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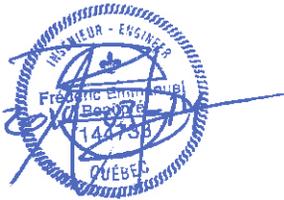
Port of Gros-Cacouna

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Repair of the Northern Breakwater

Project n° R.090104.001

**SPECIFICATIONS**



February 2019

**Port of Gros-Cacouna**

Project n°: R.090104.001

**Repair of the Northern Breakwater**

February 2019

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**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not used

**1.2                REFERENCES**

- .1            Not used

**1.3                WORK LOCATION**

- .1            The Work takes place at the location of the port of Gros-Cacouna in Montmagny-L'Islet-Kamouraska-Rivière-du-Loup County.

**1.4                WORK DESCRIPTION**

- .1            The Work covered by this contract consists of, but is not limited to, the repair of the armour stone of the northern breakwater. The areas to repair are shown on the plans. The repair of these areas requires the preparation and levelling of the existing armour stone following by the supply and installation of new amour stones.

**1.5                SITE INSPECTION**

- .1            Before submitting its bid, Contractor is responsible to visit the site and get all the necessary information regarding nature and scope of the Work, as well as all the conditions that may affect the execution of the contract.
- .2            By bidding for the present contract, Contractor confirms its knowledge of the nature and location of the Work, general and local conditions, especially weather or climatic conditions, wave action, tide levels, specific physical conditions at the contract site and any other situation that may affect the execution of the contract and the value of the Work.

**1.6                CONTRACTOR USE OF PREMISES**

- .1            Contractor has access to the worksite until completion of the Work.
- .2            The reserved area for the Contractor is indicated on the project drawings. If the Contractor uses other parcels of land, a copy of the agreement shall be sent to the Departmental Representative.
- .3            The use of the site is restricted to activities required for the execution of the Work.

**1.7                EXISTING UTILITY SERVICES**

- .1            No service is provided to the Contractor for execution of the Work. Contractor shall provide its own water, electricity, etc.

**1.8 SITE STAKING**

- .1 Fully stake out the site and ensure its complete implementation depending on the indicated location, lines and levels.
- .2 Before commencing the Work, the Contractor shall verify all measurements on the site and notify the Departmental Representative of any errors or discrepancies.

**1.9 REQUIRED DOCUMENTS**

- .1 Maintain at the worksite, one copy each document as follows:
  - .1 Drawings
  - .2 Specifications
  - .3 Addenda
  - .4 Reviewed Shop Drawings
  - .5 List of Shop Drawings
  - .6 Change Orders
  - .7 Other Modifications to the Contract
  - .8 Tests Reports
  - .9 Work Schedule
  - .10 Health and Safety Plan and other safety-related documents
  - .11 Other documents as specified

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not used

**1.2                REFERENCES**

- .1            Not used

**1.3                MEASUREMENT METHOD**

- .1            Contractor must submit, within ten (10) working days after receiving an acceptance notice for the contract, the following information:
  - .1            The cost breakdown for lump sum items.
  - .2            The list of equipment necessary for the execution of the Work and their hourly rates.
  - .3            The list of hourly rates for his staff.
- .2            The lump sum prices and unit prices include, but not limited to, all materials, transportation, leasing, and installation of equipment (machinery, tools, etc.), labour, administrative costs, profit, funding, expenditures for the Work not specifically defined either in the plan, or specifications or any other tender documents, but considered necessary so as to conform to best practices.
- .3            The method used to measure labour, equipment or materials for the contract is as follows:

**Item 1 - Site organization**

- .1            This item includes the following:
  - .1            Surety and administrative charges;
  - .2            Investigation, planning, management and supervision;
  - .3            Permits and submittals to authorities (municipal, provincial and federal);
  - .4            Management of general waste that is not included in other items;
  - .5            Connection and disconnection of temporary services (electricity, water, etc.);
  - .6            Bills for temporary public services (electricity, telephone, Internet, water, etc.);
  - .7            Temporary installations at construction sites, including fences;
  - .8            Maintenance and final cleaning of the worksite.
  - .9            Security services, signallers, guards, etc.

- .10 All components in the contractual documents for which payment was not designated in another measured item.
  - .11 All costs related to stone production, such as laboratory fees, cost for labour at the quarry, the installation and operation of the scale, etc.
  - .12 Other activities and expenses necessary to the site organization.
  - .13 Any other costs or expenses not covered elsewhere in the Drawings and Specifications and which are necessary for the completion of the Work.
- .2 This item is measured as a lump sum price.

### **Item 2 - Mobilization and demobilization**

- .1 This item includes all costs related to the transportation and handling of all equipment and construction of facilities, and other activities necessary for mobilization and demobilization and all other incidental expenses.
- .2 This item is measured as a lump sum price.

### **Item 3 – Toes formation and levelling**

- .1 This item includes the toes formation and levelling of the existing armour stones in the areas to repair in accordance with the contractual documents.
- .2 This item is paid by square metre of repaired areas, as measured on site.

### **Item 4 – New armour stones**

- .1 This item includes the supply and installation of the new armour stones in accordance with the contractual documents.
- .2 This item is paid by the metric tonne (t) of new armour stones installed.

