

**SPECIFICATIONS FOR
BREAKWATER AND WHARF STONE PROTECTION REPAIRS
COLCHESTER, 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 Colchester Marina in Colchester Ontario. Colchester is located at the north side of Lake Erie in the western basin approximately 35km west of Leamington Ontario.
- .2 The work under this contract covers:
 - .1 Regrading and Reinstatement of existing core stone and armour from breakwater washout and from stone protection adjacent to main wharf.
 - .2 The placement of new core stone and armour stone as required to repair the areas indicated on the attached plan MA-01.
- .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 SITE ACCESS

- .1 Provide and maintain adequate access to and exit from project site.
- .2 If authorized to use existing roads for access to site, maintain such roads for duration of Contract and make good any damages resulting from Contractor's use of roads.
- .3 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.
- .4 Access to the Breakwater repair location from the proposed laydown area can be accomplished if the Contractor completes the following:

- .1 Provide temporary supports for accessing barge from the laydown area.
- .5 Following construction, the Contractor will be responsible to repair any such damage which was not recorded during the pre-construction survey.

1.11 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.

1.12 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 West Breakwater and Wharf Stone Protection Repairs

1.23 DATUM

- .1 Elevations and soundings shown on Drawings are expressed in metres relative to chart datum.
- .2 Chart datum for Lake Erie is 173.5 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 may not enter the lake.
- .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 Construction equipment will enter and leave the project site at such a location and in such a manner that disturbance to the lakeshore is minimized.
- .4 Every effort will be made to minimize the introduction of sediment to the lake during work activities.
- .5 Do not use waterway beds for borrow material.
- .6 Waterways to be free of excavated fill, waste material and debris.
- .7 Design and construct temporary crossings to minimize erosion to waterways.
- .8 Do not skid logs or construction materials across waterways.
- .9 Avoid damage to the shoreline.
- .10 Supply, install, and maintain approved erosion control blankets to unprotected slopes until revegetation is established.

- .11 Any impacts below the 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.
- .12 Reclaim and restore disturbed areas to previous or better condition.
- .13 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.
- .14 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.
- .15 The Contractor shall report spills of fuels or other contaminants to the Engineer.
- .16 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.
- .17 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. The Contractor shall not use chemical dust suppressant materials on roads within 100 metres of the construction site.
- .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. The Contractor to ensure all equipment operating on project is free of external fluid leaks, grease, oil, and mud.
- .6 The Contractor is 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.

1.6 DISPOSAL OF WASTES

- .1 Do not bury rubbish and waste materials on site.

- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways.
- .3 Hazardous wastes including fuels, oils and lubricants must be disposed of by a licensed hazardous waste carrier/handler in accordance with Provincial Environment Legislation.
- .4 Collect all rubbish and waste material and dispose of in accordance with applicable governing authorities.
- .5 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.
- .6 Do not allow debris of any type to enter waterway.

1.7 PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties.
- .2 Avoid disturbance of topsoil and vegetation unless otherwise specified. The 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.

1.8 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. An acceptable product is "Tough Guy" Type 1E Turbidity Barrier or approved equivalent. Costs for supply, installation, maintenance, and removal will be considered part of the lump sum arrangement.
- .2 Construction shall be monitored to ensure that the mitigation measures are effective at containing the sediment to the launch ramp construction area. Adjustments may have to be made to get the containment to function 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.

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 Contract met, make application for final payment.
 - .4 Payment of Holdback:
 - .1 After issuance of Certificate of Substantial Performance of Work, submit 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

35 31 24 – RUBBLE MOUND BREAKWATER AND SHORE PROTECTION

Part 1 General

1.1 MEASUREMENT PROCEDURES

- .1 Mobilization and Demobilization of equipment will be measured as part of the Lump Sum arrangement (LS).
- .2 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.
- .3 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.
- .4 Regrading of existing rock 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.
- .5 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.
- .6 Provide the Departmental Representative with weigh tickets at time of delivery to site.
- .7 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: 3.0 to 5.0 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 Core Stone: 250kg to 1.0 tonne 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.
 - .3 Material is to be free of roots and other deleterious material.

Part 3 Execution

3.1 EXCAVATING

- .1 Regrade existing armour and core stone from breakwater as required.
- .2 Excavate and stockpile native fill material that is suitable for reuse as core material in rehabilitated sections of breakwater and wharf stone protection. Unsuitable material is to be disposed of off-site.
- .3 Reinstall rock materials as indicated on drawing MA-01.

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

