

**SPECIFICATIONS FOR  
WHARF REPAIRS  
MEAFORD, ONTARIO**



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

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## **01 11 05 – GENERAL INSTRUCTIONS**

### **Part 1 General**

#### **1.1 DESCRIPTION OF WORK**

- .1 The site of work is the concrete wharf rehabilitation in Meaford, Ontario. Meaford is located at the west shore of Nottawasaga Bay off of Georgian Bay in Lake Huron.
- .2 The work under this contract covers:
  - .1 Demolition and removal of designated areas of the existing concrete deck on the west basin wall.
  - .2 The construction of a new concrete deck, installation of new rubber fenders, pipe bollards, steel pile cap, granular fill and ladder handholds.
- .3 The work to be done by the Contractor under this Contract shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, insurance, and all things necessary for and incidental to the satisfactory performance and completion of all work as specified herein. All work to be done in accordance with details shown on the accompanying plans as specified herein.

#### **1.2 DEFINITIONS**

- .1 The word "provide" means "supply and install".
- .2 For purposes of this contract, "Departmental Representative", "Architect/Engineer" and "Engineer" shall have the same meaning.

#### **1.3 WORK SCHEDULE**

- .1 Provide within 10 working days after Contract award, schedule showing anticipated progress stages and final completion of work within time period required by contract documents.
- .2 Interim reviews of work progress based on work schedule will be conducted as decided by the Engineer and schedule updated by Contractor in conjunction with and to approval of the Engineer.
- .3 Work under this contract is to be performed in a timely manner. Commence planning and preparatory work immediately upon receipt of official notification of acceptance of Contract and schedule the work so that the project will be complete by dates shown in contract documents.
- .4 Work sequence:
  - .1 Before work is undertaken, ensure that all materials and trades required are available to finish work in as short a period as possible.
  - .2 No area to be renovated shall be placed out of service until it is confirmed that there shall be no need to stop the work waiting for receipt of materials, equipment or labour.

**1.4 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.

**1.5 FEES, PERMITS AND CERTIFICATES**

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

**1.6 MEASUREMENT FOR PAYMENT**

- .1 Notify the Engineer sufficiently in advance of operations to permit required measurements for payment.
- .2 Submit to the Engineer, at least 14 days before Information for first application for payment, cost breakdown, Progress Payment in detail as directed by the Engineer, for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications for payment. After approval by the Engineer, cost breakdown will be used as basis for progress payments.

**1.7 INTERPRETATION OF DOCUMENTS**

- .1 In the event of discrepancies or conflicts in interpreting the Plans (drawings) and Specifications, Specifications take precedence over drawings bound with specifications.
- .2 Drawings and specifications are complementary. When work is shown or mentioned on the drawings but is not indicated in the specifications, or when work is indicated in the specifications but is not shown or mentioned on the drawings, it shall nevertheless be included in the Contract.
- .3 The sub-division of the Specification into sections, identified by title and number, is for convenience only and does not modify the singularity of the document, nor does it operate to make or imply that the Engineer is an arbiter to establish the limits or extent of contract between Contractor and Subcontractors or to determine the limits or extents of work that may be decided by trade unions or contractors' organizations. Extras to the Contract will not be considered on the grounds of differences in interpretation of the Specification and/or Drawings as to which trade performs the work.
- .4 Do not scale off drawings.

**1.8 CONTRACTOR'S USE OF SITE**

- .1 Co-ordinate use of premises under direction of the Engineer.
- .2 Do not unreasonably encumber the site with materials and equipment.
- .3 Assume full responsibility for protection and safekeeping of products under this Contract.
- .4 Move stored products or equipment which interfere with operations of the Engineer or other harbour users.
- .5 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

- .6 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .7 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by the Engineer.
- .8 At completion of operations the condition of the existing work shall be equal to or better than that which existed before new work started.

## **1.9 EXISTING SERVICES**

- .1 Notify the Engineer and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give the Engineer 72 hours notice for necessary interruption of mechanical or electrical service throughout the course of work. Minimize duration of interruptions.
- .3 Establish location and extent of service lines in area of work before starting Work. Notify the Engineer of findings.
- .4 Submit schedule to and obtain approval from the Engineer for any shut-down or closure of active service or facility including power and communications services. Adhere to the approved schedule and provide notice to affected parties.
- .5 Where unknown services are encountered, immediately advise the Engineer and confirm findings in writing.
- .6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .7 Record locations of maintained, re-routed and abandoned service lines.