The Bid form is subdivided to represent the quantity for each type of areas to repair:

- 4.1 New armour stones (3 à 7 t) – Slopes**
- 4.2 New armour stones (3 à 7 t) – Ridge**

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not used

**1.2                REFERENCES**

- .1            Not used

**1.3                APPOINTMENT AND PAYMENT**

- .1            Services of testing laboratory appointed by the Contractor
  - .1            Contractor shall supply and pay the expenses for laboratory testing services, particularly for the following:
    - .1            Inspection and testing required by laws, ordinances, rules, standards and requirements of contractual documents.
    - .2            Tests and certificates of compliance for the new armour stones.
    - .3            Certificates of compliance of the source(s) of stone.
    - .4            Inspection and testing of the Contractor, its suppliers or subcontractors.
    - .5            Certificates of compliance.
    - .6            Tests specified to be carried out by Contractor under supervision of Departmental Representative.
  - .2            Services of testing laboratory appointed by the Departmental Representative
    - .1            Departmental Representative can appoint testing laboratory services for its own quality insurance requirements. The Departmental Representative is responsible for the costs of inspection and testing done by the Services and testing laboratory appointed by the Departmental Representative.
    - .2            Where a test or an inspection identifies noncompliance, the Contractor must pay for the cost of testing and inspections necessary to verify compliance.

**1.4                CONTRACTOR'S RESPONSIBILITIES**

- .1            Provide labour, equipment and facilities to:
  - .1            Allow the access to the worksite for inspection and testing.
  - .2            Facilitate inspections and tests.
  - .3            Repair the Work disturbed by inspections and tests.
  - .4            Allow the testing laboratory services to store samples on the worksite.
- .2            Notify the Departmental Representative of tests and inspections 48 hours minimum in advance.
- .3            Where materials are to be tested, deliver a duplicate of the sample to the testing laboratory Services appointed by the Departmental Representative or as specified by the Departmental Representative.

**Part 2            Products**

**2.1                NOT USED**

.1                Not used

**Part 3            Execution**

**3.1                NOT USED**

.1                Not used

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not used

**1.2                REFERENCES**

- .1            Not used

**1.3                ADMINISTRATIVE MODALITIES**

- .1            Schedule project meetings throughout the work progress according to schedule or at the request of the Departmental Representative and be present.
- .2            Provide physical space and make the arrangements necessary for each project meeting.
- .3            Contractor, subcontractor and suppliers representatives that are attending the meetings must be qualified and authorized to act on the behalf of the companies they represent.
- .4            The Departmental Representative:
  - .1            Prepares the agenda for each project meeting and send it all to participants and, at least one (1) working day prior to the meeting.
  - .2            Chair all the project meetings.
  - .3            Writes down minutes of meetings. Indicate all important questions and decisions therein. Specify the actions taken by the different parties.
  - .4            Distributes the minutes of meetings to the participants and to concerned parties, within five (5) working days after the meeting.

**1.4                KICK-OFF MEETING**

- .1            Within fifteen (15) working days after receiving the acceptance notice for the contract, schedule a kick-off meeting to discuss administrative procedures and responsibilities.
- .2            Must be in attendance: the Departmental Representative and the Contractor.
- .3            Establish time and location of meeting and notify parties concerned, at least five (5) working days before the meeting.
- .4            Agenda to include:
  - .1            Appointment of official representative of all parties involved in the execution of the Work.
  - .2            Work Schedule: in accordance with Section 01 32 16.07 - Construction Progress Schedules.
  - .3            Submittals Schedule in accordance with Section 01 33 00 - Submittal Procedures.
  - .4            Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 51 00 – Temporary Utilities; 01 52 00 - Construction Facilities and 01 56 00 – Temporary Barrier and Enclosure.
  - .5            Site security in accordance with Section 01 35 29.06 – Health and Safety Requirements and Section 01 56 00 - Temporary Barriers and Enclosures.

- .6 Proposed changes, change orders, procedures, approvals, markup percentages permitted, time extensions, overtime, and other administrative requirements.
- .7 Products provided by the Owner.
- .8 Shop drawings to submit.
- .9 Acceptance procedures and warranties.
- .10 Monthly progress claims, administrative procedures, photographs, hold backs.
- .11 Appointment of testing laboratory services for inspection and testing requirements.
- .12 Site inspection and the production of a report of damages on site.

## **1.5 PROGRESS MEETINGS**

- .1 The Departmental Representative establishes, with the collaboration of the Contractor, a meetings schedule. Meetings must be held every two (2) weeks or as specified by the Departmental representative.
- .2 The meetings schedule can be modified depending on the work progress and specific needs, with the consent of the various parties.
- .3 Must be in attendance: Contractor, major Subcontractors involved and the Departmental Representative.
- .4 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of the work progress since the previous meeting.
  - .3 Shop drawings and product samples.
  - .4 Field observations, problems, conflicts.
  - .5 Problems which affect construction schedule.
  - .6 Review of off-site fabrication delivery schedules.
  - .7 Corrective measures and procedures to regain schedule.
  - .8 Revision to construction schedule.
  - .9 Progress schedule, during succeeding work period.
  - .10 Review submittal schedules: expedite as required.
  - .11 Review proposed changes affecting the construction schedule and the completion date.
  - .12 Other.

