

**SPECIFICATIONS FOR
HARBOUR IMPROVEMENTS
BATCHAWANA, ONT**



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 work site described in this specification is Batchawana Wharf on Batchawana Bay. Batchawana Bay is located on the North Side of Lake Superior approximately 70 kilometres Northwest of Sault Ste. Marie, Ontario See Chart of Location on Drawing MA-01.
- .2 The work under this contract covers the following:
 - .1 The supply and installation of new core stone and shore protection stone
 - .2 The supply and installation of new gabion baskets
 - .3 Dredging of built up sand from launch ramp area
 - .4 Minor site improvements

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 5 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 Engineer and schedule updated by Contractor in conjunction with and to approval of 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 August 31, 2011.
- .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 MEASUREMENT FOR PAYMENT

- .1 Notify Engineer sufficiently in advance of operations to permit required measurements for payment.
- .2 Submit to Engineer, at least 7 days before Information for first application for payment, cost breakdown, Progress Payment in detail as directed by Engineer, for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications

for payment. After approval by Engineer, cost breakdown will be used as basis for progress payments.

1.5 **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.

1.6 **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 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 Engineer.
- .8 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.7 **EXISTING SERVICES**

- .1 Notify 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 Engineer 72 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions.
- .3 Establish location and extent of service lines in area of work before starting Work. Notify Engineer of findings.

- .4 Submit schedule to and obtain approval from Engineer for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .5 Where unknown services are encountered, immediately advise 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.

1.8 **DOCUMENTS REQUIRED**

- .1 Maintain at 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.

1.9 **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.

1.10 **PROJECT MEETINGS**

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

1.11 **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 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 Engineer's inspection of work.
- .6 Supply stakes and other survey markers required for laying out work.

1.12 **ADDITIONAL DRAWINGS**

- .1 Engineer may furnish additional drawings for clarification. These additional drawings have 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.

1.13 **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.

1.14 **DRAWINGS**

- .1 The following drawings are to be read in conjunction with this specification:
 - .1 MA-01

1.15 **DATUM**

- .1 Chart datum for Lake Superior is 183.20 metres I.G.L.D (1985).
- .2 Elevations and soundings shown on drawings are expressed in metres relative to chart datum.
- .3 Areas to be dredged are to be referenced to dredge limits on drawing and vertical bench marks as indicated.

1.16 **OVERLOADING**

- .1 No part of Work shall be loaded with load which will endanger its safety or will cause permanent deformation.
- .2 Repair to original condition any part of work damaged due to overloading at no cost to Engineer.

1.17 **TAXES**

- .1 Pay applicable Federal, Provincial and Municipal taxes.

END OF SECTION

01 35 29 – HEALTH AND SAFETY REQUIREMENTS

Part 1 General

1.1 REFERENCES

- .1 National Building Code 1995 (NBC):
 - .1 Part 8 Safety Measures at Construction and Demolition Sites Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .2 Province of Ontario
 - .1 The Occupational Health and Safety Act and Regulations for Construction Projects, revised statutes of Ontario 1990, Chapter 0.1 as amended, O.Reg. 213/91 as amended by O.Reg. 631/94, O.Reg. 143/99, O.Reg. 571/99, O.Reg. 145/00, O.Reg. 527/00. R.R.O. 1990, Reg. 834, O. Reg. 278/05 (Asbestos – Construction), O. Reg. 845/90 (Silica) as amended by O. Reg. 521/92 and O. Reg. 391/00.
 - .2 Workplace Safety and Insurance Act, 1997.
 - .3 Municipal statutes and authorities.
- .3 Fire Commissioner of Canada
 - .1 FC-301 Standard for Construction Operations
 - .2 FC-302 Standard for Welding and Cutting, June 1982.
Human Resources Development Canada Labour Program
Fire Protection Engineering Services
4900 Yonge Street 8th Floor
Willowdale, Ontario M2N 6A8
and copies may be obtained from:
Human Resources Development Canada
Labour Program Fire Protection Engineering Services
Ottawa, Ontario K1A 0J2

1.2 SUBMITTALS

- .1 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Plan must include
 - .1 Results of site specific safety hazard
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation.
 - .3 Measures and controls to be implemented to address identified safety hazards and risks.
 - .4 Provide a Fire and Safety Plan in accordance with NBC, subsection 8.2.3 prior to commencement of work. Deliver two copies of the Fire Safety Plan to the Engineer not later than 14 days before commencing work.
 - .5 Contractor's and Sub-contractors' Safety Communication Plan.
 - .6 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations.

