

**SPECIFICATIONS FOR  
BREAKWATER RECONSTRUCTION  
PROVIDENCE BAY, ON**



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 Providence Bay Harbour in Providence Bay, Ontario. Providence Bay is located on the south shore of Manitoulin Island, on Lake Huron.
- .2 The work under this contract covers:
  1. Demolition and removal of designated areas of the existing timber crib and concrete surfaced breakwater wharf.
  2. The placement of new core stone and new armour stone, to encapsulate the existing breakwater wharf.
  3. Supply and installation of new precast concrete panels and steel sleepers to reconstruct the existing launch ramp.
- .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 when 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 of 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 CONTRACT METHOD**

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

**1.12 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.

**1.13 PROJECT MEETINGS**

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

**1.14 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.

**1.15 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.

**1.16 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.

**1.17 SITE**

- .1 Confine work, including temporary structures, plant, equipment and materials to the established limits of site.

- .2 Locate temporary buildings, roads, walks, drainage facilities, services as directed and maintain in clean and orderly manner.

#### **1.18 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.

#### **1.19 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.

#### **1.20 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.

#### **1.21 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.

#### **1.22 DRAWINGS**

- .1 The following drawings are to be read in conjunction with this specification:
  - .1 MA-01 Providence Bay Existing Wharf Plans and Sections
  - .2 MA-02 Providence Bay New Breakwater Plans and Sections
  - .3 MA-03 Providence Bay Launch Ramp Plans and Sections

#### **1.23 DATUM**

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

**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 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        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.
- .4        Do not use waterway beds for borrow material.
- .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.
- .12 The Contractor shall report spills of fuels or other contaminants to the Engineer.
- .13 The Contractor shall not remove, destroy or disturb species pursuant to Provincial Threatened Endangered and Extirpated Species regulation, or species listed in the federal Species at Risk Act.
- .14 The Contractor shall not disturb migratory bird nests.

## **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 Amass all rubbish and waste material and dispose of in accordance with applicable governing authorities.
- .14 The Contractor shall dispose of non-reusable construction debris and solid waste from construction at a waste disposal ground operating under the authority of a permit under Provincial regulation.
- .15 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.

#### **1.7 VERTICAL SILT CURTAIN**

- .1 The Contractor is to isolate the work area from the lake with an approved silt curtain to prevent the drift of sediment from the work area into the lake. The silt curtain must extend from the top of the water to within 300mm of the lake bottom. The silt curtain must be left in place until all suspended sediments are settled out. On completion of the project carefully remove silt curtain to ensure settled sediment is not disturbed. Costs for supply, installation, maintenance, and removal will be considered part of the lump sum arrangement.
- .2 Silt curtain geosynthetics shall have a grab tensile strength of at least 990 N, meeting CAN/CGSB 148.1, No. 7.3 and be one of geotextile or geomembrane.
- .3 Silt curtain floatation shall be a material that has sufficient buoyancy to provide the curtain with continuous support and a minimum of 50 mm freeboard.
- .4 Silt curtain ballast shall be minimum 8 mm steel chain.
- .5 Silt curtains shall be free of tears and gaps.
- .6 Construction shall be monitored to ensure that the mitigation measures are effective at containing the sediment. Adjustments may have to be made to ensure the containment is functioning properly.

#### **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.
  - .3        Final Payment:
    - .1        When the Engineer considers final deficiencies and defects corrected and requirements of the Contract met, make application for final payment.
  - .4        Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with contractual agreement.

#### **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 Description**

- .1 This section specifies requirements for the following work:
  - .1 Removal and disposal of parts of the existing breakwater wharf at Providence Bay, ON.
  - .2 Removal and disposal of parts of the existing launching ramp.
  - .3 Removal and disposal of the existing navigational aid.

#### **1.2 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 arrangement. The items to be demolished, removed and disposed of, but not limited to, are as follows unless specified otherwise:
  - .1 Concrete related components: concrete blocks, parapets, deck slab, concrete walls, launch ramp pads.
  - .2 Bollards, Tie Rods, Anchors, Metal Fastenings, navigation aid base.
  - .3 Timber Cribwork and Sleepers.
- .2 Removal and temporary storage of navigation aid shall be included in the lump sum costs for the project.