## **1.10 DOCUMENTS REQUIRED**

- .1 Maintain at the job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 Change Orders.
  - .6 Other Modifications to Contract.
  - .7 Copy of Approved Work Schedule.
  - .8 Health and Safety Plan and Other Safety Related Documents.
  - .9 Other documents as specified.

## **1.11 CODES AND STANDARDS**

- .1 Perform work in accordance with National Building Code of Canada (NBC) and any other code of Provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

- .2 Work to meet or exceed requirements of contract documents, specified standards, codes and referenced documents.

#### **1.12 PROJECT MEETINGS**

- .1 The Engineer will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

#### **1.13 SETTING OUT OF WORK**

- .1 Engineer will provide only those survey control points and set such stakes as necessary to define general location, alignment and elevations of work. Give engineer reasonable notice of requirements for such control points and stakes.
- .2 Set grades and lay out work in detail from control points and grades established by the Engineer.
- .3 Provide devices needed to lay out and construct work.
- .4 Supply such devices needed to lay out and construct work.
- .5 Supply such devices as straight edges and templates required to facilitate the Engineer's inspection of work.
- .6 Supply stakes and other survey markers required for laying out work.

#### **1.14 ADDITIONAL DRAWINGS**

- .1 The Engineer may furnish additional drawings for clarification. These additional drawings have the same meaning and intent as if they were included with plans referred to in Contract documents.
- .2 When additional drawings and instructions are required by the Contractor, provide reasonable notice in writing to the Engineer in advance of the date they are required.

#### **1.15 EXAMINATION**

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

#### **1.16 SITE**

- .1 Confine work, including temporary structures, plant, equipment and materials to the established limits of site.
- .2 Locate temporary buildings, roads, walk, drainage facilities, services as directed and maintain in clean and orderly manner.

#### **1.17 SITE INSPECTION**

- .1 The submission of a tender is deemed to be a confirmation of the fact that the Tenderer has inspected the site and is fully conversant with all the conditions under which the work is to be carried out.

**1.18 MATERIAL AND EQUIPMENT**

- .1 Use new products unless otherwise specified.
- .2 Deliver and store material and equipment to the manufacturer's instructions with manufacturer's labels and seals intact.
- .3 When material or equipment is specified by standard performance specifications, upon request of the Engineer, obtain from the manufacturer an independent testing laboratory report, stating that the material or equipment meets or exceeds the specified requirements.

**1.19 SECURING WORK AREA**

- .1 Secure the work areas in each stage in an approved manner. This includes fencing or barricades to prevent public access to any areas where construction activities occur and construction materials are stored.

**1.20 VEHICLE AND PEDESTRIAN PROTECTION**

- .1 Provide snow fencing, wooden barriers, or other approved barriers to prevent vehicles and pedestrians from accessing the site during construction.
- .2 Contractor shall provide appropriate signage for vehicle and pedestrian protection.
- .3 All barriers shall include delineation and reflectors to stand out at nightfall.

**1.21 DRAWINGS**

- .1 The following drawings are to be read in conjunction with this specification:
  - .1 MA-01 Meaford – Wharf Repairs
  - .2 MA-02 Meaford – Wharf Repairs

**1.22 DATUM**

- .1 Elevations and soundings shown on Drawings are expressed in metres relative to chart datum.
- .2 Chart datum for Lake Huron (Georgian Bay) is 176.0 metres I.G.L.D (1985).

**END OF SECTION**

## **01 35 29 – HEALTH AND SAFETY REQUIREMENTS**

### **Part 1 General**

#### **1.1 MEASUREMENT FOR PAYMENT**

- .1 No measurement will be made under this Section.

#### **1.2 REFERENCES**

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Ontario
  - .1 The Workers Compensation Act

#### **1.3 SUBMITTALS**

- .1 Submit site-specific Health and Safety Plan, to the Engineer, within 10 days of the Notice to Proceed and prior to commencement of Work.
- .2 Submit copies of incident and accident reports to the Engineer.
- .3 Submit WHMIS MSDS – Material Safety Data Sheets to Engineer.
- .4 The Engineer will review Contractor's site-specific Health and Safety Plan and provide comments to the Contractor, if any. Revise the plan as appropriate and resubmit plan to the Engineer within 5 days after receipt of comments from the Engineer.
- .5 The Engineer'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 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

#### **1.4 FILING OF NOTICE**

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

#### **1.5 SAFETY ASSESSMENT**

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

#### **1.6 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 Observe and enforce construction safety measures required by Canadian Construction Safety Code, Provincial Government, Worker's Compensation Board and municipal statutes and authorities.
- .3 In the event of a conflict between any provisions of above authorities having the most stringent provision will apply.