- .2 Engineer will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor after receipt of plan. Revise plan as appropriate and resubmit plan to Engineer within 5 days after receipt of comments from Engineer.
 - .3 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.
 - .4 Submit copies of incident and accident reports.
 - .5 Submit records of Contractor's Safety Meetings when requested.
 - .6 Submit 2 copies of the Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, when requested.
 - .7 Submit copies of reports or directions issued by safety inspectors of authority having jurisdiction.
 - .8 Submit names of personnel and alternatives responsible for site safety and health.
 - .9 Submit WSIB – Workplace Safety and Insurance Board, Experience Rating Report for Province of Ontario.
 - .10 Submit Material Safety Data Sheets (MSDS) to Engineer.
- 1.3 **FILING OF NOTICE**
- .1 File of Notice of Project with Provincial authorities prior to commencement of work.
- 1.4 **WORK PERMIT**
- .1 Obtain permit related to project prior to commencement of work.
- 1.5 **SAFETY ASSESSMENT**
- .1 Perform site specific safety hazard assessment related to project.
- 1.6 **MEETINGS**
- .1 Pre-construction meeting: schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of work.
- 1.7 **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.
- 1.8 **PROJECT/SITE CONDITIONS**
- .1 Work at site will involve contact with Benzene in fuel oil.
- 1.9 **REGULATORY REQUIREMENTS**
- .1 Comply with Acts and regulations of the Province of Ontario.
 - .2 Comply with specified standards and regulations to ensure safe operations at site.

- .3 In event of conflict between any provisions of specified standards and regulations, the most stringent provision governs.

1.10 **GENERAL REQUIREMENTS**

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Relief from or substitution for any portion or provision of minimum Health and Safety Guidelines specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing. Departmental Representative will respond in writing, where deficiencies are noted and request resubmission with correction of deficiencies either accepting or requesting improvements.

1.11 **COMPLIANCE REQUIREMENTS**

- .1 Comply with Ontario Occupational Health and Safety Act. R.S.O. 1990 Chapter 0.1, as amended.

1.12 **RESPONSIBILITY**

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

1.13 **UNFORESEEN HAZARDS**

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

1.14 **POSTING OF DOCUMENTS**

- .1 Provide documents as follows and post on site in a conspicuous location:
 - .1 Contractor's Safety Policy
 - .2 Constructor's Name
 - .3 Health and Safety Representative's name
 - .4 Ministry of Labour Orders for Province of Ontario
 - .5 Occupational Health and Safety Act for Province of Ontario
 - .6 Material Safety and Data Sheets
 - .7 Safety Plans
 - .8 Notice of Project

- .9 Joint Health and Safety Committee Members (where required)
- .2 Comply with Provincial general posting requirements
- 1.15 **CORRECTION OF NON-COMPLIANCE**
 - .1 Immediately address health and safety non-compliance issues identified by Departmental Representative and regulatory agency having jurisdiction in the Province.
 - .2 Provide Departmental Representative with written report of action taken to correction-compliance of health and safety issues identified.
 - .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.
- 1.16 **WORK STOPPAGE**
 - .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
 - .2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Health and Safety Coordinator's Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.
- 1.17 **BLASTING**
 - .1 Blasting or other use of explosives is not permitted.
- 1.18 **POWDER ACTUATED DEVICES**
 - .1 Use powder actuated devices only after receipt written permission from Engineer.
- 1.19 **WORK STOPPAGE**
 - .1 Give precedence to safety and health of public and site personnel and protection of environmental over cost and schedule considerations for Work.
 - .2 Assign responsibility and obligation to competent Supervisor to stop or start work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Engineer may also stop work for health and safety considerations.