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not used

**Part 3            Execution**

**3.1                NOT USED**

.1            Not used

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not used

**1.2                REFERENCES**

- .1            Not used

**1.3                DEFINITIONS**

- .1            Activity: elements of the Work performed during the course of Project. Activity normally has expected duration, and expected costs and expected resource requirements. Activities can be subdivided into tasks.
- .2            Bar Chart (Gantt chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of the chart, dates are shown across top, and the duration of activities are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management systems.
- .3            Baseline: the original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4            Duration: amount of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .5            Master Plan: summary-level schedule that identifies major activities and key milestones.
- .6            Milestone: significant event in the project, usually completion of major deliverable.
- .7            Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed records of tasks or activities necessary to satisfy the Master Plan. Monitoring and Control Process Plan involves using Project Schedule in executing and controlling activities and is used as the basis for decision-making throughout project life cycle.
- .8            Construction Progress Schedule: overall system for the monitoring of work progress in relation to established milestones.
- .9            Critical path: this is a sequence of activities that determines the duration of the project. The critical path is usually the longest path between the beginning and end of the project.

**1.4                REQUIREMENTS**

- .1            Ensure that the Master Plan and Project Schedule are practical and remain within the specified duration and date of the milestones of the Contract.
- .2            The Master Plan shall be in accordance with prescribed milestones and time frame.
- .3            Limit duration of activity to maximum of approximately [10] working days, to be able to generate a report of the work progress.

- .4 Ensure that it is understood that the commencement of the Work, Master Plan, Interim Certificate and Final Certificate as defined milestones.
- .5 Ensure the Project Schedule is respected through Monitoring and Control Process Plan. Ensure integrity of the critical path, comparing the actual progress of individual activities describes in the Project Schedule in comparison with the baseline.
- .6 Carry out frequent checks so as to immediately detect the causes of delays and eliminate them.

## **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit a Bar Chart of the Master Plan to Departmental Representative within fifteen (15) working days of Notice of acceptance of Offer.
- .3 Submit Project Schedule to Departmental Representative within five (5) working days after the acceptance of the Master Plan.

## **1.6 PROJECT SCHEDULE**

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 All requirements regarding armour stones production
  - .2 Site mobilization
  - .3 Work progress
  - .4 Provisional delivery of the project.
  - .5 Handing over of documents (manual, annotated plans for TQC, etc.).
  - .6 Final delivery of the project.
- .3 Clearly identify the detailed implementation schedule, the critical path of the Work and ensure a strict monitoring.

## **1.7 PROJECT SCHEDULE REPORTING**

- .1 Update the Project Schedule once a week.
- .2 Provide an up-to-date copy of the Project Schedule to the Departmental Representative two (2) working days prior to each project meeting on the site or at the request of the Departmental Representative.
- .3 Once every month, with each progressive count, provide Departmental Representative with a detailed report of the work progress. This narrative document compares Project Schedule with the baseline and presents current projections, anticipated delays, the impact of these factors and possible mitigating measures.

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not used

**Part 3            Execution**

**3.1                NOT USED**

.1                Not used

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not used

**1.2                REFERENCES**

- .1            Not used

**1.3                ADMINISTRATIVE**

- .1            Within ten (10) working days after the reception of the notice of acceptance of offer, submit to Departmental Representative the submittal schedule for documents and samples. This submittals schedule of documents and samples must enable the Contractor to follow the Master Plan and the details of execution schedule. The documents and samples provided for in this schedule must comply with all the requirements of the specifications, particularly those of the plans requested (control plan, health and safety plan, etc.).
- .2            Shop drawings and technical data sheets of materials and works are also considered to be documents and samples.
- .3            Do not undertake work requiring submittal schedule of documents before the examination of all submitted documents is completed.
- .4            The characteristics indicated on documents and samples of products and works must be expressed in metric units (SI).
- .5            Where items or information are not produced or manufactured in metric units (SI) or if the characteristics are not given in metric units (SI), the Contractor must have the information converted by the manufacturer or an engineer before submit the documents and samples
- .6            Review documents and samples prior to submission to Departmental Representative. With this review, the Contractor confirms that the documents and samples comply with the requirements of the Work and of the Contract Documents. Documents and samples that are not stamped, signed, dated or specific to the contract are returned unreviewed and are considered rejected.
- .7            Notify the Departmental Representative, in writing, of any discrepancies with the requirements of the Contract Documents and provide reasons.
- .8            Ensure accuracy of measurements against any adjacent structures affected by the Work.
- .9            Examination of documents and samples by the Departmental Representative does not relieve the Contractor of its responsibility to use complete and accurate parts in a manner consistent with the requirements of the Contract Documents.
- .10            Keep on site a verified copy of each submitted document.

**1.4 PHOTOGRAPHIC DOCUMENTATION**

- .1 Project identification: the name and number of the project and date of exposure.
- .2 Number of viewpoints: four (4) or as specified by the Departmental Representative.
  - .1 Viewpoints and their location as determined by Departmental Representative.
- .3 Frequency of photographic documentation: weekly or as directed with Departmental Representative:
  - .1 Submit with the work progress report an electronic d photography in JPEG format, of high resolution or as directed by Departmental Representative.
  - .2 At the completion of any milestone or control points, and before a next phase or activities that could conceal work or as directed by Departmental Representative.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not used

**1.2                REFERENCES**

- .1            Canada Labour Code, Canada Occupational Safety and Health Regulations (SOR/86-304)
- .2            Act Respecting Occupational Health and Safety (L.R.Q., c.S-2.1).
- .3            Canada Shipping Act, 2001, Collision Regulations (C.R.C., c.1416).
- .4            Workplace Hazardous Materials Information System (WHMIS)
- .5            CAN/CSA-Z259.10-12 – Full body harnesses
- .6            CAN/CSA-Z460-13 – Control of hazardous energy: Lockout and other methods
- .7            TP 14475 E - Canadian Life Saving Appliance Standard

