



Public Works and Government Services Canada

Requisition No. EZ899-140005/B

MERX I.D. No. _____

SPECIFICATIONS
for

**Transport Canada Airport
Erosion Protection**

Project No. R. 048882.001 June 2013

APPROVED BY:



Regional Manager A&E June 10, 2013
Date



Construction Safety Coordinator 07 June 2013
Date

TENDER:



Project Manager 13/06/11
Date

SPECIFICATIONS

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PART 1 GENERAL

1.1 Section Includes

- .1 Location of site.
- .2 Site conditions.
- .3 Preconstruction survey
- .4 Work covered by contract documents.
- .5 Time of completion.
- .6 Use of site.

1.2 Precedence

- .1 Division 1 Sections take precedence over technical specification sections in other Divisions of these Project Specifications.

1.3 Site Conditions

- .1 Make inquiries or investigations necessary to become thoroughly acquainted with site, soil, climatic, tidal conditions, and site access along with the nature and extent of the work before submitting tender.
- .2 Submission of a tender will be deemed confirmation that the Contractor is familiar with the site and is conversant with all relevant conditions.
- .3 All known discrepancies are to be brought to the attention of the Departmental Representative and are to be accounted for in the Contractor's Bid Price.
- .4 Construction conditions by the Department of Fisheries and Oceans (DFO) apply to onsite construction works conducted within the tidal zone. Documents identifying these conditions are included in Appendix C. The Contractor is expected to be familiar with, and comply with any and all conditions identified in these documents throughout construction.

1.4 Location of Site

- .1 The work is located at Sandspit Airport, Sandspit, B.C. The revetment structure is located at Spit Point on Hecate Channel, as shown on the Plans.

1.5 Work Covered by Contract Documents

- .1 Work to be performed under this contract shall consist of

furnishing all plant, tools, equipment, materials, supplies, and manufactured articles and furnishing all labour, transportation and services, including fuel, power, water, and essential communications, and performing all work, or other operations required for the fulfillment of the contract in strict accordance with the Contract Documents. The work shall be complete, and all work, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete and proper construction of the work in good faith shall be provided by the contractor as though originally so indicated, at no increase in cost to the owner. The principal works to be executed and for which all materials, plant and labour are to be supplied by the Contractor as shown on the plans and in the specifications:

- .1 Excavate existing revetment materials and in-situ soils to design elevations
- .2 Stockpile and reuse existing revetment materials meeting specifications
- .3 Supply and install underlayer material
- .4 Supply and install revetment armour material
- .5 Backfill and grade excavated materials

1.6 Preconstruction Survey

- .1 A preconstruction survey will be carried out by the Departmental Representative following contract award in order to establish the existing ground surface for the purposes of measurement throughout construction. It is expected there may be alignment and quantity adjustments to the Plans following the preconstruction survey. No contractor claims for changed site conditions will be accepted for these modifications.

1.7 See Section References

- .1 National Research Council of Canada (NRC):
- .2 See Section 01 35 33 for additional references.

1.8 Codes and Standards

- .1 Perform work in accordance with the Contract Documents, the Canada Labour Code, Part II, Workers' Compensation Board of B.C., and any other code of federal, provincial or local application provided that, in any case of conflict or discrepancy, the most stringent requirements shall apply.
 - .2 Meet or exceed requirements of specified standards, codes and
-

referenced documents.

1.9 Documents Required

- .1 Maintain at job site one copy of the following:
 - .1 Contract documents and approved shop drawings
 - .2 Specifications
 - .3 Addenda
 - .4 Change orders
 - .5 Other modifications to contract
 - .6 Copy of approved work schedule
 - .7 Health and Safety Plan and Fire Safety plan
 - .8 Environmental Emergency Response Plan (including Spill Response Plan)
- .2 Department Representative may furnish additional drawings to assist proper execution of work. These documents will be issued for clarification only. Such documents will have the same meaning and intent as if they were included in the plans referred to in the Contract documents.

1.10 Record Drawings

- .1 As work proceeds, maintain accurate records to show progress, and all deviations from the contract drawings. Note on as-built drawings as changes occur, and at completion supply one set of all drawings and specifications clearly marked.

1.11 Geotechnical Data

- .1 Geotechnical data was not prepared for this project.

1.12 Datum

- .1 All design elevations used in the drawings and specifications refer to Geodetic Survey of Canada (GSC) datum, with a GSC elevation of -4 meters representing an elevation of 0.0 in Canadian Hydrographic Service (CHS) datum.
- .2 For the purposes of this Contract, lower low water datum at Sandspit is -4.0 meters GSC (0.0 meters CHS).

1.13 Layout of Work

- .1 Lay out work on the ground and execute the work to the Departmental Representative's satisfaction.

1.14 Time of Completion

- .1 Complete work by October 15, 2013. Onsite construction work window to be September 5, 2013 – October 15, 2013.