END OF SECTION

01 35 43 – ENVIRONMENTAL PROCEDURES

Part 1 General

1.1 GENERAL

- .1 The material to be dredged is classified sand and is not contaminated

1.2 MEASUREMENT FOR PAYMENT

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

1.3 FIRES

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

1.4 DISPOSAL OF MATERIALS

- .1 A designated disposal location (side-cast) of the dredged material will be provided on the beach adjacent to the East Pier
- .2 Use of a bulldozer may be required at the disposal location for levelling and grading.
- .3 If work is completed on snow covered ground, the area shall be first cleared of snow and ice before placing material in designated area.

1.5 DISPOSAL OF WASTES

- .1 Do not bury rubbish and waste materials on site unless approved by Departmental Representative.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 All waste materials including containers and waste fluids associated with the vehicle maintenance shall be disposed of in a legal manner at a site approved by Local Authorities.

1.6 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only.
- .2 Do not use waterway beds for borrow material.
- .3 Waterways to be free of excavated fill, waste material and debris.
- .4 Design and construct temporary crossings to minimize erosion to waterways.
- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid damage to shoreline.
- .7 Supply, install, and maintain approved erosion control blankets to unprotected slopes until re-vegetation is established.

- .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.

1.7 **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.

1.8 **COOPERATION AND 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 Repair and clean existing structures, roads, beaches or other facilities damaged or fouled by the work. Complete repairs and clean up at no additional expense to Engineer. Repairs made to damaged existing work to equal or better than original.

END OF SECTION

01 52 00 – TEMPORARY FACILITIES

Part 1 General

1.1 ACCESS

- .1 Provide and maintain adequate access to and exit from project site.
- .2 Provide snow removal for temporary access throughout the period of work, if applicable
- .3 If authorized to use wharf for access to project site, maintain such protection for duration of Contract and make good any damages resulting from Contractor's use.
- .4 Make good damage to any existing land, roads, vegetation or structures resulting from Contractor's equipment and operations. Restore to original condition at no additional cost to Engineer.

1.2 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in Facilities accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.3 REMOVAL OF TEMPORARY FACILITIES

- .1 Remove temporary facilities from site upon completion of work unless otherwise directed by Engineer.

D OF SECTION

01 77 00 – CLOSEOUT PROCEDURES

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .2 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Engineer.
 - .2 When Work incomplete according to Engineer, complete outstanding items and request re-inspection.
 - .3 Final Payment:
 - .1 When Engineer considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
 - .4 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 FINAL CLEANING

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

END OF SECTION

35 20 23 – DREDGING

Part 1 General

1.1 DEFINITIONS

- .1 The following defines the terminology used in this specification.
- .2 Dredging: excavating, transporting and disposing of underwater materials
- .3 Class A material: solid rock requiring drilling and blasting to loosen, and boulders or rock fragments of individual volumes of 1.5 cubic metres or more.
- .4 Class B material: loose or shale rock, silt, sand, quick sand, mud, shingle, gravel, clay and sand, gumbo, boulders, till, debris or and material not specified under Class A.
- .5 Obstructions: class of material greater than 1.5 cubic metres that is not included in this specification.
- .6 Debris: pieces of wood, wood fibre, logs, wire rope, tires, scrap steel, pieces of concrete and other waste materials.
- .7 Grade: plane above which all material is to be dredged.
- .8 Side slope: inclined surface from grade depth at side limit of dredging area to intersect original ground line outside of dredging area and to be expressed as a ratio of horizontal to vertical.
- .9 Estimated quantity:
 - .1 Area in square metres of material calculated horizontally to exist above grade and within dredge limits, unless otherwise specified.
- .10 CMPM: cubic metres place measurement at dredging site.
 - .1 CMSM: cubic metres scow measurement.
 - .2 SQM: area in square metres projected on horizontal.
- .11 Box cut: dredging channel area with vertical side slopes and allowing side slope of excavation collapse to a natural equilibrium slope.
- .12 Cleared areas: areas of dredging accepted as complying with plans and specifications.
- .13 Mechanical sweep: clearing all the dredged areas to the grade depth using a mechanical device suspended from a barge.
- .14 Chart datum: permanently established plane from which soundings or tide heights are referenced.
- .15 Coordinates:
 - .1 U.T.M.: universal transverse Mercator projection.
 - .2 M.T.M.: modified transverse Mercator projection.
 - .3 U.T.M. or M.T.M. Coordinates: plane rectangular coordinates used in grid system in which grid network is applied to U.T.M. or M.T.M. projection. Horizontal control information as indicated.