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1            Submit to the Departmental Representative a Site-specific Health and Safety Plan within fifteen (15) working days after receiving the notice of acceptance of offer and prior to the commencement of the Work. The Site-specific Health and Safety Plan must include:
  - .1            Commitment of the management and the workers to the health and the safety.
  - .2            Policy of the company regarding health and safety.
  - .3            Results of site-specific safety hazard assessment.
  - .4            Results of safety and health risks and hazards analysis for site activities scheduled in the work plan.
  - .5            Procedures in case of accidents/incidents.
- .2            Submit weekly to the Departmental Representative two (2) copies of the worksite Health and Safety Inspection Reports signed by the Contractor's authorized Health and Safety representative.
- .3            Submit to the Departmental Representative within 24 hours a copy of any inspection report, correction notice or any recommendation issued by Federal, Provincial and Territorial health and safety inspectors.
- .4            Submit to Departmental Representative within 24 hours an investigation report of any accident and incident.
- .5            Submit WHMIS MSDS - Material Safety Data Sheets if needed. Contractor must also keep one copy of these documents at the worksite.
- .6            Departmental Representative will review the Contractor's site-specific Health and Safety Plan within ten (10) working days after the reception. Contractor revise its Health and Safety Plan and resubmit it to the Departmental Representative within five (5) working days after the reception of the reviewed plan.

- .7 The review by the Departmental Representative of the Contractor's Health and Safety Plan should not be construed as an approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of the medical surveillance for the site personnel prior to the commencement of the Work. Submit to the Departmental Representative additional certifications for any new site personnel.
- .9 Submit to the Departmental Representative a copy of all training certificates required for the application of the prevention program, in particular (if applicable) for the following:
  - .1 First aid at the worksite and cardiopulmonary resuscitation.
  - .2 Work in confined spaces.
  - .3 Lockout-tagout procedures.
  - .4 Wearing and adjustment of personal protective equipment.
  - .5 Any other training requirement of Regulations or the Health and Safety Plan.
- .10 Engineer's plans and certificates of compliance: Contractor must submit to the Departmental representative and to the *Commission des normes, de l'équité, de la santé et de la sécurité du travail* (CNESST) a copy signed and sealed by engineer of all plans and certificates of compliance required pursuant to the Safety code for the construction industry (S-2.1, r.4) or by any other legislation or regulation or by any other clause in the specifications or in the contract. The Contractor must also submit a certificate of conformity signed by an engineer once the facility for which these plans were prepared has been completed and before a person uses the facility. A copy of these documents must be available on site at all times.
  - .1 Any modification to an equipment or to a machinery not authorized in writing by the manufacturer. A copy of these documents must be available at the worksite.
- .11 Submit to Departmental Representative an Emergency Response Plan specific to the characteristics and constraints of the Work and of its environment. The Emergency Response plan must be distributed to all concerned persons as listed in the article « 1.3 Action and Informational Submittals. » The Emergency Response plan must contain :
  - .1 The procedure of evacuation.
  - .2 Identification of the resources (police, fire brigades, ambulances, etc.).
  - .3 Identification of the on-site persons in charge.
  - .4 Identification of the first-aid workers.
  - .5 The training required for the people responsible for its application.
  - .6 And any other information which would be necessary, considering the characteristics of the site.

#### 1.4 NOTICE OF CONSTRUCTION SITE OPENING

- .1 Before commencement of the Work, submit notice of the construction site opening to the competent authorities, particularly to the CNESST, with a copy to the Departmental Representative.

- .2 The Contractor shall assume the role of being the Primary Contractor in the limits of the construction site and elsewhere where he must execute the Work within the framework of this project. The Contractor shall recognize in writing the responsibility of being the Principal Contractor of the project and identify himself as such in the notice of the construction site opening he provides to the CNESST.
- .3 A copy of the notice of construction site opening must also be prominently posted on site.
- .4 At demobilization, a notice of construction site closing shall be forwarded to the CNESST with a copy to the Departmental Representative.

#### **1.5 CERTIFICATION OF CNESST COMPLIANCE**

- .1 Certification of CNESST compliance delivered by: the certification of compliance (Attestation de conformité) is a document issued by CNESST to confirm that the Contractor is in good standing, i.e. all amounts owed with respect to a given contract have been paid. The document shall be submitted to the Departmental Representative.

#### **1.6 EVALUATION OF RISKS/DANGERS**

- .1 Contractor must proceed with the identification of the dangers relative to each of the tasks carried out on the site.
- .2 Plan and organize the Work so as to eliminate the risk of fall at the source or ensure collective protection, thereby minimizing the use of personal protective equipment. A safety belt must not be used as fall protection.

#### **1.7 HEALTH AND SAFETY MEETINGS**

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of the Work.

#### **1.8 RISK INHERENT TO THE WORKSITE**

- .1 In addition to the risks related to the tasks to be carried out, personnel responsible for the execution of the Work on the worksite will be exposed to the following risks, inherent to the area where the Work will be executed:
  - .1 Work in a quarry for the preproduction and production of stones.
  - .2 Transportation and placement of stones of large dimensions and of many tons each.
  - .3 Heavy machinery work.
  - .4 Work on a site exposed to the severe weather and environmental conditions, including those of the sea.
  - .5 Work near a body of water.