1.15 Work Schedule

- .1 Within 7 days of Contract award, provide a schedule of work. Observe the following requirements:
 - .1 Whenever a variation from the schedule in excess of 5 working days occurs or is expected to occur, notify Departmental Representative of the change.
 - .2 Notify regulatory authorities as indicated below:
 - .1 Notify the local Fisheries Officer and the Regional Director, Environmental Services Branch, no less than 5 days before start and completion of operations.
 - .2 Notify Transport Canada of the project schedule at least 5 working days prior to the commencement of work.

1.16 Use of Site

- .1 Coordinate all work onsite with Departmental Representative and make arrangements to ensure construction equipment work onsite is properly coordinated with flight timing and closures.
- .2 Hours of work.
 - .1 Perform work at most advantageous times to avoid disruptions to airport operations.
 - .2 Work may be performed at all times of the day and on weekends and holidays as coordinated with airport operations personnel and Departmental Representative.

1.17 Project Meetings

- .1 The Departmental Representative will arrange project meetings and assume responsibility for setting times. Contractor to be responsible for recording and distributing minutes.

1.18 Location of Equipment

- .1 No equipment will be permitted to remain onsite unattended. Nearest location of staging area is to be coordinated with Departmental Representative and airport personnel.

1.19 Armour Riprap and Underlayer Material

- .1 Supply, Transport and Stockpiling
 - .1 Transport material to the site in coordination with instructions from Departmental Representative as

coordinated with airport personnel regarding acceptable accessways.

- .2 There will be no stockpiling of materials on the work site. All materials are to be brought to site and placed as needed. At no time will the placed materials be left in a position above 5.1 m within the strip and obstacle clearance limits.”

- .2 Construction Equipment and Plant:

- .1 On request, prove to the satisfaction of Departmental Representative that the construction equipment and plant are adequate to manufacture, transport, place and finish products to quality required and at a rate capable of meeting submitted schedule. If inadequate, replace or provide additional equipment or plant as directed.
- .2 Maintain construction equipment and plant in good operating order.

1.20 Testing and Inspection Services

- .1 Particular requirements for inspection and testing to be carried out by testing service or in laboratory approved by Departmental Representative are specified under various sections.
- .2 Contractor will provide support, appoint and pay for services of testing the following:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Rock hardness, density, sulfate soundness, absorption and competency tests to be certified by a qualified laboratory.
 - .3 Supply and manipulation of representative revetment armour stones in Contractor’s quarry or yard to allow Departmental Representative to verify dimensions.
 - .4 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.
 - .5 Additional tests specified in paragraph following.
- .3 Where tests or inspections performed by the testing service reveal work is not in accordance with the contract requirements, Contractor shall pay costs for additional tests or inspections as Departmental Representative may require to verify acceptability of corrected work.
- .4 Provide Departmental Representative with two (2) copies of testing laboratory reports as soon as they are available.

1.21 Interpretation

- .1 In interpreting the Contract, in the event of discrepancies or conflicts between anything in the Plans and Specifications and the General Conditions, the General Conditions govern.
- .2 In interpreting the Plans and Specifications, in the event of discrepancies or conflicts between:
 - .1 The Plans and Specifications, the Specifications govern;
 - .2 The Plans, the Plans drawn with the largest scale govern; and
 - .3 Dimensions, no scaled dimensions are to be used in calculations, the figured dimensions govern.

1.22 Completion

- .1 Contractor to submit a written statement to the Departmental Representative as specified in Section 01 77 00 – Closeout Procedures.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-END OF SECTION-

PART 1 GENERAL

1.1 General

- .1 This Section specifies general requirements and procedures for the Contractor's submissions of shop drawings, product data, samples and other requested submittals to Departmental Representative for review.
- .2 Present shop drawings and product data in SI Metric units.
- .3 Where items or information is not produced in SI Metric units, converted values are acceptable.
- .4 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submissions.
- .5 Submit three paper sets and a CD with PDF documents to the Departmental Representative.
- .6 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract documents and stating reasons for deviations.
- .7 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Departmental Representative's review of submission unless Departmental Representative gives written acceptance of specific deviations.
- .8 Make any changes in submissions which Departmental Representative may require consistent with Contract documents and resubmit as directed by Departmental Representative.
- .9 Notify Departmental Representative in writing, when resubmitting, of any revisions other than those requested by Departmental Representative.
- .10 Do not proceed with work until relevant submissions are reviewed and approved by the Departmental Representative.

1.2 Submission Requirements

- .1 Coordinate each submission with the requirements of the work and the Contract documents. Individual submissions will not be reviewed until all related information is available.
- .2 Allow (5) five days for Departmental Representative's review of each submission, unless noted otherwise.
- .3 Accompany submissions with transmittal letter, containing:
 - .1 Date.

- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each submittal
- .5 Other pertinent data.
- .4 Submissions to include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative, certifying approval of submissions, verification of field measurements and compliance with Contract documents.
 - .5 Details of appropriate portions of work as applicable.
 - .1 Layout, showing dimensions (including identified field dimensions) and clearances.
 - .2 Capacities.
 - .3 Standards.
 - .4 Operating weight.
 - .5 Single line and schematic diagrams.
 - .6 Relationship to adjacent work.
 - .6 After Departmental Representative's review, distribute copies.