- .16 Minimum mode: mode of operation of hydrographic survey equipment where minimum sounding over length of travel between position updates will be retained in memory.
- .17 Matrix block: each dredge area is presented as a number of blocks. Each block may contain a variable number of soundings depending upon survey coverage.
- .18 Least of minimum plan: hydrographic survey plan in which least sounding in grouping of matrix blocks is plotted.
- .19 Instantaneous mode: mode of operation of hydrographic survey equipment where only sounding observed at predetermined distance interval is retained in memory.
- .20 Average of instantaneous plan: hydrographic survey plan in which average sounding in an appropriate group of matrix blocks is plotted.
- .21 Mechanical dredging plant: equipment that is comprised of the following - clamshell, dragline, dipper or backhoe dredge with dump scows.
- .22 Hydraulic dredging plant: equipment that uses the movement of water to excavate and transport underwater materials such as: cutter suction dredger, suction dredger or trailing suction hopper dredger.

1.2 LOCATION

- .1 Work comprises dredging of the following areas as indicated:
 - .1 Area 'A' in the launch ramp area, on the inside face of the wharf

1.3 INTERFERENCE TO NAVIGATION

- .1 Plan and execute work in manner that will not interfere with fishing operations, marina operations, construction activities at wharf sites, or access to wharves by land or water.
- .2 Make no claim for delays resulting from the above.
- .3 Engineer will not be responsible for loss of time, equipment, material or any other cost related to interference with moored vessels in harbour or due to other Contractor's operations.

1.4 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Mark floating equipment with lights in accordance with the Collision Regulations with the Canadian Modifications, 1983, and maintain a VHF marine radio watch of board.

1.5 SITE INFORMATION

- .1 Material to be dredged consists of Class 'B' material.
- .2 Batchawana Harbour has been previously dredged to grade depth. Material to be dredged generally consists of silt, silty sand.

1.6 MEASUREMENT PROCEDURES

- .1 Area 'A' consists of infilled sand from the nearshore area. This material has formed a shoal on the inner leg of the wharf, adjacent to the launch ramp. We estimate the quantity to be roughly 200 CPM. Costs for dredging shall be included in the Lump Sum arrangement.
- .2 Additional dredging/ sand extraction is required on the outer leg of the wharf under the proposed rock mattress/ gabions as noted in the section and elevation drawings.

- .3 Mobilization and Demobilization of dredging equipment. Removal and disposal of dredged material, include all machinery required to grade the materials at the beach (disposal location), and site clean-up shall be considered incidental to this work.

1.7 **DREDGING PLANT**

- .1 Contractor to determine required equipment necessary to excavate material specified and to dispose of excavated material.

Part 2 Execution

2.1 LAYOUT OF WORK

- .1 The Engineer will meet with the Contractor and his survey staff to identify the established horizontal control consisting of a baseline, coordinate system with reference control monuments and vertical control benchmarks to define the work and disposal areas.
- .2 Dredge Batchawana Harbour Area 'A' to a grade depth of 2.1 metres below chart datum

2.2 DISPOSAL OF DREDGED MATERIALS

- .1 Dispose of dredged material from areas A, by depositing at the adjacent beach site
- .2 See drawing for details. Limits of disposal area to be verified on site prior the start of work. Restrict disposal activities to those areas indicated.