#### **1.9 GENERAL REQUIREMENTS**

- .1 Before the commencement of the Work, prepare a site-specific Health and Safety Plan based on the hazards identified according to this section. Apply this Health and Safety Plan in its totality from the start of the project until demobilization of all personnel from the construction site. The Health and Safety Plan shall take into consideration the

specific characteristics of the project and cover all the Work to be executed on the construction site.

The site-specific Health and Safety Plan must include as a minimum the following:

- .1 Company safety and health policy.
- .2 Description of the stages of the Work.
- .3 Total costs, schedule and projected workforce curves.
- .4 Flow chart of safety and health responsibilities.
- .5 Physical and material layout of the worksite.
- .6 Risk assessment for each stage of the Work, including preventive measures and the procedures for applying them.
- .7 Identification of the preventive measures relative to the specific risks inherent to the worksite.
- .8 Identification of preventive measures for health and safety of employees and / or public worksite.
- .9 Training requirements.
- .10 Procedures in case of accident/injury.
- .11 Written commitment from all parties to comply with the Health and Safety Plan;
- .12 Construction site inspection checklist based on the preventive measures.
- .13 Emergency Response plan which shall contain at least the following:
  - .1 Construction site evacuation procedures.
  - .2 Identification of resources (police, firefighters, ambulance services, etc.);
  - .3 Identification of persons in charge of the construction site.
  - .4 Identification of the first-aid attendants.
  - .5 Communication organizational chart (including the person responsible for the site and the Departmental representative).
  - .6 Training required for those responsible for applying the plan.
  - .7 Any other information needed, in the light of the construction site's characteristics.

If available, the Departmental representative will provide the evacuation procedures of the Port of Gros-Cacouna to the Contractor who shall then coordinate the Emergency Response plan with that of the site and submit it to the Departmental representative.

- .2 Departmental representative may respond in writing, where deficiencies or concerns are observed in the Health and Safety Plan and may request resubmission.
- .3 In addition to the Emergency Response plan, during the course of the Work, the Contractor shall elaborate and submit to the Departmental representative specific written procedures for any work having a high risk factor for accident (for example: demolition procedures, specific installation procedures, hoisting plan, procedures for entering a confined space, procedures for interrupting electric power, etc.) or at the request of the Departmental representative.

- .4 The Contractor shall plan and organize the Work so as to eliminate the danger at source or ensure collective protection, thereby minimizing the use of personal protective equipment.
- .5 Equipment, tools and protective gear which cannot be installed, fitted or used without compromising the health or safety of workers or the public shall be considered inadequate for the Work to be executed.
- .6 All mechanical equipment (for example, but not limited to: hoisting devices for persons or materials, excavators, concrete pumps, concrete saws) shall be inspected before delivery to the construction site. Before using any mechanical equipment, the Contractor shall obtain a certificate of compliance signed by a qualified mechanic dated less than a week prior to the arrival of each piece of equipment on the construction site; the certificate shall remain on the construction site and transmitted to the Departmental representative on demand.
- .7 Ensure all inspections for the hoisting devices for persons or materials required by the current standards are carried out and be able to provide a copy of the inspection certificates to the Departmental representative on demand.
- .8 The Departmental representative must be consulted for the location of storing gas cylinders and tanks on the construction site.

#### **1.10 RESPONSIBILITY**

- .1 The Contractor must acknowledge and assume all the tasks and obligations which customarily devolve upon a Principal Contractor under the terms of the Act Respecting Occupational Health and Safety (L.R.Q., c. S-2.1) () and the Safety code for the construction industry (S-2.1, r.4).
- .2 The Contractor must be responsible for health and safety of any person present on the construction site, of the protection of property and safety of persons adjacent to the construction site and the environment to the extent that they may be affected by conduct of the Work.
- .3 No matter the size or location of the construction site, the Contractor must clearly define the limits of the construction site by physical means and respect all specific regulation requirements applicable in this regard. The means chosen to define the limits of the construction site must be submitted to the Departmental representative.
- .4 Comply with and enforce compliance by employees with all safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

#### **1.11 COMPLIANCE REQUIREMENTS**

- .1 Comply with the Act Respecting Occupational Health and Safety (L.R.Q., c. S-2.1) and the Safety code for the construction industry (S-2.1, r. 4.) in addition to respecting all the requirements of this specification manual.

#### **1.12 UNFORESEEN HAZARDS**

- .1 When an unforeseen or a peculiar safety-related factor, hazard, or condition occur during the progress of the Work, follow procedures in place for Employee's Right to

Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

### **1.13 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, and in consultation with Departmental Representative.

### **1.14 CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

### **1.15 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.

### **1.16 FLOATING MATERIAL**

- .1 Conform to the codes and to the municipal, provincial and national regulations concerning the present works
- .2 Mark out the floating equipment by navigation lights according to the Regulation.
- .3 Maintain a maritime radio set VHF (channel 16) aboard the floating equipment.
- .4 Obtain and submit to the Department Representative a letter of conformity emitted by Transport Canada for the approval of any boat (transport, rescue, inspection, etc.) before the beginning of the works. If there is more than a year between the date of delivery of this letter and the date of realization of the present works, also submit to the Departmental Representative a confirmation in the effect that the annual report of conformity required by Transport Canada was completed for the current year.
- .5 Floating equipment and dredge installations have to be of sufficient capacity and in good working order, to allow the execution of works in a satisfactory way, according to the calendar and to the specification.
- .6 Organize activities so as to minimize the interference with the sailors and the fishermen using the harbour.
- .7 Supply and place the necessary buoys of warning to indicate the zone of the works.