#### **1.7 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.

#### **1.8 UNFORSEEN HAZARDS**

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province having jurisdiction and advise Engineer verbally and in writing.

#### **1.9 HEALTH AND SAFETY CO-ORDINATOR**

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
  - .1 Have site-related working experience specific to activities associated with dock reconstruction at an active harbour site.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 Be on site during execution of Work.

#### **1.10 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 having jurisdiction, and in consultation with the Departmental Representative verbally and in writing.

#### **1.11 CORRECTION OF NON-COMPLIANCE**

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

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

### **01 35 43 – ENVIRONMENTAL PROCEDURES**

#### **Part 1 General**

##### **1.1 MEASUREMENT FOR PAYMENT**

- .1 No separate measurement will be for work of this section. Work is incidental to the project cost.

##### **1.2 FIRES**

- .1 Fires and burning of rubbish on site not permitted.

##### **1.3 DRAINAGE**

- .1 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .2 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

##### **1.4 WORK ADJACENT TO WATERWAYS**

- .1 Construction equipment to be operated on land only.
- .2 No construction debris from work activities will be allowed to enter the lake. The work site must be cleaned daily. Every effort will be made to minimize the introduction of sediment to the lake during work activities.
- .3 In-water work shall take place when water levels are normally low.
- .4 All materials and equipment used for the purpose of site preparation and project completion shall be operated, maintained, and stored in a manner that prevents any deleterious substance (e.g. petroleum products, silt etc.) from entering the water.
- .5 Remove debris by hand or with machinery operating from shore or a floating barge. Explosives are not to be used to remove debris
- .6 Use measures such as barges or shrouding that shall be kept tight to the wall surface being repaired to prevent concrete and/or other materials from entering the watercourse.
- .7 Waterways to be free of excavated fill, waste material and debris.
- .8 Any impacts below ordinary high water mark that are not shown on the site plan are not permitted without written approval from the Engineer. Up to 30 days may be required for approval.
- .9 Reclaim and restore disturbed areas to previous or better condition.
- .10 Areas used for stockpiling construction materials, including fill or other equipment storage will be well back from the edge of the water body and, if possible, in areas which have already been disturbed or are devoid of vegetation.

- .11 All required machinery should be supplied with appropriate spill containment kits as a precaution in the event of accidental fuel spills or hydraulic leaks. Additional kits should be available on site with the capacity to contain any spills of deleterious substances that may be reasonably expected to occur. Contractors should ensure that all personnel are familiar with the spill kits.

## **1.5 POLLUTION CONTROL**

- .1 Control emissions from equipment and plant to local authorities' emission requirements.
- .2 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .4 Locate temporary fuel storage 100 metres from shore and comply with Provincial Environmental Legislation.
- .5 Refueling, servicing, or cleaning of equipment on ice or within 100 metres of shore is prohibited. Contractor to ensure all equipment operating on project is free of external fluid leaks, grease, oil, and mud.
- .6 Contractor to contain all oil leaks from equipment working adjacent to waterways.
- .7 No maintenance of vehicles or equipment in construction areas.
- .8 Use drip pans to catch leaking oil from compressors, pumps, etc.
- .9 Keep an emergency spill kit for in-water use on site during construction.
- .10 Disposal of wastes
- .11 Do not bury rubbish and waste materials on site unless approved by Engineer.
- .12 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways. Hazardous wastes including fuels, oils and lubricants to be disposed of by a licensed hazardous waste carrier/handler in accordance with Provincial Environment Legislation.
- .13 Collect all rubbish and waste material and dispose of in accordance with applicable governing authorities.
- .14 Do not allow debris of any type to enter waterway.

## **1.6 PLANT PROTECTION**

- .1 Protect trees and plants on site and adjacent properties.
- .2 Avoid disturbance of topsoil and vegetation unless otherwise specified. Contractor is responsible to restore all impacted areas to original state.
- .3 The Contractor shall revegetate soil in areas exposed by construction with vegetation species native to the area. These areas shall be revegetated as quickly as possible following construction to prevent soil erosion and establishment of noxious weeds.

**Part 2            Products**

**2.1                NOT USED**

.1            Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

**01 45 00 – QUALITY CONTROL**

**Part 1            General**

**1.1                MEASUREMENT FOR PAYMENT**

- .1        No measurement will be made under this Section.