1.3 Shop Drawings

- .1 Shop drawings: original drawings or modified standard drawings provided by Contractor to illustrate details of portion of work which are specific to project requirements.
- .2 Maximum sheet size: 850 x 1050 mm.
- .3 Submit 3 prints of shop drawings and a CD with PDF documents for each requirement requested in the specification sections and/or as requested by the Departmental Representative.
- .4 Cross-reference shop drawing information to applicable portions of the Contract documents.

1.4 Review of Submittals

- .1 Review of submittals by Public Works and Government Services Canada is for the sole purpose of ascertaining conformance with the general concept.
- .2 This review does not mean that Public Works and Government

Services Canada approves the detail design inherent in the submittals, responsibility for which remains with Contractor submitting same.

- .3 This review will not relieve the Contractor of responsibility for errors or omissions in the submittals or of responsibility for meeting all requirements of the construction and Contract documents.
- .4 Without restricting the generality of the foregoing, the Contractor is responsible for:
 - .1 Dimensions to be confirmed and correlated at the job site.
 - .2 Information that pertains solely to fabrication processes or to techniques of construction and installation.
 - .3 Coordination of the work of all sub-trades.

1.5 Progress Schedule

- .1 Submit work schedule as required in Section 01 11 55.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-END OF SECTION-

PART 1 GENERAL

1.1 General and Scheduling

- .1 Do not disrupt airport operations except as allowed by previous coordination with Departmental Representative and Sandspit Airport.
- .2 Throughout the period of the work, the airport will remain open and fully operational. Construction operations must accommodate all planned and unplanned airport operations.
- .3 Construction operations may proceed up to seven (7) days per week and at anytime of day or night, as scheduled by the Contractor to most efficiently take advantage of tides and scheduled flights.
- .4 Exact construction dates and times to be coordinated between Contractor, Departmental Representative, and Sandspit Airport prior to commencement of construction operations.
- .5 Do not disrupt airport operations except as coordinated with Departmental Representative and scheduled into construction sequence.

1.2 Scheduled Flights

- .1 A compilation of scheduled flights during the expected work period is attached to the end of this specification.

1.3 Coordination of Movements in Operational Area

- .1 Brief Departmental Representative no later than 1600 hours every day on next day's planned work and proposed construction equipment and vehicular traffic activities prior to starting work in area adjacent to or on active aerodrome facilities.

1.4 Airside Escort Requirements

- .1 Contractor to provide a full-time Airside Escort during all work on Sandspit Airport property.
- .2 Airside Escort to complete training by Sandspit Airport prior to beginning operations.
- .3 Airside Escort to obtain the following certificates and permits prior to beginning operations:
 - .1 Restricted Radio Operator's Certificate (Aeronautical)
 - .2 Airside and Vehicle Operators' Permit obtainable through training by Sandspit Airport.
- .4 Radios must be mounted in Airside Escort's vehicle. The radios will be provided by Sandspit Airport.

1.5 Flight Safety

- .1 Prior to allowing personnel to cross active runways, taxiways, aprons, or when working within 60 meters of an active facility, Airside Escort to establish contact with Flight Service Station (FSS) and obtain specific clearance. Once established on airfield, maintain radio contact with Sandspit Airport at all times.
- .2 Vehicles and equipment used on the airfield must be equipped with 360 degree rotating amber beacons, or must be escorted by a vehicle equipped with such a beacon. Escorted vehicle must have 4-way emergency flashers on.
- .3 Foreign Object Debris (FOD) control protocol will be strictly enforced by the Site Representative at all times in the construction and operational area.
- .4 Contractor to maintain cleaning equipment at the construction site for FOD control and cleanup of all runway, taxiway, and apron operational surfaces affected by construction activities. Site FOD inspections and sweeps are to be conducted at the end of each working day, prior to evacuating the site, or any time when FOD objects originating from construction activities are noticed to be present on restricted areas.

1.6 Construction Equipment

- .1 All power tools, internal combustion engines, and equipment used for work on this project to be equipped with suppressors to eliminate interference with airfield radio and telecommunications equipment.

1.7 Movement of Equipment and Personnel on Airport Property

- .1 Airside Escort to coordinate, schedule, and control all construction equipment movements.
- .2 Obey signals from Flight Service Station instantly.

1.8 Evacuation

- .1 When evacuating site, the Contractor is to follow Flight Safety Procedures in Section 1.5, turn off all site construction lighting, and remove all equipment and material to an elevation below site requirements. Evacuation may be either along the access route to a location outside the flight glide path, or to the beach, with all equipment, material and personnel outside the runway lines and below the elevation of 5.1 meters.
- .2 The Contractor is to evacuate the work site within thirty (30) minutes of a request by Airport Authorities.

