250 mm minimum diameter, of such length that when set on valve operating nut top of rod will not be more than 150 mm below cover.
-

.1 Base to be large round type with minimum diameter of 250 mm.

.2 Top of box to be marked "WATER"/"EAU".

2.4 PIPE BEDDING AND SURROUND MATERIAL .1 Granular A: to Section 31 23 11.

2.5 BACKFILL MATERIAL .1 Backfill in accordance with Section 31 23 11.

2.6 RIGID INSULATION .1 High density extruded polystyrene rigid insulation:
.1 Thickness: 50 mm.
.2 Thermal resistance: R-5/25 mm
.3 Compressive strength: 210 kPa.

2.7 ASPHALTIC CONCRETE .1 Asphaltic concrete to Section 32 12 17.

2.8 CAST IN PLACE CONCRETE .1 Cast in place concrete to Section 03 30 00.

2.9 PIPE DISINFECTION .1 Sodium hypochlorite to ANSI/AWWA B300 to disinfect water mains.
.2 Disinfect water mains in accordance with Province of Ontario, Watermain Disinfection Procedure and with ANSI/AWWA C651.

PART 3 - EXECUTION

- 3.1 EXAMINATION .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for distribution piping installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
- 3.2 PREPARATION .1 Clean pipes, fittings, valves, hydrants, and appurtenances of accumulated debris and water before installation.
- .1 Inspect materials for defects to approval of Departmental Representative.
 - .2 Remove defective materials from site as directed by Departmental Representative.
- 3.3 CONCRETE AND ASPHALT PAVEMENT REMOVAL .1 Saw cut full depth of concrete and asphalt pavement to permit trenching for removal of the existing water lines.
- .2 Dispose demolished concrete and asphalt pavement off site.
- 3.4 TRENCHING .1 Do trenching work in accordance with Section 31 23 11.
- .2 Ensure trench depth allows coverage over pipe as indicated in drawings.
 - .3 Trench alignment and depth requires Departmental Representative's approval prior to placing bedding material and pipe.
-

3.5 GRANULAR
BEDDING

- .1 Place Granular A bedding in uniform layers not exceeding 150 mm compacted thickness to depth as indicated.
- .2 Do not place material in frozen condition.
- .3 Shape bed true to grade to provide continuous uniform bearing surface for pipe.
- .4 Shape transverse depressions in bedding as required to suit joints.
- .5 Compact each layer full width of bed.

3.6 PIPE

- .1 Handle pipe by methods recommended by pipe manufacturer. Do not use chains or cables passed through pipe bore so that weight of pipe bears on pipe ends.
 - .2 Lay pipes on prepared bed, true to line and grade.
 - .1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
 - .2 Take up and replace defective pipe.
 - .3 Correct pipe which is not in true alignment or grade or pipe which shows differential settlement after installation greater than 10 mm in 3 m.
 - .3 Face socket ends of pipe in direction of laying. For mains on grade of 2% or greater, face socket ends up-grade.
 - .4 Do not exceed permissible deflection at joints as recommended by pipe manufacturer.
 - .5 Keep jointing materials and installed pipe free of dirt and water and other foreign materials.
 - .1 Whenever work is stopped, install a removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
 - .6 Position and join pipes with equipment and methods approved by Departmental Representative.
-

- .7 Cut pipes in approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
 - .8 Align pipes before jointing.
 - .9 Lay pipe with slack in line.
 - .10 Install gaskets to manufacturer's recommendations. Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
 - .11 Avoid displacing gasket or contaminating with dirt or other foreign material.
 - .1 Remove disturbed or contaminated gaskets.
 - .2 Clean, lubricate and replace before jointing is attempted again.
 - .12 Complete each joint before laying next length of pipe.
 - .13 Minimize deflection after joint has been made.
 - .14 Apply sufficient pressure in making joints to ensure that joint is completed to manufacturer's recommendations.
 - .15 Ensure completed joints are restrained by compacting bedding material alongside and over installed pipes or as otherwise approved by Departmental Representative.
 - .16 When stoppage of work occurs, block pipes in an approved manner to prevent creep during down time.
 - .17 Recheck plastic pipe joints assembled above ground after placing in trench to ensure that no movement of joint has taken place.
 - .18 Do not lay pipe on frozen bedding.
 - .19 Do hydrostatic and leakage test and have results approved by Departmental Representative before surrounding and covering joints and fittings with granular material.
 - .20 Backfill remainder of trench.
-

3.7 VALVE
INSTALLATION

- .1 Install valves to manufacturer's recommendations at locations as indicated.
- .2 Support valves located in valve boxes or valve chambers by means of concrete located between valve and solid ground. Bedding same as adjacent pipe. Maximum length of pipe on each end of valve shall be 1m. Valves not to be supported by pipe.
- .3 Install underground post-type indicator valves as indicated.