**1.2                INSPECTION**

- .1        Allow the Engineer access to the Work. If part of the Work is in preparation at locations other than the Place of Work, allow access to such Work whenever it is in progress.
- .2        Give timely notice requesting inspection if the Work is designated for special tests, inspections or approvals by the Engineer.
- .3        The Engineer will order part of the Work to be examined if the Work is suspected to be not in accordance with the Contract Documents. If, upon examination such work is found not in accordance with the Contract Documents, correct such Work and pay cost of examination and correction.

**1.3                INDEPENDENT INSPECTION AGENCIES**

- .1        Independent Inspection/Testing Agencies may be engaged by the Engineer for purpose of inspecting and/or testing portions of the Work.
- .2        Provide equipment required for executing inspection and testing by appointed agencies.
- .3        Employment of inspection/testing agencies does not relax responsibility to perform the Work in accordance with the Contract Documents.
- .4        If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct the defect and irregularities as advised by the Engineer at no additional cost. Pay costs for retesting and reinspection.

**1.4                ACCESS TO WORK**

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

**1.5                PROCEDURES**

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

**1.6 REJECTED WORK**

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

**1.7 TESTS AND MIX DESIGNS**

- .1 Furnish test results and mix designs as requested.

**1.8 MILL TESTS**

- .1 Submit mill test certificates as requested.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**01 77 00 – CLOSEOUT PROCEDURES**

**Part 1           General**

**1.1           MEASUREMENT FOR PAYMENT**

- .1       No measurement will be made under this Section.

**1.2           ADMINISTRATIVE REQUIREMENTS**

- .1       Acceptance of Work Procedures:
  - .1       Contractor's Inspection: the Contractor is to conduct an inspection of the Work, identify deficiencies and defects, and repair as required to conform to the Contract Documents.
  - .2       Final Inspection:
    - .1       When completion tasks are done, request final inspection of the Work by the Engineer.
    - .2       When the Work is incomplete, according to the Engineer, complete the outstanding items and request re-inspection.

**1.3           FINAL CLEANING**

- .1       Remove surplus materials, excess materials, rubbish, tools and equipment.

**1.4           RECORD DRAWINGS**

- .1       Maintain project “as-built” record drawings and record accurately significant deviations from the Contract Documents caused by site conditions and changes ordered by the Engineer.
- .2       Mark “as-built” changes in red coloured ink.
- .3       Record the following information:
  - .1       Field changes of dimension and detail.
  - .2       Changes made by Change Order or Field Order.
- .4       At completion of the project and prior to final inspection, neatly transfer “as-built” notations to a second set and submit both sets to the Engineer.

**Part 2           Products**

**2.1           NOT USED**

- .1       Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

## **02 41 13 – SELECTIVE SITE DEMOLITION**

### **Part 1 General**

#### **1.1 MEASUREMENT FOR PAYMENT**

- .1 Mobilization, demobilization, all materials and work required for the demolition, removal and disposal of all components identified on the drawings and as specified are considered part of the lump sum amount for the project. The items to be demolished, removed and disposed of, but not limited to, are as follows unless specified otherwise:
  - .1 Concrete related components: concrete deck slab and reinforcing steel.
  - .2 Existing bollards, mooring rings & cleats, timber fenders, steel pile cap, metal fastenings and rubber tires
  - .3 Appurtenances related to items listed above
- .2 Removal, salvage and reinstatement of existing concrete pavers required to complete the work are incidental to the work performed and will not be measured separately for payment.

#### **1.2 DELIVERY, STORAGE AND HANDLING**

- .1 Storage and Protection.
  - .1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to the approval of the Engineer and at no cost to the Engineer.
  - .2 Remove and store materials to be salvaged, in a manner to prevent damage.
  - .3 Store and protect in accordance with requirements for maximum preservation of material.
  - .4 Handle salvaged materials as new materials.

#### **1.3 SITE CONDITIONS**

- .1 Site Environmental Requirements.
  - .1 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
  - .2 Ensure proper disposal procedures are maintained throughout the project.

### **Part 2 Products**

#### **2.1 NOT USED**

- .1 Not Used.

**Part 3            Execution**

**3.1                PREPARATION**

- .1      Inspect site and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2      Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3      Notify and obtain approval of utility companies before starting demolition.

**3.2                REMOVAL OPERATIONS**

- .1      Remove items as indicated on the drawings
- .2      Do not disturb items designated to remain in place.

**3.3                REMOVAL FROM SITE**

- .1      Dispose of materials, not designated for salvage or re-use in work, to an off-site location acceptable to the Engineer.

**3.4                RESTORATION**

- .1      Remove debris, trim surfaces and leave the work site clean, upon completion of the Work.
- .2      Reinstate areas and existing works outside areas of the demolition to conditions that existed prior to commencement of work.