2.3 DISPOSAL OF DEBRIS

- .1 Do not dispose of debris in harbour
- .2 Dispose of debris in containment facility identified or at approved land disposal site.

2.4 CO-OPERATION AND ASSISTANCE TO ENGINEER

- .1 Cooperate with Engineer on inspection of work and provide assistance requested.
- .2 Furnish use of such boats, equipment, labour and materials forming ordinary and usual part of dredging plant as may be reasonably necessary to inspect and supervise work.

2.5 MONITORING OF WORK

- .1 Contractor is responsible to monitor effectiveness and productivity of his own work on an ongoing basis.
- .2 The contract administrator will monitor work as required to ensure work is being carried out as per the contract documents.

2.6 SWEEPING AND ACCEPTANCE OF WORK

- .1 Sweep entire dredged area in one continuous operation on completion of dredging to confirm that grade depth has been achieved.

2.7 FINAL CLEANING

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

END OF SECTION

31 53 13 – HARBOUR IMPROVEMENT WORK

Part 2 General

2.1 MEASUREMENT PROCEDURES

- .1 Measure gabions in cubic metres of stone filled baskets incorporated into Work.
- .2 Costs for Gabion baskets supplied and placed to the final dimensions indicated on the drawings shall include all labour, equipment and materials necessary to complete the work.
- .3 Deck Boards will be measured by each unit removed and replaced and shall include all labour, equipment and materials necessary to complete the work.
- .4 Rock Mattress 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.
- .5 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.
- .6 Disposal of surplus native fill can be placed in the designated dredging disposal area and 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.

2.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A313/A313M-[98], Standard Specification for Stainless Steel Spring Wire.
 - .2 ASTM A764-[95(2001)], Standard Specification for Metallic Coated Carbon Steel Wire, Coated at Size and Drawn to Size For Mechanical Springs.
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

2.3 QUALITY ASSURANCE

- .1 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.
- .2 Worker protection:

- .1 Workers must wear gloves, eye protection and protective clothing when handling, drilling, sawing or cutting preservative treated wood and applying preservative materials.
- .2 Workers must not eat, drink or smoke while applying preservative material.
- .3 Clean up spills of preservative materials immediately with absorbent material. Safely discard of absorbent material to approved landfill.

2.4 WASTE MANAGEMENT

- .1 Do not dispose of preservative treated wood through incineration.
- .2 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
- .3 Dispose of treated wood, end pieces, wood scraps and sawdust at an approved landfill.

Part 3 Products

3.1 MATERIALS

- .1 Gabion baskets:
 - .1 Factory fabricated so that sides, ends, lid and internal diaphragms can be readily assembled at site into rectangular baskets of sizes as indicated.
 - .2 Single unit construction or with joints having strength and flexibility equal to that of mesh.
 - .3 Provide diaphragms of same mesh as gabion walls, when length exceeds horizontal width. Diaphragms to divide basket into equal cells of length not to exceed horizontal width.
 - .4 Wire mesh gabions:
 - .1 Wire mesh: uniform hexagonal pattern wire woven in [triple] twist pattern with openings of approximately 80 x 100 mm, non-ravelling.
 - .2 Securely selvedge perimeter edges to form joints connecting selvedges with same strength as mesh body.
 - .3 Wire to have following dimensions:
 - .1 Mesh: 3.0mm diameter.
 - .2 Selvedges: 3.8mm diameter.
 - .3 Binding: 2.0mm diameter.
 - .4 Wire: hot dip galvanized with minimum coverage of 260 g/m² to CAN/CSA G164.
 - .5 Interlocking wire fasteners: galvanized steel to ASTM A764, finish 1, class 1, type 3
- .2 Rock materials:
 - .1 Material to be transported to site. Source of material to be approved by Engineer.
 - .2 Armour stone:
 - .1 Greatest dimension of each stone not to exceed two times least dimension.
 - .2 Stone sizes to be in range of 300mm to 600mm. Armour rock to be fractured and angular. Field stone not acceptable.