### **1.17 WORKS NEAR BODIES OF WATER**

- .1 For all the works involving risks of drowning, the following requirements must be met:
  - .1 Respect article 2.10.13 of the Safety code for building work.

- .1 Wear a life jacket or a floating device allowing to maintain the head of the user outside the water and to be able to float effortlessly arms and in compliance with the standard.
- .2 Or be protected by a safety net or a protective device against falls.
- .2 Ensure that a rescue vessel is moored and present in the water is available at each place where a worker may fall in the water. However, a vessel may serve more than one workplace on the same construction site provided the distance between any of these workplaces and the vessel is less than 100 m.
- .3 Make sure that the rescue vessel is equipped with an engine powerful enough to navigate in worksite conditions.
- .4 Make sure that the rescue vessel has required characteristics to take on board the people susceptible to take part in the rescue operation.
- .5 Make sure that the rescue vessel is available any time for the workers in accordance with Emergency Response plan.
- .6 Make sure that a qualified person is available to run the emergency equipment. This person has to hold its competence certificate according to the length of the rescue vessel.
- .7 Establish and transmit to the Department Representative the emergency procedures in which we find the information mentioned below and make sure that all the workers concerned by these procedures received the necessary training(formation) and the information to apply them :
  - .1 A description of completes procedures, including staff responsibilities.
  - .2 The location of the emergency equipment.

#### **1.18 LIFTING MATERIAL**

- .1 Lifting devices shall be positioned in such a way that loads are not carried over workers, occupants or the public.
- .2 The Contractor must transmit to department representative a work procedure, signed and sealed by an engineer, including inter alia the position of the crane, a sketch of the trajectory of the transported loads, the length of the mast and a plan of lifting for the handling of loads above occupied buildings.
- .3 All mobile cranes manufactured after January 1<sup>st</sup> 1980 must be equipped with a safety device against overload.
- .4 All mobile cranes with cables manufactured must be provided with a safety device against two-blocking.
- .5 The Contractor shall provide the Department Representative with a mechanical service inspection certificate for each lifting device. Inspections must be carried out just prior to the delivery of the equipment to the work site.
- .6 For all winch installations, the Contractor shall provide the Department Representative with the installation method recommended by the manufacturer. If unavailable, the Contractor shall then provide an installation procedure signed and sealed by an engineer. The installation procedure must take into account load-bearing capacity, the amount, weight and location of counterweight and any other detail that may affect the capacity and stability of the device.

- .7 In addition to the mechanical service inspection certificate, the annual inspection certificate and the crane logbook must be aboard all crane and crane-truck cabs.
- .8 The entire lifting area shall be closed off to prevent non-authorized people from entering it.
- .9 The Contractor shall obtain all of the permits at his own expense, in the event the thoroughfare must be temporarily closed off to meet the requirement stipulated in the preceding paragraph or for any other reason pertaining to the safety of workers, occupants or the public.
- .10 The Contractor shall carefully inspect all of the slings and lifting accessories and make sure that those in poor condition are destroyed or scrapped.
- .11 Compressed-gas cylinders shall be lifted with a basket specially designed for this purpose.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not used

**1.2                REFERENCES**

- .1            Fisheries Act (R.S.C., 1985, c. F-14)
- .2            Canadian Environmental Protection Act, 1999 (S.C. 1999, c. 33)
- .3            Navigation Protection Act, R.S.C., 1985, c. N-22
- .4            Politic of Soil Protection and Rehabilitation of Contaminated Sites (MSDEFCC) and Environmental, and applicable sampling guides
- .5            Regulations for the Port of Gros-Cacouna

**1.3                DEFINITIONS**

- .1            Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .2            Environmental protection: prevention/control of pollution and, habitat and environmental disturbance during construction. The prevention of pollution and damage to environment covers the protection of the soil, water, air, biological and cultural resources; it also includes visual aesthetics, noise, solid, chemical, gas and liquid wastes, radiation energy, radioactive substances and other pollutants.
- .3            Spill: any spill into the environment of hydrocarbons or other hazardous materials, accidentally or intentionally.

**1.4                ACTION AND INFORMATIONAL SUBMITTALS**

- .1            Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2            Technical Data Sheets:
  - .1            Submit one (1) soft copy of required descriptive records, following the terms of WHMIS, in accordance with Section 01 35 29.06 - Health and Safety.
- .3            Environmental Protection Plan
  - .1            Before commencing construction activities or delivery of materials to the construction site, submit the Environmental Protection Plan to Departmental Representative.
  - .2            Environmental Protection Plan must include a comprehensive overview of known or potential environmental issues to be addressed during the Work.
  - .3            Address topics at level of detail in accordance with environmental issues and required work activities.
  - .4            Include in Environmental Protection Plan:

- .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
- .2 Descriptions of environmental protection personnel training program, including the names and qualifications of the personnel responsible for training site personnel and a description of the training program for the of the personnel responsible for the environmental protection.
- .3 Drawings of temporary work, including drawings for temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .4 Traffic Control Plans, including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Traffic Control Plans include measures to minimize the amount of material transported onto paved public roads by vehicles or by runoff.
- .5 Worksite Plan, showing proposed activity in each portion of area and identifying areas of limited use or non-use. The Worksite Plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .6 Spill Control Plan to include procedures, instructions, contact list of authorities and reports to be used in the event of unforeseen spill of regulated substance.
- .7 Solid Waste Disposal Plan (Non-Hazardous and hazardous) identifying methods and locations for solid waste disposal including clearing debris.
- .8 Air Pollution Control Plan detailing provisions to assure that dust, debris, materials, and trash, are contained on the project site.
- .9 Contaminant Prevention Plan, identifying potentially hazardous substances to be used on the job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .10 Waste Water Management Plan identifying methods and procedures for management discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .11 Sediment Erosion and Sediment Prevention Plan, outlining the means that are implemented, including work monitoring and reporting, to verify compliance with laws and federal, provincial and municipal regulations. This plan must include the following:
  - .1 Storm water Pollution Prevention Plan may replace the Erosion and Sediment Transport Plan.
  - .2 Temporary drainage and pumping.
  - .3 Dispose of water containing suspended solids or harmful substances in accordance with regulations and local authority requirements.