**END OF SECTION**

## **05 55 00 – METAL FABRICATIONS**

### **Part 1 General**

#### **1.1 MEASUREMENT FOR PAYMENT**

- .1 Supply and installation of rubber fender assemblies including chains, shackles, eyebolts and all associated hardware will be measured by each unit supplied and incorporated into the work and shall include all labour, equipment, and materials necessary to complete the work.
- .2 Supply and installation of new bollards will be measured by each unit and shall include all labour, equipment and materials necessary to complete the work.
- .3 Supply and installation of new safety handholds and ladder extensions will be measured at each ladder location installed and shall include all labour, equipment and materials necessary to complete the work.
- .4 Supply and installation of new steel pile cap and corner plate will be measured by the linear meter supplied and installed and shall include all labour, equipment, and materials necessary to complete the work.

#### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM A307-[02], Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.40-[97], Anti-corrosive Structural Steel Alkyd Primer.
  - .2 CAN/CGSB-1.181-[92], Ready-Mixed, Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel.
  - .2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CAN/CSA-S16.1-[01], Limit States Design of Steel Structures.
  - .4 CSA W48-[01], Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .5 CSA W59-[1989(R2001)], Welded Steel Construction (Metal Arc Welding) (Imperial Version).

#### **1.3 RELATED SECTIONS**

- .1 Section 02 41 13 – Selective Site Demolition
- .2 Section 35 31 26 – Concrete Wharf Work

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Steel sections and plates and bars: to CAN/CSA-G40.20/G40.21, Grade 350W.
- .2 Steel Pipe: to ASTM A53/A53M-07, Grade B
- .3 Hollow structural sections to CAN/CSA-G40.20/G40.21, Grade 350W, Class H.
- .4 Welding materials: to CSA W59.
- .5 Welding electrodes: to CSA W48 Series.
- .6 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610g/m<sup>2n</sup> to CAN/CSA-G164.
- .7 Bolts, nuts and washer: to ASTM A307-04, hot dipped galvanized.
- .8 Primer: rust inhibiting, low VOC, modified alkyd resin primer, 51% solids by volume, compatible with specified paint.
- .9 Paint: two component, high solids, polyester-aliphatic urethane suitable for marine environment, volume of solids 65%; Colour: traffic yellow.
- .10 Epoxy: 2 component, solvent free, high modulus, moisture insensitive, high strength structural epoxy capable at a minimum depth of 170mm to develop a tensile bond of 50kN for a 19mm diameter anchor bolt in 35 mPa compressive strength concrete.

### **2.2 FABRICATION**

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Verify field dimensions prior to fabrication of all components. Adjust dimensions of new fabrications to accommodate existing conditions.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

### **2.3 SHOP PAINTING**

- .1 Primer: VOC limit 250 g/L maximum to GS-11 CCD-047a CCD-048.
- .2 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .3 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.
- .4 Clean surfaces to be field welded; do not paint.

### **2.4 PIPE BOLLARDS**

- .1 Steel sections and plates and bars: to CAN/CSA-G40.20/G40.21, Grade 350W.
- .2 Steel Pipe: to ASTM A53/A53M-07, Grade B

- .3 Finish: shop painted.
  - .1 Primer: VOC limit 250 g/L maximum to GS-11 when applied on site.
  - .2 Traffic Yellow

## **2.5 RUBBER FENDERS**

- .1 Rubber Fender Elements shall be extruded rubber homogenous and free from any defects, impurities, & cracks:
  - .1 125mm O.D x 63 I.D. Cylindrical Fender: O-Shaped with a Reaction/Energy absorption ratio of 13.3 at 50% deflection.
- .2 Bolts and anchor bolts: to ASTM A307.
- .3 Shackles: Bolt type chain shackle, size and grade to match chain strength.
- .4 Ring: Hot Dipped Galvanized 100mm O.D, 19mm thick
- .5 Chain: Grade 30 proof coil, galvanized, size as indicated
- .6 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610g/m<sup>2n</sup> to CAN/CSA-G164.

## **2.6 STEEL PILE CAP**

- .1 6mm thick steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W.
- .2 Finish: shop painted.
  - .1 Primer: VOC limit 250 g/L maximum to GS-11 when applied on site.