- .3 Contractor is to evacuate the site for all scheduled flights. Evacuation time to be 20 minutes prior to flight landing or takeoff, and 5 minutes following. All delayed flights in which notification and updated schedule is provided to the Contractor one hour or more before the scheduled takeoff or arrival will not be considered an unscheduled stoppage of work.
- .4 **Unscheduled Stoppage of Work:**
 - .1 May occur as a result of observance by the Contractor of airport operational requirements for unscheduled flights or emergencies. When unscheduled stoppages exceed one hour in aggregate in any one day, the Contract Sum will be increased by the amount of any direct expense incurred by the Contractor, as reviewed by the Departmental Representative, for the aggregate period (including the first hour) in respect of plant and labour rendered idle and not employable on the site. No payment will be admitted in respect of any other consequential costs, losses or expenses.
 - .2 Submission for reimbursement of such expenses must be supported by detailed and duly authenticated records prepared by the Contractor, which must be countersigned by the Departmental Representative. The Site Representative must be notified at the commencement and on cessation of each period of work stoppage admissible under this Clause.
 - .3 No claim will be entertained where such stoppage does not exceed one hour in aggregate each day.

1.9 Specific Site Requirements

- .1 When work is to be done within restricted area after normal working hours, provide Departmental Representative with minimum 24 hours notice of area and times.
- .2 Contractor's vehicles will be removed from the construction site when not actually in use. If Contractor's vehicles are left at the airport, they are to be stored in a location coordinated with and directed by Departmental Representative.
- .3 Operators of the vehicles to be guided by requirements of the Transport Canada Manual of Airport Traffic Directive for the Operation of Vehicles on Airport Movement Areas, a copy of which will be supplied to the Contractor prior to construction startup.
- .4 The Contractor's employees and equipment that are authorized to enter the security area will be restricted to the designated work area unless escorted by Airside Escort.

- .5 Any Contractor employee found outside of the work site without authorization will have his security pass revoked and will no longer be allowed within the security area.

1.10 Staging/Storage/Stockpile Areas

- .1 Security of any and all materials in storage or staging areas will be the sole responsibility of the Contractor.
- .2 No construction equipment storage or material stockpiling is allowed onsite.

1.11 Deliveries

- .1 Any delivery vehicle required to encroach on aircraft movement/maneuvering areas not closed to aircraft traffic, must comply with requirements of this Section.
- .2 Contractor to provide Airside Escort for all entrance to and movements on Sandspit Airport.

1.12 Haul Routes

- .1 The costs of construction, maintenance, and dust control of all haul routes will be incidental to the Work.
- .2 The Departmental Representative will identify the haul routes on Sandspit Airport. All Contractor's vehicles must follow the haul routes.
- .3 The Contractor will be responsible to ensure all personnel are familiar with the haul routes prior to use.
- .4 Vehicles and drivers not following designated haul routes will be removed and permanently barred from the site.
- .5 Maintain haul routes in good condition at all times during construction. Provide dust control as directed by Departmental Representative.
- .6 Any mud or debris tracked onto the active aircraft operating surface by construction activities to be immediately removed so as not to present a hazard to aircraft operations. No construction machinery use is anticipated to be needed on any aircraft operating surfaces.
- .7 The use of calcium chloride for dust control is not permitted on the airport property.
- .8 The Contractor is responsible to restore all haul routes to the conditions which existed prior to construction to the satisfaction of the Departmental Representative, upon completion of the work.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-END OF SECTION-

PART 1 GENERAL

1.1 References

- .1 Government of Canada:
 - .1 Canada Labour Code – Part II
 - .2 Canada Occupational Health and Safety Regulations.
- .2 National Building Code of Canada (NBC):
 - .1 Part 8, Safety Measures at Construction and Demolition Sites.
- .3 Canadian Standards Association (CSA):
 - .1 CSA S269.1, Falsework for Construction Purposes.
 - .2 CSA S269.2, Access Scaffolding for Construction Purposes.
 - .3 CSA-S350, Code of Practice for Safety in Demolition of Structures.
- .4 Fire Protection Engineering Services, HRSDC:
 - .1 FCC No. 301, Standard for Construction Operations.
 - .2 FCC No. 302, Standard for Welding and Cutting.
- .5 American National Standards Institute (ANSI):
 - .1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
- .6 Province of British Columbia:
 - .1 Workers Compensation Act Part 3 Occupational Health and Safety.
 - .2 Occupational Health and Safety Regulation.

1.2 Workers Compensation Board Coverage

- .1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.
- .2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.3 Compliance With Regulations

- .1 PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety

Regulations.

- .2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations

1.4 Submittals

- .1 Submit Health and Safety Plan to Departmental Representative for review
- .2 Work affected by submittal shall not proceed until review is complete
- .3 Submit the following:
 - .1 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
 - .2 Emergency procedures
 - .3 Copies of reports or directions issued by federal and provincial health and safety inspectors.
 - .4 Copies of incident and accident reports within one week of incident.
- .4 The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative for review upon request.
- .5 Medical surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to Departmental Representative.
- .6 Submission of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:
 - .1 Be construed to imply approval by the Departmental Representative.
 - .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
 - .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.5 Responsibility

- .1 Assume responsibility as the Prime Contractor under this contract.
- .2 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.