## **1.5 FIRES**

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

## **1.6 WORK ADJACENT TO WATERWAYS**

- .1 Construction equipment to be operated outside of water at all time.
- .2 Carry out vehicle maintenance and refuelling at a minimum distance of 30 metres from shore.
- .3 The Environmental Protection Plan must include all aspects of the Work that are required at a distance less than 30 metres from shore and a body of water.
- .4 Store fuel, or other hazardous substances, more than 30 metres away from water bodies. If temporary oil facilities are used, then storage facilities must be planned in accordance with applicable rules and regulations. Storage systems must be on impervious surfaces. A spill kit and trained staff in case of oil spills must be available on the site.
- .5 Mark and limit to a minimum the movement of machinery in the event that it should pass below the level of the Higher High Water Large Tide (HHWLT) when the area is dewatered.

## **1.7 TRANSPORTATION OF MATERIALS**

- .1 Transportation of materials on public roads to the site shall be done from Monday to Saturday unless the competent authorities decide otherwise. Transportation shall not be allowed on Sundays and public holidays.
- .2 The Contractor shall ensure the proper functioning of the trucks used. Any truck or other means of transportation emits a level of noise or other emission that does not comply with laws and regulations shall not be used to transport materials unless it is repaired or improved upon to make it acceptable.
- .3 The Contractor shall use proper signs and cooperate with the municipality, the Departmental Representative and other competent authorities, so as to minimize the impact of transportation on the lives of residents around where the trucks pass and the project site.
- .4 Use tarpaulins to cover the materials during transportation.
- .5 Regularly clean, or at the request of the Departmental Representative, public roads using a sweeper.
- .6 Restrain circulation intended to material transport on identified path.
- .7 The Contractor must follow the rules for the Port of Gros-Cacouna.

## **1.8 PRESERVING AQUATIC LIFE AT THE PROJECT SITE**

- .1 Throughout the work progress, the Contractor shall thoroughly clean all water bodies around to recover any debris from the work.
- .2 The Contractor shall optimize activities close to water bodies, be it along beaches or river banks. At no time are heavy machinery allowed into water bodies located outside the project site.
- .3 Machinery and equipment used on and under water must use biodegradable vegetable oil.

- .4 It is forbidden to dispose of waste from demolition in water.
- .5 The Contractor shall limit the work area in which the equipment and machinery will be kept at all times.
- .6 All granular materials used in this project must be clean and free from contamination. Use clean new stones for the breakwater.
- .7 No blasting shall be done on the site of the Port of Gros-Cacouna.
- .8 Place the stones directly on the seabed, or as close as possible to the seabed, rather than dropping it from the surface of the water level in order to limit encroachment and suspension of sediment.

## **1.9 POLLUTION CONTROL**

- .1 A spill kit must be kept at a distance less than 100m from the worksite of machinery and equipment and in fuelling areas. It must contain absorbing material to recover oil products on site.
- .2 If a *spill* should occur recover immediately hazardous material and contaminated soil and dispose this material according to applying regulation.
- .3 Maintain temporary erosion and pollution control features installed under this Contract.
- .4 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .5 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.
- .6 Machinery used will be in good working condition, free of any contaminant and any adjustments will be made before it is brought on site. Ensure that there are no leakages of fuel, oil or grease. The Contractor must send a mechanical inspection certificate to the Departmental Representative on the condition of equipment just before their delivery to the site.
- .7 Avoid cleaning machinery and equipment at a distance less than 30m of a body of water.
- .8 Do not leave the engines of machines and trucks running unnecessarily.
- .9 An up-to-date environmental response kit must be in every machine, including even those for subcontractors.
- .10 In the case of a spill or other environmental incident report the matter immediately to the Departmental Representative and the following authorities:
  - .1 Environnement Canada, Environmental Emergencies Centre  
1-866-283-2333
  - .2 Ministry for Sustainable Development, Environment and the Fight against Climate Change (MDDELCC)  
1-866-694-5454
  - .3 Canadian Coast Guard, Maritime Pollution

1-800-363-4735

.4 Departmental Representative

- .11 The Contractor shall make every effort to clog the source of the spills within the recommended security limits. Oil booms and/or oil absorbing mats will be used to contain spills. The mats or oil booms will be stored in a specific container at the shore and will be towed to absorb or contain spills. The mats and booms will be loaded inside sealed containers for treatment and/or appropriate disposal.
- .12 Soil contaminated by spills should be stockpiled on waterproof tarpaulins and must be covered with waterproof tarpaulins, as well. Environmental quality checks should be done for such materials before they are taken away from the site, in accordance with the rules and regulations, and MDDELCC guidelines, at the Contractor expenses.
- .13 Water contaminated by spills must be kept and checked or immediately handed over to a specialized company, in accordance with the rules and regulations, and MDDELCC guidelines.
- .14 Hazardous material used oil and other contaminated waste shall be managed according to applying rules. This includes storage on site, transport and elimination.
- .15 All relevant staff on the site will be fully trained on procedures for emergency response to spills, methods and use of equipment, as well as relevant materials.