## **2.7 STEEL CORNER PLATE**

- .1 6mm thick bent steel plate: to CAN/CSA-G40.20/G40.21, Grade 350W.
- .2 15M Studs, 150mm long, welded at 500mm C/C
- .3 Finish: shop painted.
  - .1 Primer: VOC limit 250 g/L maximum to GS-11 when applied on site.
  - .2 Finish: Traffic Yellow

## **2.8 SAFETY LADDERS & HANDHOLDS**

- .1 Chain: Grade 30 proof coil, galvanized, size as indicated
- .2 Fixed rungs: 25mm diameter by 450mm long, prime painted. Shop weld to chain at 300mm centres.
- .3 Shackles: Bolt type chain shackle, size and grade to match chain strength.
- .4 Handholds: 25mm diameter bent bar.
- .5 Finish: shop painted.
  - .1 Primer: VOC limit 250 g/L maximum to GS-11 when applied on site.
  - .2 Traffic Yellow

**Part 3            Execution**

**3.1                ERECTION**

- .1      Do welding work in accordance with CSA W59 unless specified otherwise.
- .2      Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3      Provide suitable means of anchorage acceptable to Engineer such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4      Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5      Provide components for building by other sections in accordance with shop drawings and schedule.
- .6      Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .7      Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

**3.2                PIPE BOLLARDS**

- .1      Fabricate and install pipe bollards in locations and in matter shown.
- .2      Pipe Bollards to be cast into new concrete deck slab as detailed on the drawings
- .3      Paint as specified.

**3.3                RUBBER FENDERS**

- .1      Install rubber fenders and all appurtenances in locations and matters shown.
- .2      Cast new 25mm new eye bolts minimum 170mm in concrete.
- .3      Install rubber fender units in matter shown securing chains and chain shackles to eye bolts.
- .4      Secure rubber fender element via 100mm diameter hot dipped galvanized ring, 19mm thick.
- .5      Adjust chain length so that rubber fender elements hang evenly at set distance indicated from the parapet.
- .6      Do not make alteration to system components without written permission by Departmental Representative.

**3.4                STEEL PILE CAP**

- .1      Trim existing steel sheet pile and prepare damaged sections to receive new pile cap.
- .2      Install continuous steel plate as indicated to top of steel sheet pilings.
- .3      Weld steel pile cap to steel sheet pilings at locations as indicated in drawings.

### **3.5 STEEL CORNER PLATE**

- .1 Fabricate and install continuous steel corner plate as detailed in the drawings.
- .2 Finish: shop painted.
  - .1 Primer: VOC limit 250 g/L maximum to GS-11 when applied on site.
  - .2 Traffic Yellow

### **3.6 SAFETY HANDHOLDS AND LADDER EXTENSIONS**

- .1 Install new ladder handholds at each existing ladder location.
- .2 Set new handholds at a minimum 150mm embedment of into new concrete slab using 25mm bent bars as detailed on the drawings.
- .3 Paint as specified.
- .4 Weld new 25mm rungs to new 13mm Chain as detailed in the drawings.
- .5 Install and secure new ladder extensions to each existing bottom rung of safety ladder using 16mm anchor shackles.

### **3.7 CLEANING**

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

### **3.8 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

### **3.9 PAINTING**

- .1 Preparation of new and salvaged metals:
  - .1 Preparation of new metal surfaces: Clean surfaces by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances.
- .2 Apply paint after surface has been cleaned.
- .3 Apply paint in shop using spraying equipment in accordance with the paint manufacturer's recommendations.
- .4 Apply one coat primer 3 to 5 mils and one coat of paint 2 to 3 mils. Total dry film thickness 5 to 7 mils.
- .5 Touch up paint after injuries to installation.

**END OF SECTION**

**31 00 29 – EXCAVATING AND BACKFILLING**

**Part 1 General**

**1.1 MEASUREMENT FOR PAYMENT**

- .1 New stone fill will be measured in tonnes of material supplied and installed to limits indicated and shall include all labour, equipment and materials necessary to complete the work.

**1.2 DESCRIPTION**

- .1 This section specifies requirements for supplying and placing stone fill to fill voids behind existing wall at out pan locations of the sheet pile wall.

**1.3 REFERENCES**

- .1 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation
  - .1 OPSS 1004 November 2006, Ontario Provincial Standard Specification, Material Specification for Aggregates - Miscellaneous.
  - .2 OPSS 1010 April 2004, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Stone fill: pea gravel, clean washed smooth stone with 100% passing 13.2mm sieve and 100% retained on 2.35mm sieve.

**2.2 EXCAVATION**

- .1 Excavate to lines, grades, elevations and dimensions shown on drawings.
- .2 Excavation must not damage or interfere with adjacent foundations.
- .3 Keep excavated and stockpiled materials safe distance away from edge of excavation.
- .4 Dispose of surplus and unsuitable excavated material off site.
- .5 Do not obstruct flow of surface drainage or natural watercourses.