1.6 General Conditions

- .1 Provide safety barricades around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.
- .2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.
 - .1 Provide appropriate means by use of barricades, fences, and warning signs as required.
 - .2 Secure any portions of the site at night time] as deemed necessary to protect site against entry to unsafe areas.

1.7 Project/Site Conditions

- .1 Work at site will involve:
 - .1 Construction with heavy equipment
 - .2 Ongoing airport operations.
 - .3 Exposure to tidal and wave conditions
 - .4 Slippery and unstable surfaces

1.8 Regulatory Requirements

- .1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.
- .2 In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.

1.9 Filing of Notice

- .1 The Contractor is to complete and submit a Notice of Project as required by provincial authorities at least two weeks prior to commencing work.
- .2 Provide the Departmental Representative with a copy of all notices.

1.10 Health and Safety Plan

- .1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.
- .2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:
 - .1 Primary requirements:
 - .1 Contractor's safety policy.
 - .2 Identification of applicable compliance obligations.
 - .3 Definition of responsibilities for project safety/organization chart for project.
 - .4 General safety rules for project.
 - .5 Job-specific safe work procedures.
 - .6 Inspection policy and procedures.
 - .7 Incident reporting and investigation policy and procedures.
 - .8 Occupational Health and Safety Committee/Representative procedures.
 - .9 Occupational Health and Safety meetings.
 - .10 Occupational Health and Safety communications and recordkeeping procedures.
 - .2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
 - .3 List hazardous materials to be brought on site as required by work.
 - .4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
 - .5 Identify personal protective equipment (PPE) to be used by workers.
 - .6 Identify personnel and alternates responsible for site safety and health.
 - .7 Identify personnel training requirements and training plan, including site orientation for new workers.
- .3 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in

the hazard assessment and are reflected in the plan.

- .4 Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.
- .5 Departmental Representative's review: the review of Health and Safety Plan by Public Works and Government Services Canada (PWGSC) shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

1.11 Emergency Procedures

- .1 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:
 - .1 Designated personnel from own company.
 - .2 Regulatory agencies applicable to work and as per legislated regulations.
 - .3 Local emergency resources.
 - .4 Departmental Representative.
- .2 Include the following provisions in the emergency procedures:
 - .1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
 - .2 Evacuate all workers safely.
 - .3 Check and confirm the safe evacuation of all workers.
 - .4 Notify the fire department or other emergency responders.
 - .5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
 - .6 Notify Departmental Representative.
- .3 Provide written rescue/evacuation procedures as required for, but not limited to:
 - .1 Work at high angles.
 - .2 Work with hazardous substances.
 - .3 Trenching works
 - .4 Work over and adjacent to water.
- .4 Design and mark emergency exit routes to provide quick and unimpeded exit.
- .5 Revise and update emergency procedures as required, and re-

submit to the Departmental Representative.

1.12 Hazardous Products

- .1 Provide with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.
- .2 Where use of hazardous and toxic products cannot be avoided:
 - .1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents.

1.13 Powder-Actuated Devices

- .1 Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.

1.14 Fire Safety and Hot Work

- .1 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.
- .2 Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.

1.15 Fire Safety Requirements

- .1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.16 Unforeseen Hazards

- .1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.

1.17 Posted Documents

- .1 Post legible versions of the following documents on site:
 - .1 Health and Safety Plan.

- .2 Emergency procedures.
 - .3 Notice of Project.
 - .4 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
 - .5 Workplace Hazardous Materials Information System (WHMIS) documents.
 - .6 Material Safety Data Sheets (MSDS).
 - .2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, protected from inclement weather, visible to all workers and in locations accessible to workers.
- 1.18 Meetings
- .1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.
- 1.19 Correction of Non-Compliance
- .1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.
 - .2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
 - .3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-END OF SECTION-

PART 1 GENERAL

1.1 Environmental Factors

- .1 Ensure that operations meet all applicable environmental regulations and standards.

1.2 Fires

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

1.3 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.

1.4 Work Adjacent to Waterways

- .1 Conduct all construction operations in marine tidal zone in accordance with requirements as set forth or agreed to by regulatory agencies.

1.5 Pollution Control

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to local authorities emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .5 Spill kits and containment are to be maintained on site and ready for deployment in case of spills.
 - .1 Spill kits are to contain sufficient quantities of absorbent material on site in close proximity to working machinery.
 - .2 During the work there are to be trained and qualified personnel on site that are ready to deploy spill kits when necessary.

1.6 Protection of Wildlife

- .1 Make every effort to minimize disturbance to the benthic and upland wildlife communities.
 - .2 Any large invertebrates adhering to the portion of the revetment
-

under construction must be removed and replaced in the nearby marine environment.

- .3 Do not disturb eel grass or kelp beds.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-END OF SECTION-

PART 1 GENERAL

1.1 Inspection

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.]

1.2 Inspection and Testing

- .1 Contractor will coordinate, provide services, and pay services for Quality Control testing as detailed in Section 01 11 55.
- .2 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with 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 defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Contractor to pay costs for retesting and reinspection of any work found to be out of compliance with the Contract Documents.