#### **1.3 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.

#### **1.4 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 Reinstall areas and existing works outside areas of the demolition to conditions that existed prior to commencement of work.

**Part 4 Execution**

**4.1 VERIFICATION**

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria and provide verification of compliance.

**END OF SECTION**

**03 20 00 – CONCRETE REINFORCING**

**Part 1           General**

**1.1           MEASUREMENT PROCEDURES**

- .1       Include reinforcement costs in items of concrete work in Section 03 41 02 – Precast Concrete.

**1.2           RELATED SECTIONS**

- .1       Section 03 41 02 – Precast Concrete

**1.3           REFERENCES**

- .1       Canadian Standards Association (CSA International).
- .2       CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .3       CSA-A23.3-04, Design of Concrete Structures.
- .4       CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement, a National Standard of Canada.

**Part 2           Products**

**2.1           MATERIALS**

- .1       Substitute different size bars only if permitted in writing by Engineer.
- .2       Reinforcing steel: billet steel, grade 350, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.
- .3       Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-G30.18.
- .4       Cold-drawn annealed steel wire ties: to ASTM A497/A497M.
- .5       Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

**2.2           FABRICATION**

- .1       Obtain Engineer's approval for locations of reinforcement splices other than those shown on placing drawings.

**Part 3           Execution**

**3.1           PLACING REINFORCEMENT**

- .1       Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.

- .2 Prior to placing concrete, obtain Engineer's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete pour.

**END OF SECTION**

**03 41 02 – PRECAST CONCRETE**

**Part 1            General**

**1.1                MEASUREMENT PROCEDURES**

- .1      Precast concrete base will be measured for payment as individual units incorporated into work. Price per unit to include cost of supply, storage, delivery, installation and miscellaneous fittings (anchor bolts and lifting lugs). New pipe mast to be supplied by others. Installation of pipe mast is considered incidental to this item.
- .2      Precast concrete panels will be measured by each panel installed in the work and shall include all costs to supply, deliver, store and install including reinforcing steel and lifting devices.

**1.2                REFERENCES**

- .1      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.
  - .6      CSA-W59-03, Welded Steel Construction (Metal Arc Welding) (Metric version).

**1.3                PERFORMANCE REQUIREMENTS**

- .1      Length of precast elements not to vary from design length by more than plus or minus 50 mm.
- .2      Cross sectional dimensions of precast elements not to vary from design dimensions by more than plus or minus 50 mm.
- .3      Precast elements not to vary by more than plus or minus 50 mm from true overall cross sectional shape as measured by difference in diagonal dimensions.

**1.4                DELIVERY, STORAGE AND HANDLING**

- .1      Transport concrete base with points of support and direction of reactions approximately same as when they will be in final position in work.
- .2      Handle, store and protect concrete base in order to avoid damage to concrete.
- .3      Identify lifting points by inserting hooks during manufacture.

## **Part 2            Products**

### **2.1                MATERIALS**

- .1      Cement to CAN/CSA-A3001, Type GU.
- .2      Water: to CSA-A23.1/A23.2.
- .3      Reinforcing steel: to CAN/CSA-G30.18.
- .4      Hardware and miscellaneous materials: to CSA-A23.1/A23.2.
- .5      Anchors and supports: to CAN/CSA-G40.21 Type 300 W.
- .6      Welding materials: to CSA W48.
- .7      Air entrainment admixtures: to ASTM C260.

### **2.2                MIXES**

- .1      Concrete:
  - .1      Alternative 1 - Performance Method for specifying concrete: to meet Engineer performance criteria in accordance with CAN/CSA-A23.1/A23.2.
    - .1      Provide concrete mix to meet following hard state requirements:
      - .1      Durability and class of exposure: C-1.
      - .2      Minimum compressive strength at 28 days: 30 MPa.
      - .3      Surface texture: steel trowel finish.
    - .2      Provide quality management plan to ensure verification of concrete quality to specified performance.
    - .3      Concrete supplier's certification.