**2.3 BACKFILLING**

- .1 Do not commence backfilling until areas of work have been inspected and approved by Engineer.
- .2 Ensure no frozen material is placed.
- .3 Place granular materials using methods which do not lead to segregation or degradation.
- .4 Place material to full width in uniform layers not exceeding 150 mm.
- .5 Shape each layer to smooth contour and compact before succeeding layer is placed.

- .6 Remove and replace portion of layer in which material has become segregated during spreading.

## **2.4 SITE TOLERANCES**

- .1 Finished granular surface to be within 50 mm of elevation as indicated but not uniformly high or low.

## **2.5 PROTECTION**

- .1 Maintain finished granular surface in condition conforming to this section until granular surfacing is accepted by Engineer.

## **Part 3 Execution**

### **3.1 STONE FILL**

- .1 Place stone fill in out pan locations of existing sheet pile wall as required.
- .2 Compact in place stone fill with portable concrete vibrator.
- .3 Continue to place stone fill followed by vibratory compaction.
- .4 Top up any settlement of stone fill. Complete final vibratory compaction and top up any settlement with stone fill.

**END OF SECTION**

**35 31 26 – CONCRETE WHARF WORK**

**Part 1 General**

**1.1 MEASUREMENT FOR PAYMENT**

- .1 Concrete shall be measured by the cubic meter supplied and installed and shall include all labour, materials, and equipment necessary to complete the work.
- .2 Reinforcing steel, lag bolts, splices, wire ties, bar supports, chairs, spacers and other accessories are considered incidental to item 1.1.1 above and will not be measured separately for payment.
- .3 Heating water, aggregates and providing cold weather protection considered included in the installation of concrete and will not be measured separately for payment.
- .4 Removal, salvage and reinstatement of concrete pavers required to perform work identified on the drawings as specified are incidental to the work performed and will not be measured separately for payment.
- .5 Expansion joints will be measured by the lineal metres and shall include all labour, materials and equipment necessary to complete the work. Joint filler, joint sealer and dowels is considered included in the installation of expansion joints,

**1.2 RELATED SECTIONS:**

- .1 Section 01 35 43: Environmental Procedures

**1.3 SUBMITTALS**

- .1 At least 2 weeks prior to beginning Work, submit to Departmental Representative product data for the following materials: non-shrink grout, joint sealer, joint filler, backer rod and bond breaker.
- .2 Concrete hauling time: submit for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

**1.4 QUALITY ASSURANCE**

- .1 Check dimensions at site before commencing work and report discrepancies to Departmental Representatives in writing.
- .2 Submit to Departmental Representative, minimum 2 weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.
- .3 Quality control plan: Submit written report to departmental representative verifying compliance that concrete in place meets performance requirements of concrete as established in Part 4 - products.
- .4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.

## **1.5 PROTECTION**

- .1 Protect work from damage resulting from work of other sections and from damage resulting from environmental conditions.
- .2 Existing items removed during demolition should be carefully noted and stored safely in order for them to be reused and incorporated into the new work. Ensure no additional damage is caused by a result of poor workmanship.

## **1.6 CLEANING**

- .1 Pressure wash concrete, steel and timber surfaces that will be in contact with new concrete. Water pressure is to be sufficient to remove any loose concrete, grout, marine vegetation, moss and algae from various surfaces.

## **1.7 DELIVERY**

- .1 Concrete hauling time: maximum allowable time for concrete to be delivered to site of work and discharged not to exceed 120 minutes after batching.
- .2 Modifications to maximum time limit must be agreed to Departmental Representative and concrete producer as described in CAN/CSA-A23.1/A23.2.
- .3 Deviations to be submitted for review by Departmental Representative.
- .4 Ensure continuous concrete delivery from plant meets CAN/CSA-A23.1/A23.2.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Concrete: Cement: to CAN/CSA-A3001, type GU.
- .2 Compressive strength: 35 MPa at 28 days.
- .3 Exposure class: C-1 to CAN/CSA-A23.1-04/A23.2-04.
- .4 Aggregate size: 20 mm.
- .5 Slump: 80 mm at time of deposit, +/- 20 mm.
- .6 Air content: Table 4, Category 2, 6%.
- .7 Admixtures: air entraining to ASTM C233
- .8 Standard Test Method for Air-Entraining Admixtu007Ares for Concrete. Calcium chloride or compounds containing calcium chloride not permitted.
- .9 Water: potable, to Table 9.
- .10 Reinforcing:
  - .1 Bar steel: to CAN/CSA-G30.18, grade 400R.
  - .2 Dowel bars: clean, straight and free from flattened or burred ends, plain round bars of grade 400R or better conforming to CSA-G40.21 and be epoxy-coated to ASTM A 775/A 775M.
- .11 Formwork: to CAN/CSA-A23.1/A23.2.