1.3 Access to Work

- .1 Allow inspection/testing agencies and Departmental
-

Representative access to Work, granular material production area, stockpile areas, off site manufacturing and fabrication plants.

- .2 Co-operate to provide reasonable facilities for such access.

1.4 Procedures

- .1 Notify appropriate agency and Departmental Representative 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.

1.5 Rejected Work

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

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-END OF SECTION-

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.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative's inspection.
 - .2 Departmental Representative's Inspection:
 - .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative, Airport Personnel and Contractor.
 - .2 When Work is incomplete according to Departmental Representative, complete outstanding items and request re-inspection.

1.2 Final Cleaning

- .1 Clean site and remove all construction materials.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-END OF SECTION-

PART 1 GENERAL

1.1 Related Sections

- .1 Section 01 77 00 – Closeout Procedures.

1.2 Action and Informational Submittals

- .1 Provide submittals in accordance with Section 01 33 00
- .2 Provide evidence, if requested, for type, source and quality of products supplied.

1.3 As-Built Documents and Samples

- .1 Maintain one record copy of:
 - .1 Contract drawings and approved submittals
 - .2 Specifications
 - .3 Addenda
 - .4 Change orders
 - .5 Other modifications to contract
 - .6 Field test records
 - .7 Laboratory test records

1.4 Recording Information on Project Record Documents

- .1 In accordance with Section 01 11 55, clause 1.11.

1.5 Materials

- .1 Filter Cloth: include product data and technical specifications.
- .2 Rock Materials: include test samples and location of source.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-END OF SECTION-

PART 1 GENERAL

1.1 Measurement Procedures

- .1 Material will be measured by Departmental Representative for payment in cubic meters as further described below.
 - .1 Excavation will be measured as difference in cubic meters between material in its original location and the design subgrade, using preconstruction survey as reference. Work to consist of:
 - .1 Excavation to design grades of existing bank materials of all type, including existing armour rock to be salvaged for reuse.
 - .2 Stockpiling of salvageable armour rock within the tidal zone for reuse.
 - .3 Placement of salvaged armour rock will be measured separately.
 - .2 Backfilling of excavated material will be measured as difference in cubic meters between excavated material and volume of salvaged riprap armour reused in the work. Work to consist of:
 - .1 Installing backfill as Type 4 backfill where required to meet design subgrade elevations.
 - .2 Grading remainder surplus backfill over revetment face.

1.2 References

- .1 American Society for Testing and Materials Internations (ASTM)
 - .2 Independent STM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .3 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D422-63 2002, Standard Test Method for Particle-Size Analysis of Soils.
 - .5 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ;) (600 kN-m/m ;).
 - .6 ASTM D1557-02e1, Standard Test Methods for
-

Laboratory Compaction Characteristics of Soil Using
Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).

.7 ASTM D4318-05, Standard Test Methods for Liquid
Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch
Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire,
Metric.

1.3 Definitions

- .1 Excavation classification: all excavation will be classified as
common excavation, regardless of material type
- .2 Fill, Type 4: excavated materials other than salvaged riprap to
be reused as backfill with surplus graded over finished revetment.
This includes only material excavated on-site.
- .3 Riprap Armour, Type 2A: riprap armour to be used in revetment
construction
- .4 Underlayer, Type 1: underlayer rock to be used in revetment
construction

1.4 Preconstruction Submittals

- .1 Submit construction equipment list for major equipment to be
used at the construction site within 5 days of contract award.

PART 2 PRODUCTS

2.1 Materials

- .1 Armour, Type 2A and Underlayer, Type 1 materials to Section
31 37 00 – Revetment Armour and Underlayer.
- .2 Fill, Type 4 materials to consist of excavated site materials other
than armour salvaged for reuse in revetment.

PART 3 EXECUTION

3.1 Temporary Erosion and Sedimentation Control

- .1 Provide temporary erosion and sedimentation control measures
to prevent soil erosion and discharge of soil-bearing water runoff
to adjacent tidal waters, according to requirements of authorities
-

having jurisdiction.

- .2 It is expected that erosion and sedimentation control measures will be satisfied by conformance to the construction sequencing as described in item 3.1.7 of Section 31 37 00 Revetment Armour and Underlayer.
- .3 Inspect, repair, and maintain erosion and sedimentation control measures during construction until revetment structure has been established.
- .4 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 Stockpiling

- .1 Stockpile salvaged riprap for reuse as revetment armour on the beach, below the toe of bank. Up to three locations along the face of revetment may be used for stockpile.
- .2 No other material may be stockpiled onsite.

3.3 Excavation

- .1 Advise Departmental Representative at least 14 days in advance of excavation operations.
- .2 Excavate to lines, grades, elevations and dimensions as indicated on the Plans, or as directed by Departmental Representative.
- .3 Notify Departmental Representative when bottom of excavation is reached.
- .4 Address unauthorized over-excavation as follows:
 - .1 Fill areas with backfill, Type 4 material at no additional cost to the owner.