3.8 TRACER WIRE

- .1 Install tracer wire in accordance with OPSS and connect on all PVC/HDPE pipe, fittings, etc. to form a continuous loop.
- .2 Test the loop of the tracer wire and demonstrate to Departmental Representative that it functions properly after the backfill has been completed.

3.9 HYDROSTATIC AND
LEAKAGE TESTING

- .1 Do tests in accordance local municipal practices and ANSI/AWWA C651.
 - .2 Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.
 - .3 Notify Departmental Representative at least 48 hours in advance of proposed tests.
 - .1 Perform tests in presence of Departmental Representative.
 - .4 Test pipeline in two sections unless otherwise authorized by Departmental Representative.
 - .5 Upon completion of pipe laying and after Departmental Representative has inspected Work in place, surround and cover pipes between joints with approved granular material placed to dimensions indicated.
 - .6 Leave hydrants, valves, joints and fittings exposed.
-

- .7 When testing is done during freezing weather, protect hydrants, valves, joints and fittings from freezing.
 - .8 Strut and brace caps, bends, tees, and valves, to prevent movement when test pressure is applied.
 - .9 Open valves.
 - .10 Expel air from main by slowly filling main with potable water.
 - .1 Install corporation stops at high points in main where no air-vacuum release valves are installed.
 - .2 Remove stops after satisfactory completion of test and seal holes with plugs.
 - .11 Thoroughly examine exposed parts and correct for leakage as necessary.
 - .12 Apply hydrostatic test pressure on elevation of lowest point in main and corrected to elevation of test gauge, for period of 1 hour in accordance with local municipal practises and 1.5 times the water working pressure at the CCGB Parry Sound service entrance.
 - .13 Examine exposed pipe, joints, fittings and appurtenances while system is under pressure.
 - .14 Remove joints, fittings and appurtenances found defective and replace with new sound material and make watertight.
 - .15 Repeat hydrostatic test until defects have been corrected.
 - .16 Apply leakage test pressure equivalent to the design working pressure at CCGB Parry Sound, after complete backfilling of trench, based on elevation of lowest point in main and corrected to elevation of gauge, for period of 2 hours.
 - .17 Define leakage as amount of water supplied from water metre in order to maintain test pressure for 2 hours.
-

- .18 Do not exceed allowable leakage as established by local municipal practises and pipe manufacturer's literature as established in L/mm of pipe.
- .19 Locate and repair defects if leakage is greater than amount specified.
- .20 Repeat test until leakage is within specified allowance for full length of water main.

3.10 PIPE SURROUND

- .1 Upon completion of pipe laying and after Departmental Representative has inspected Work in place, surround and cover pipes as indicated.
- .2 Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated.
- .3 Place layers uniformly and simultaneously on each side of pipe.
- .4 Do not place material in frozen condition.
- .5 Compact each layer from pipe invert to underside of backfill.

3.11 BACKFILL

- .1 Place backfill material, above pipe surround, in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.
- .2 Do not place backfill in frozen condition.

3.12 FLUSHING AND DISINFECTING

- .1 Flushing and disinfecting operations:
 - .1 Notify Departmental Representative at least 4 days in advance of proposed date when disinfecting operations will begin.
 - .2 Flush water mains through available outlets with a sufficient flow of potable water to produce velocity of 1.5 m/s, within pipe for minimum 10 minutes, or until foreign materials have been removed and flushed water is clear.
-

- .3 Provide connections and pumps for flushing as required.
 - .4 Open and close valves, hydrants and service connections to ensure thorough flushing.
 - .5 When flushing has been completed to Departmental Representative approval, introduce strong solution of chlorine as approved by Departmental Representative into water main and ensure that it is distributed throughout entire system.
 - .6 Disinfect water mains.
 - .7 Rate of chlorine application to be proportional to rate of water entering pipe.
 - .8 Chlorine application to be close to point of filling water main and to occur at same time.
 - .9 Operate valves, hydrants and appurtenances while main contains chlorine solution.
 - .10 Flush line to remove chlorine solution after 24 hours.
 - .11 Measure chlorine residuals at extreme end of pipe-line being tested.
 - .12 Perform bacteriological tests on water main, after chlorine solution has been flushed out.
 - .1 Take samples daily for minimum of 2 days.
 - .2 Should contamination remain or recur during this period, repeat disinfecting procedure.
 - .3 Specialist contractor to submit certified copy of test results.
 - .13 Take water samples at hydrants and service connections, in suitable sequence, to test for chlorine residual.
 - .14 After adequate chlorine residual not less than 50 ppm has been obtained leave system charged with chlorine solution for 24 hours.
 - .1 After 24 hours, take further samples to ensure that there is still not less than 10 ppm of chlorine residual remaining throughout system.
-

3.13 SURFACE RESTORATION .1 After installing and backfilling over water mains, restore surface to original condition as directed by Departmental Representative.