- .12 Joint filler: non-extruding, preformed, asphalt saturated fibre to ASTM D1751.
- .13 Joint sealer: chemical curing, multi- component compound to CAN/CGSB-19.24, type 1.
- .14 Backer rod: extruded closed-cell polyethylene foam backer rod to Departmental Representative's approval.
- .15 Epoxy adhesive for dowels: 2 component, solvent free, high modulus moisture insensitive, high strength structural epoxy capable at a minimum embedment depth 255 mm to develop a tensile bond of 200 kN minimum for a 20M reinforcing rod.
- .16 Galvanized lag bolts, bolts and nuts: to ASTM (Cont'd) A307-07b.
- .17 Wire nails, spikes, staples: to CSA-B111.

### **Part 3 Execution**

#### **3.1 REMOVALS OF EXISTING CONCRETE**

- .1 Saw cut 25 mm deep or as indicated along the existing concrete wharf wall at indicated limits of removal and concrete repair limits.
- .2 Remove concrete to depth indicated or to sound concrete whichever is greater.
- .3 In no case shall removed concrete be permitted to enter the waterway. Take necessary action to capture all removed concrete.
- .4 Dispose removed concrete legally off site.
- .5 Maintain existing reinforcing steel where encountered during concrete removal

#### **3.2 PLACING REINFORCEMENT**

- .1 Accurately place reinforcing steel in the positions shown on the drawings and hold firmly during the placing, compacting and setting of concrete.
- .2 Reinforcement must be in place and inspected by the Departmental Representative before concrete is placed.
- .3 Install epoxied dowels to minimum depth indicated or epoxy manufactures required depth, whichever is greatest.

#### **3.3 FORMWORK**

- .1 Provide temporary structural supports as required to complete the concrete repairs to the wharf wall.
- .2 Erect formwork to CAN/CSA-A23.1/A23.2.
- .3 Install formwork to details and types indicated for respective field conditions.
- .4 Bolt timber formwork to the face of the wall, in accordance with Section 01 35 43

#### **3.4 CONCRETE**

- .1 Provide Departmental Representative 48 hours notice prior to placing concrete.

- .2 Do not pour concrete on soil which has been allowed to dry out. If soil is exposed to drying for three or more days, moisten by sprinkling water on it before any concrete is placed.
- .3 In no case deposit concrete against frozen material.
- .4 Carry out the placing of concrete continuously from joint to joint. Unless otherwise specified vibrate the concrete mechanically.
- .5 Anchor bolts and dowels: Accurately set all necessary anchor bolts and dowels to details indicated.
- .6 During freezing conditions, protect holes from water accumulations at all times.
- .7 Complete work to following tolerances: Straight to 1:500. Thickness to 6 mm. Plumb to 1:600.

### **3.5 CONTROL JOINTS**

- .1 Cut and form control joints in slab at locations indicated, in accordance with CSA A23.1/A23.2 and install specified joint sealer/filler.
- .2 Construct joints plumb, straight and square to details indicated.
- .3 Install dowels, joint filler, backer rod and joint sealant at all expansion joints as detailed.
- .4 Locations and thickness of expansion joints as shown on drawings.

### **3.6 FINISHING**

- .1 Finish concrete to CAN/CSA-A23.1/A23.2 and CAN/CSA-A438.
- .2 Wood float and broom sweep at exposed horizontal surface locations.
- .3 Steel trowel to smooth dense surfaces (Cont'd) elsewhere.
- .4 Apply smooth rubbed finish to formed surface exposed to view.

### **3.7 CURING**

- .1 Cure concrete in accordance with CAN/CSA A23.1/A23.2, Clause 7.4 and Appendix D CAN/CSA-A438.
- .2 Provide cold weather protection during curing period.

### **3.8 CO-OPERATION AND ASSISTANCE TO ENGINEER**

- .1 Cooperate with Engineer on inspection of work and provide assistance requested.

### **3.9 MONITORING OF WORK**

- .1 Contractor is responsible to monitor effectiveness and productivity of his own work on an ongoing basis.

### **3.10 FINAL CLEANING**

- .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**