3.4 Backfilling

- .1 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .2 Do not use backfill, Type 4 material which is frozen or contains ice, snow or debris.

-END OF SECTION-

PART 1 GENERAL

1.1 Related Sections

- .1 Section 31 23 33 – Excavating, Trenching and Backfilling
- .2 Section 31 37 00 – Revetment Armour and Underlayer

1.2 References

- .1 ASTM International
 - .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM D4491-99a(2009), Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .3 ASTM D4595-09, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method. ASTM D4716-08, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 - .4 ASTM D4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2-2004, Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
 - .1 No.2-M85, Methods of Testing Geosynthetics - Mass per Unit Area.
 - .2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.
 - .3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
 - .4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
 - .5 No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

1.3 Measurement Procedures

- .1 Measurement for payment of Geotextile, Type B will be the actual amount of ground surface covered, complete in place. Overlapping areas are considered incidental, and will not be measured.

1.4 Action and Informational Submittals

- .1 Provide submittals in accordance with Section 01 33 00
- .2 Product Data
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for geotextiles. Include product characteristics, performance criteria, physical size, finish and limitations as related to requirements in this section..
 - .2 All brands of geotextile to be used will be accepted on the basis of a certification by a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the cloth. The mill certificate or affidavit to attest that the geotextile meets the chemical, physical, and manufacturing requirements stated in this section.
- .3 Samples
 - .1 Submit following samples 2 weeks prior to beginning Work:
 - .1 Minimum size of 1m x 1m sample of geotextile.
 - .2 Proposed securing hardware; one item of each

1.5 Delivery, Storage and Handling

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in a clean, dry, well-ventilated area.
 - .2 Store and protect geotextiles from direct sunlight and UV rays.
 - .3 Replace defective or damaged materials with new.
 - .4 Materials to be wrapped in a heavy-duty protective covering.

PART 2 PRODUCTS

2.1 Material

- .1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.
 - .1 Width: 3 m minimum.
 - .2 Length: 15 m minimum.
 - .3 Composed of synthetic polymer composed of at least 85% by weight of propylene, ethylene, or vinylidene-chloride material with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure. The UV treated fabric shall provide a minimum of 70 percent of breaking strength retention after 500 hours of exposure when tested in accordance with ASTM D4355.
- .2 Physical properties:
 - .1 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 200 g/m².
 - .2 Tensile strength and elongation (in any principal direction): to ASTM D4632:
 - .1 Tensile strength: minimum 800 N, wet condition.
 - .2 Elongation at break: maximum 50%.
 - .3 Seam strength: equal to or greater than tensile strength of fabric.
 - .3 Grab tensile strength: to CAN/CGSB-148.1, No.7.3.
 - .1 Breaking force: minimum 800 N, wet condition.
- .3 Hydraulic properties:
 - .1 Apparent opening size (AOS): to ASTM D4751, 150 micrometres.
 - .2 Permittivity: to ASTM D4491, 1 sec⁻¹.

- .4 Securing pins and washers: to CSA G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m² to ASTM A123/A123M.

PART 3 EXECUTION

3.1 Examination

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are free of projections or depressions, and rocks, roots, and other sharp objects which may cause the filter cloth to be punctured, and acceptable for geotextile material installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied to the approval of the Departmental Representative.

3.2 Installation

- .1 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
 - .2 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
 - .3 Overlap each successive strip of geotextile a minimum of 1000 mm over previously laid strip.
 - .4 Pin successive strips of geotextile with securing pins at 600 mm interval at mid point of lap.
 - .5 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
 - .6 After installation, cover with Underlayer, Type 1 within 4 hours of placement, or prior to inundation by tide cycle, whichever is sooner.
 - .7 Back dump Underlayer, Type 1 on the ground adjacent to the geotextile, or on previously covered sections, and carefully push or spread Underlayer onto the geotextile by a dozer or other machinery in the direction of the geotextile overlap, while maintaining a proper overlap and geotextile continuity.
 - .8 Maintain a minimum depth of 300mm between the geotextile
-

and the wheels or tracks of construction equipment. Machinery is not to operate directly on the unprotected geotextile.

- .9 Replace damaged or deteriorated geotextile to approval of Departmental Representative.
- .10 Place and compact soil layers in accordance with Section 31 23 33- Excavating, Trenching and Backfilling, and 31 37 00 – Revetment Armour and Underlayer.

3.3 Cleaning

- .1 Progress Cleaning: Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.4 Protection

- .1 Vehicular traffic not permitted directly on geotextile.

-END OF SECTION-

PART 1 GENERAL

1.1 Description

- .1 The work under this Section includes providing all labour, materials, tools and equipment necessary for furnishing and installing the revetment armour rock and underlayer rock to the breakwater, as shown on the Plans, or as directed by the Departmental Representative.