- .3 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. Slate and shale not acceptable.
- .3 Gabion Stone and Rock Mattress to the following requirements:
 - .1 Stone, consisting of hard durable particles free from clay lumps, organic material and other deleterious materials.
 - .2 Gabion stone supplied to be well graded with maximum size not exceeding 200 mm and minimum size to be not less than 150 mm.
 - .3 Crushed rock mattress: 100 mm minus.
- .4 Replacement Deck Boards to the following requirements:
 - .1 To National Lumber Grades Authority Standard Grading Rules for Canadian Lumber effective March 1, 2007, species and grade category as follows:
 - .2 New 64x140 Replacement Decking: pressure treated, S-P-F "No. 2" or better, Structural Joists and Planks, S4S
 - .3 Deck screws: to AISI, stainless steel, Type 305.

Part 4 Execution

4.1 PREPARATION

- .1 Confirm existing measurements on site and confirm materials supply is sufficient. Inform engineer of any measurement discrepancies present.

4.2 TIMBER DECKING

- .1 Remove damaged deck boards (2)
- .2 Space deck planks 4 mm apart. Secure planks to underlying stringers with two screws to length and depth indicated on drawings. Drive 2 screws at each point of contact. Drive all screws 3 mm below top of deck planks.

4.3 EXCAVATING

- .1 Excavate and stockpile native armour stone that is suitable for reuse as armour material in new work. Reinstall rock materials as indicated on drawings.
- .2 Prepare lakebed to receive new rock mattress.
- .3 Dredge, in accordance with Section 35 20 23 – Dredging in area where mattress is to be placed to elevation as indicated

4.4 INSTALLATION

- .1 Install gabions to lines and grades as indicated. Follow manufacturer's instructions in assembling baskets.

4.5 **PLACING GABIONS**

- .1 Wherever possible, place baskets in position prior to filling with stones on a levelled rock mattress base.
- .2 Join adjacent baskets together at corners as recommended by manufacturer, to ensure joints are as strong as mesh.
- .3 For underwater placement, prefill gabions. Provide special devices to handle filled baskets and mats without distortion and to place them in position. Connect adjacent gabions together when in place using a diver.

4.6 **FILLING BASKETS AND MATS**

- .1 On exposed faces of gabions, place stones by hand with flattest surfaces bearing against face mesh to produce satisfactory alignment and appearance.
- .2 For wire mesh gabions, fill gabion cells in lifts not to exceed 300 mm and connect opposite walls with two tie wires after each lift.

4.7 **PLACEMENT OF ROCK MATTRESS**

- .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.

4.8 **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
- .6 No allowance made for material placed outside specified limits

4.9 **TOLERANCES**

- .1 Completed component layers to be within following tolerances of lines and grades as indicated:
 - .1 Armour: plus or minus 150 mm.
 - .2 Rock Mattress : plus or minus 100mm

35 31 26 – CONCRETE WHARF WORK

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 All Concrete including saw-cuts, shall be measured by the cubic meter supplied and installed and shall include all labour, materials, and equipment necessary to complete the work.
- .2 Seat Angles, Reinforcing steel, 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 Geotextile placed will be measured in square metres of surface covered by material based on the neat plan area and shall include all labour, materials and equipment necessary to complete the work. No allowance will be made for seams and overlaps.
- .4 Heating water, aggregates and providing cold weather protection considered included in the installation of concrete and will not be measured separately for payment.
- .5 Re-grading of existing clear stone base including compaction will be considered incidental to the new concrete parapet and will not be measured separately for payment.

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 CONCRETE BASE PREPARATION

- .1 Grade and compact existing stone base prior to placement of reinforcement. Supply place and compact clear stone to fill low areas exposed after the demolition of the existing concrete slabs and after compaction of the existing base,
- .2 Compact existing base and clear stone to 98% Standard Proctor

3.2 PLACING REINFORCEMENT

- .1 Accurately place steel angles and 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/CSAA23.1/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