.2 Restore asphaltic concrete pavement in accordance with Section 32 12 17.

.3 Restore cast in place concrete deck in accordance with Section 03 30 00.

3.14 CLEANING .1 Leave work area clean at the end of each day.

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20.

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

PART 1 - GENERAL

- 1.1 RELATED SECTION
- .1 Section 02 41 14: Demolition and Removals.
 - .2 Section 05 12 35: Welding.
 - .3 Section 06 05 73: Wood Treatment.
 - .4 Section 35 51 16: Float Anchor Blocks.

- 1.2 REFERENCES
- .1 ASTM International
 - .1 ASTM A193/A193M-16, Standard Specification for Alloy and Stainless Steel Bolting for High temperature or High Pressure Service and Other Special Purpose Applications.
 - .2 ASTM A240/A240M-16a, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Application.
 - .3 ASTM A269/A269M-14e1, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .4 ASTM A307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .5 ASTM B209M-14, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
 - .6 ASTM B221M-13, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
 - .2 CSA International
 - .1 CSA B111-1974(R2003), Wire Nails, Splikes and Staples.
 - .2 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .3 CSA S16-14, Design of Steel Structures.
 - .4 CAN/CSA-S157-05/S157.1-05(R2015), Strength Design in Aluminum/Commentary on CAN/CSA-S157, Strength Design in Aluminum.
 - .5 CSA W47.2-11, Certification of Companies for Fusion Welding of Aluminum.
 - .6 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.
-

.7 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
.8 CSA W59.2-M1991(R2013), Welded Aluminum Construction.

.3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

.1 Submit in accordance with Section 01 33 00.
.2 Provide shop drawing details of aluminum safety grating for review including details of grating connection to steel stringers.

1.4 DELIVERY AND STORAGE

.1 Ensure safe delivery and storage of floats at site in area designated by Departmental Representative.
.2 Provide Departmental Representative with 2 days notice prior to shipping.
.3 Waste Management and Disposal:
.1 Separate waste materials for reuse and recycling in accordance with section 01 74 20.

1.5 MEASUREMENT PROCEDURES

.1 Floats will be measured by each float fabricated, delivered and installed at the site and shall include all labour, materials and equipment necessary to fabricate, transport and install.
.2 Aluminum Gangways will be measured by each gangway fabricated, delivered and installed at the site and shall include all labour, materials and equipment necessary to fabricate, transport and install. Gangway hinge plates shall be considered included and will not be measured seperately for payment.

- .3 Supply and installation of the leveling grout pad, threaded bars with nuts and washers, epoxy, and stainless steel hinge plate assemblies, including all necessary materials, labour and equipment, will be considered incidental to each gangway and will not be measured separately for payment.

1.6 PROTECTION

- .1 Protect work from damage resulting from work of other sections and from damage resulting from environmental conditions.
- .2 Repair or replace at no extra cost damage caused by work.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Hollow structural steel sections: to CAN/CSA-G40.20/G40.21-04(R2009), Grade 350W, Class H.
 - .2 Structural steel plates, shapes, bars: to CSA G40.20-13/G40.21-13, Grade 350W, minimum 30% recycled content.
 - .3 Aluminum, shapes, tubes and plates: to ASTM B209 and ASTM B221M, grade 6061 T6.
 - .4 Galvanized bolts and nuts: to ASTM A307-14, minimum 30% recycled content, hot dipped.
 - .5 Washers: galvanized pressed steel.
 - .6 Lumber: to National Lumber Grades Authority Standard Grading Rules for Canadian Lumber effective 2014, species and grade category as follows:
 - .1 Fascia and planks: 100% S-P-F "No. 1".
 - .2 Preservative treatment: to Section 06 05 73.
 - .3 Forest Stewardship Council (FSC) certified.
 - .7 Safety Grating: Aluminum to ASTM B221M, Grade 6063-T6. Depth of deck 25.4 mm. Minimum section modulus 7472 mm³/304.5 mm width.
-