1.2 Measurement Procedures

- .1 Measurement for Riprap Armour, Type 2A will be the actual volume of cubic metres supplied and installed in place to lines, grades and tolerances shown on the drawings, as surveyed by the Departmental Representative.
- .2 Measurement for Underlayer, Type 1 will be the actual volume of cubic metres supplied and installed in place to lines, grades, and tolerances shown on the drawings, as surveyed by the Departmental Representative.
- .3 Measurement for Salvaged Riprap will be the actual volume of cubic meters of salvaged riprap as measured by the Departmental Representative from the stockpile created during the excavation of existing ground.

PART 2 PRODUCTS

2.1 Materials

- .1 Hard, durable, abrasion-resistant material which will not disintegrate under wave action or wet-dry, freeze-thaw cycles; to Departmental Representative's approval.
- .2 Angular in shape with ratio of maximum to minimum dimensions not exceeding 3, free of weak cleavage planes, hairline cracks or laminations.
- .3 Soundness: The weight loss tested by 5 cycles in accordance with ASTM C88 shall not be more than 20 percent when sodium sulfate is used or more than 25 percent when magnesium sulfate is used.
- .4 Relative density (formerly specific gravity): to ASTM C127, not less than 2.55.
- .5 Absorption: to ASTM C127, maximum of 2%.
- .6 Los Angeles degradation test: to ASTM C535, with 50% maximum loss.
- .7 Stones to meet the following gradations as governed by mass:
 - .1 Riprap Armour, Type 2a
 - .1 Armour rock gradation to be in accordance with Table 2.1:

Mass (kg)	Nominal Size (mm)	Percent Total Weight Finer
2388	1111	100
2011	1049	90-100
509	661	35-55
126	416	0-25
50	307	<15

Table 2.1: Riprap Armour, Type 2A Gradation

- .2 Underlayer, Type 1:
 - .1 Underlayer, Type 1 gradation to be in accordance with Table 2.2:

Mass (kg)	Nominal Size (mm)	Percent Total Weight Finer
376	600	100
218	500	75-100
112	400	50-75
47	300	30-55
5.9	150	0-30
0.22	50	<15

Table 2.2: Underlayer, Type 1 Gradation

.3 Salvaged Riprap Armour

- .1 Armour rock from the existing revetment to be salvaged and reused in construction of the new revetment. Salvaged Riprap Armour gradations should generally meet specifications of Table 2.1. Departmental Representative to be notified if salvaged riprap armour gradations vary from the Table 2.1 specifications by more than 20%. Placement of salvaged riprap armour to be in accordance with Part 3 Execution.

PART 3 EXECUTION

3.1 Placing

- .1 Excavation of toe trenches and other necessary excavation to be completed by the Contractor and approved by the Departmental Representative before the placing of riprap armour and underlayer rock commences. Slopes to be protected to be dressed to a reasonably smooth surface, within tolerances shown on the Plans.
- .2 Unprotected embankment slopes are subject to erosion from wave action at this site. Placement of riprap armour and underlayer rock to be scheduled to provide protection against erosion at all times.
- .3 Riprap armour and underlayer rock to be uniformly placed to its full course thickness in one operation on prepared slopes and in such a manner to avoid displacing underlying material. Placement to proceed up the slope from the toe. Final placement by end dumping methods from the top of the slope will not be allowed.
- .4 Armour and underlayer rock to be placed and distributed by mechanical means to provide a uniform mass of stones. All

stones to be so placed and distributed that there are no large accumulation or area composed mainly of either the larger or smaller sizes of stones. Segregated areas consisting predominantly of smaller or larger stones to be adjusted and redistributed by mechanical means.

- .5 All stones to be placed uniformly to provide a reasonably uniform surface. Sort and manipulate stones by mechanical equipment until acceptable by Departmental Representative. Sort stones prior to placement and place flat face at finish template plane. Manipulate, consolidate and tamp shoulder and slopes as required to achieve flat, uniform planes.
- .6 Voids in the armour layer larger than the minimum size of armour gradation to be filled with smaller stones within the gradations in Table 2.1. The rock to be manipulated sufficiently by means of an excavator, rock tongs, or other suitable equipment to secure a regular surface plane and mass stability.
- .7 Armour and underlayer rock to be placed in conjunction with the construction of the revetment embankment to prevent erosion through tidal or stormwater runoff action, with only sufficient lag in construction of the armour and filter rock protection as may be necessary to prepare slope and install filter cloth.
- .8 The Contractor to provide a level compact area, at location of rock production, of sufficient size to dump and sort typical loads of riprap armour and underlayer rock material for routine inspection and approval prior to delivery to site. The Contractor to provide assistance, including mechanical equipment and weigh scale adequate to weigh individual pieces of armour material, at no additional cost to the Departmental Representative, as required to sort rocks for measurement and inspection purposes to determine if the riprap armour and underlayer rock is within Specifications.
- .9 Oversize salvaged armour rock to be placed only in toe portion of the revetment. No oversize material will be accepted in the sloped bank revetment portion.
- .10 Final acceptance of riprap armour and underlayer rock materials to be in final location following field sorting, mechanical manipulation and placement.

3.2 Finish Tolerances

- .1 All construction tolerances as shown on the Plans are to be measured perpendicular to the slope.

-END OF SECTION-