### **2.3                FINISHES**

- .1      Finish units to standard grade to CSA-A23.4.
- .2      Provide 10mm Deep Grooves as shown on the plan.

## **Part 3            Execution**

### **3.1                PRECAST WORK**

- .1      Do precast concrete work in accordance with CSA-A23.4 and CAN/CSA-A23.3.

### **3.2                PRECAST PANELS**

- .1      Confirm field dimension of length of each panel prior to casting panels. Fabricate panels in to detail indicated and length as determined by field measurements.
- .2      Install precast concrete panels as indicated on drawings.



**3.3 MANUFACTURED UNITS**

- .1 Manufacture units in accordance with CSA-A23.4.
- .2 Provide hardware suitable for handling elements.

**3.4 SOURCE QUALITY CONTROL**

- .1 Upon request, provide Engineer with certified copies of quality control tests related to this project as specified in CSA-A23.4.
- .2 Upon request, provide Engineer with certified copy of mill test report of reinforcing steel supplied, showing physical and chemical analysis.

**Part 4 Execution**

**4.1 VERIFICATION**

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria and provide verification of compliance.

**END OF SECTION**

### **35 31 24 – RUBBLE MOUND BREAKWATER**

#### **Part 1 General**

##### **1.1 MEASUREMENT PROCEDURES**

- .1 Armour stone will be measured in tonnes of material supplied and placed to the final dimensions indicated on the drawings and incorporated into the completed work and shall include all labour, equipment and materials necessary to complete the work.
- .2 Core stone will be measured in tonnes of material supplied and placed to the final dimensions indicated on the drawings and incorporated into the completed work and shall include all labour, equipment and materials necessary to complete the work.
- .3 New clear stone fill will be measured in tonnes of material placed to limits indicated and shall include all labour, equipment and materials necessary to complete the work.
- .4 Relocation of existing timber crib headblock shall be measured as a single fixed item and shall include all labour equipment and materials necessary to complete the work.  
Existing ballast stone to be removed and reinstalled as required.
- .5 Native fill will be measured as part of the lump sum arrangement and shall include all labour, equipment and materials necessary to complete the excavating, stockpiling and backfilling of native backfill.
- .6 Disposal of surplus native fill off site is considered included in item 1.1.3 above.
- .7 Weigh all stone placed in the Work at the quarry on a scale approved and certified as correct by the Department of Consumer and Corporate Affairs Weights and Measures Inspection Branch. Prior to use, have weigh scale certified as meeting requirements of Statutes of Canada, Chapter 36, Weights and Measures Act 1971 and subsequent amendments. Provide the Departmental Representative with a copy of the certificate and display certificate in prominent location. Costs for maintenance and operation of scale shall be considered incidental to the work.
- .8 Provide the Departmental Representative with weigh tickets at time of delivery to site.
- .9 Construction, maintenance and removal of haul roads are to be considered incidental to this work.

##### **1.2 SOURCE SAMPLING**

- .1 Inform Engineer of proposed source of materials and provide access for sampling at least 2 weeks prior to commencing work.

#### **Part 2 Products**

##### **2.1 MATERIALS**

- .1 Rock materials:
  - .1 Contractor to provide all materials.
  - .2 Armour stone:
    - .1 The largest dimension of each stone is not to exceed two times the smallest dimension.

- .2 Armour stone: 1.8 to 2.7 tonnes each by weight.
- .3 Stones are to be fractured and angular. Field stone is not acceptable.
- .4 The Armour stone is to be free from cracks, seams and other defects which may impair durability. The Los Angeles abrasion loss determined using ASTM procedures shall not exceed 35%. The armour rock shall be durable, blasted limestone or granite. Slate and shale are not acceptable.
- .3 Core stone:
  - .1 The largest dimension of each stone is not to exceed three times the smallest dimension.
  - .2 Quarry Run Core Stone: 2.7kg to 180kg each by weight, shovel run material for core, with 60 percent of the total volume to be at the midpoint of the specified size range, and not more than a maximum 5 percent content less than 25mm.
  - .3 Material is to be free of roots and other deleterious material.
- .4 Clear Stone: to Ontario Provincial Standard Specification 1004, size 19.0 mm, uniformly graded.
- .5 Native fill: excavated soil, free from roots and debris. Departmental Representative to approve excavated material before use as backfill.