- .8 Threaded rods, nuts, and washers: to ASTM F593-13ae1, (304/316) condition CW.
- .9 Non-shrink grout: composition of non metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 50 MPa at 28 days.
- .10 Epoxy for threaded rods: 2 component, solvent free, high modulus, moisture insensitive, high strength structural epoxy suitable for use in cracked or uncracked concrete and capable of developing an ultimate tensile strength of 100 kN at an embedment depth of 175 mm in 28 MPa concrete for a 19 mm diameter threaded rod.
- .11 Nuts, bolts, pins and screws for ramp and float decking and ramp hinges: to ASTM A193 B8, Class 1, AISI Type 304.
- .12 Spikes and nails: spiral type, galvanized to CSA B111-1974(R2003).
- .13 Gangway Wheels: polyurethane
- .14 Bushings, Washers and Transition Nosing: ultrahigh molecular weight polyethylene (UHMWPE), colour black and UV stabilized.
 - .1 Density: 0.940.
 - .2 Tensile Strength: 40 MPa(ultimate).
 - .3 Compressive Yield Strength: 22.8 MPa.
- .15 Bollards and Hinge Plates: stainless steel plate to ASTM A240/A240M and stainless steel pipe to ASTM A269/A269M, type 304/316.
- .16 Welding Materials: to CSA W59 and CSA W59.2.
- .17 Welding electrodes for steel: to CSA W48 Series.
- .18 Chain and Shackles: to Section 35 51 16.

PART 3 - EXECUTION

3.1 REMOVALS

- .1 Perform removals in accordance to Section 02 41 14.
-

3.2 FLOAT
FABRICATION

- .1 Construct floats as indicated on drawings.
 - .2 Build work square, true, straight, and accurate to the required size.
 - .3 Complete welding to Section 05 12 35.
 - .4 Close off pipe float ends with steel plate fully welded all around. Install plugs on top section of pipe floats to permit pressure testing for air tightness. Carry out air testing at 340 kPa for 15 minutes, repair leaks and repeat test. Tightly seal plugs upon completion of testing.
 - .5 Fabricate steel saddle frames as detailed.
 - .6 Drill holes for bolts 2 mm larger than bolt diameter in steel sections and the same diameter as bolt in timber, except where specified otherwise.
 - .7 Place washer under heads or nuts of bolts in contact with wood.
 - .8 Fabricate and install pipe bollards in locations indicated. Cap top of bollards with plate and grind all rough or sharp edges smooth.
 - .9 Fasten aluminum safety grating at each stringer contact complete with bond breaker. Apply continuous bond breaker anchored to each stringer below aluminum decking contact area.
 - .9 Install timber fascia as detailed.
 - .10 Nail and bolt fascia timbers along both sides and ends of float. Spiral nails to be at 300 mm centers and bolts to be at 1500 mm centers for side fascia. Nail end fascias with two nails per contact.
 - .11 Fabricate access hatches to details indicated.
 - .12 Fabricate and install hinge connections in manner and location indicated.
-

3.3 Aluminum Gangways

- .1 Construct gangways as indicated on drawings.
- .2 Build work square, true, straight, and accurate to required size.
- .3 Fabricate and install hinge plates to details indicated.
- .4 Complete welding to Section 05 12 35.

3.4 HANDLING AND USE TREATED LUMBER

- .1 Handle and use treated material in a manner of which will avoid damage of field fabrication causing alteration in original treatment.
- .2 Apply preservative to end cuts.

3.5 FLOAT INSTALLATION

- .1 Install floats in location and to details indicated on the drawing.

3.6 EXISTING ANCHOR BLOCKS INSTALLATION

- .1 Install and attach existing anchor blocks to floats in location and in manner shown on drawings and to Section 35 51 16.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 35 51 15: Floats and Ramps.

1.2 REFERENCE STANDARDS

- .1 Do welding to CSA W59-13 unless specified otherwise.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-A23.3-04, Design of Concrete Structures.
 - .3 CSA-A23.4-05, Precast Concrete - Materials and Construction.
 - .4 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001-03, Cementitious Materials for use in Concrete.
 - .5 CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement.

1.3 MEASUREMENT PROCEDURES

- .1 Float anchor system will be measured by each salvaged anchor block completed with salvaged chains and shackles reinstalled satisfactorily shall include all labour, materials and equipment necessary to complete the work.
- .2 Assemblies of salvaged anchor blocks to salvaged chain to floats is considered included and shall not be measured separately for payment.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00
-

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Chain: Salvaged and identified by Departmental Representative as acceptable for re-use.
 - .2 Shackle: Salvaged and identified by Departmental Representative as acceptable for re-use.

PART 3 - EXECUTION

- 3.1 ANCHOR BLOCKS
- .1 Install salvaged anchor blocks, chains and shackles designated for reuse by Departmental Representative.
 - .2 Place anchor blocks and chains as detailed in the drawings.
 - .3 Adjust chain length to remove excess chain slack and excess drift of floats.