## **Part 3 Execution**

### **3.1 EXCAVATING**

- .1 Demolish and remove existing concrete and timber portions of breakwater wharf in accordance with Section 02 41 00, prior to excavating native material.
- .2 Demolish and remove existing concrete and timber portions of launching ramp in accordance with Section 02 41 00, prior to excavating native material.
- .3 Excavate and stockpile native fill material that is suitable for reuse as core material in new breakwater and launch ramp. Unsuitable material is to be disposed of off-site.
- .4 Suitable native fill material is to be clear of all metals (i.e. Bollards, Tie Rods, Steel Sheet Piling Anchors, Wales, Metal Fastenings) and timber.
- .5 Excavate and stockpile existing armour stone from rock revetment berms as required.
- .6 Reinstall rock materials as indicated on drawings.

### **3.2 PLACEMENT OF CORE STONE**

- .1 Place core stone to lines, grades and dimensions as indicated on the drawings.
- .2 Place core stone in thickness courses to total layer thickness, as shown on the drawing.
- .3 Place core stone on a slope of 1.5 horizontal to 1 vertical
- .4 No allowance made for material placed outside specified limits

### **3.3 PLACEMENT OF ARMOUR STONE**

- .1 Place armour stone to lines, grades and dimensions as indicated on the drawings.
- .2 Place each armour stone in stable position.
- .3 Place armour stone in thickness courses to total layer thickness, as shown on the drawing.
- .4 Sort, fit and tightly key each rock to ensure stability of faces.
- .5 Placement not deemed acceptable must be removed and replaced

### **3.4 TOLERANCES**

- .1 Completed component layers to be within following tolerances of lines and grades as indicated:
  - .1 Armour: plus or minus 300 mm.
  - .2 Core: plus or minus 150 mm.

### **3.5 HAUL ROADS**

- .1 Be solely responsible for construction and maintenance of haul roads. Remove haul roads from site upon completion of project. No separate payment to be made for construction, maintenance and removal of haul roads.
- .2 The Contractor is to be responsible for obtaining approval from applicable agencies for using access roads to site.
- .3 The Contractor to repair any damage caused to roads or property as a result of hauling operations.

**END OF SECTION**

## **05 55 00 – METAL FABRICATIONS**

### **Part 1 General**

#### **1.1 REFERENCES**

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)
- .3 CAN/CGSB-1.40-[97], Anti-corrosive Structural Steel Alkyd Primer.
- .4 CAN/CGSB-1.181-[92], Ready-Mixed, Organic Zinc-Rich Coating.

Canadian Standards Association (CSA International)

- .5 CAN/CSA-G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel.
- .6 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.
- .7 CAN/CSA-S16.1-[01], Limit States Design of Steel Structures.
- .8 CSA W48-[01], Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
- .9 CSA W59-[1989(R2001)], Welded Steel Construction (Metal Arc Welding) (Imperial Version).

#### **1.2 DESCRIPTION**

- .1 This section specifies the requirements to fabricate and install the steel fabrications used for the concrete launch ramp to lines and grades as shown on plans or as established by Engineer.

#### **1.3 MEASUREMENT PROCEDURES**

- .1 New Steel Channel Sleepers will be measured by the linear meter as indicated on the drawings and shall include all labour, equipment and materials necessary to complete the work.

### **Part 2 Products**

#### **2.1 MATERIALS**

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W.
- .2 Welding materials: to CSA W59.
- .3 Welding electrodes: to CSA W48 Series.
- .4 Bolts and anchor bolts: to ASTM A307.

## **2.2 FABRICATIONS**

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

## **2.3 SHOP PAINTING**

- .1 Clean surfaces to be field welded; do not paint.

## **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.

### **3.2 STEEL SLEEPERS**

- .1 Confirm field dimension of length of each channel. Fabricate metal shapes in to detail indicated and length as determined by field measurements.
- .2 Install steel sleepers as indicated on drawings.

### **3.3 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.

**END OF SECTION**