**1.10 NONCOMPLIANCE**

- .1 Departmental Representative notifies the Contractor in writing of any observed noncompliance with federal, provincial or municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Departmental Representative will issue a stop order for the Work until satisfactory corrective action has been taken.
- .3 After the reception of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
- .4 Take action only after receipt of written approval by Departmental Representative.
- .5 No time extension is granted or equitable adjustment is allowed to the Contractor for such noncompliance and stop order.

**1.11 INVASIVE SPECIES**

- .1 For equipment that have been cleaned and were stored on land just before the commencement of work, the Contractor needs only obliged to provide, in writing to the Departmental Representative only needs to provide, in writing, a list of this equipment, their storage location and the proposed date for the presence of a part of this equipment in the water. Departmental Representative must be able to verify whether the equipment was clean and actually stored on land before work is undertaken.
- .2 The Departmental Representative as the right at any time to obtain a second opinion. Where invasive species are observed, the Contractor shall interrupt the activities and

proceed at own cost to the cleaning of the equipment concerned and follow the above-mentioned procedure.

- .3 Should the inspection report confirm the presence of invasive species, the Contractor shall replace the equipment or proceed at own cost to a thorough cleaning of the equipment. A description of the cleaning measures shall be included in a new post-cleaning inspection report, along with all the above mentioned information.
- .4 Where floating equipment is utilized, the Contractor shall demonstrate at own cost that the floating equipment is free of invasive allogenic species at time of mobilization to the work site. Just before mobilization, the Contractor shall submit a written inspection report certifying that the equipment is free of invasive species. The report shall be prepared by a qualified biologist, specialised in the identification of benthic fauna; the sampling shall be carried out by divers. The report shall include, without limitation, a list of the equipment inspected (tugboats, scows, etc.), date and place of inspection, a short description of the sampling method and identification process, a list of the samples taken, the results in table form, and a statement concerning the presence or lack of such species. Report to include photographs and bear the signature of a qualified biologist before it is submitted to the Departmental Representative with the other contract documents required, before the equipment is mobilised on the work site.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 35 31 24 – Stone Production
- .2            Section 35 31 25 – Stone Placement

**1.2                REFERENCES**

- .1            Not used

**1.3                QUALITY CONTROL PLAN**

- .1            The Contractor must submit to the Departmental Representative a Quality Control Plan to cover all the quality control requirements required by the contractual documents and best practices (quality of materials, quality of installation, quality of inspections and tests, etc.) and any other quality control requirements of the laws and regulations.

**1.4                INSPECTION**

- .1            Allow Departmental Representative access to the Work. If part of the Work is in preparation at locations other than the worksite, allow access to such work throughout the work progress.
- .2            If Contractor covers, or permits to be covered, works that has been designated for special tests, inspections or approval procedures, the Contractor must uncover such works and have inspections or tests satisfactorily completed.

**1.5                INDEPENDENT TESTING LABORATORY SERVICES**

- .1            Employment of testing laboratory Services does not affect the responsibility of the Contractor to perform the Work in accordance with Contract Documents.
- .2            Independent testing laboratory Services appointed by the Contractor
  - .1            The Contractor is responsible for the quality control required to comply with the contractual documents. The cost of the services and of the coordination of the tests are assumed by the Contractor.
- .3            Independent Testing Laboratory Services Appointed by the Departmental Representative
  - .1            Independent testing laboratory Services can be appointed by Departmental Representative for purpose of inspecting and/or testing portions of the Work. Cost of such services will be borne by Departmental Representative.
  - .2            The Contractor is responsible to provide equipment required for executing inspection and testing by appointed services.
  - .3            If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defects. Correct defects and irregularities as advised by Departmental Representative at no cost to Departmental Representative. The contractor must pay all costs for testing and inspection to confirm compliance.

**1.6 PROCEDURES**

- .1 Notify Testing Laboratory Services and the Departmental Representative in advance regarding any tests, in order that attendance arrangements can be made.
- .2 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.
- .3 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence in such a way not to cause delays in the Work.
- .4 Provide the Departmental Representative with two (2) paper copies and one (1) electronic copy of the tests and inspections reports completed by any testing laboratory services appointed by the Contractor.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used

**END OF SECTION**

**Part 1        General**

**1.1            RELATED REQUIREMENTS**

- .1        Not used

**1.2            REFERENCES**

- .1        Canadian Standards Association (CSA International)
  - .1        CAN/CSA-Z321-96, Signs and Symbols for Workplace.

**1.3            ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

**1.4            INSTALLATION AND REMOVAL**

- .1        Prepare a site plan showing the proposed location and dimensions of areas, site equipment and other installations.
- .2        Indicate use of supplemental or other staging area.
- .3        Provide construction facilities in order to execute the Work expeditiously.
- .4        Remove equipment and other installations when they are not to be used anymore.

**1.5            SITE STORAGE/LOADING**

- .1        Confine the Work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2        Do not load or permit to load any part of the Work with weight or force that will endanger the Work.

**1.6            CONSTRUCTION PARKING**

- .1        Parking must be allowed to the Departmental Representative on the worksite.
- .2        Provide and maintain adequate access road to the worksite. The worksite must be accessible by car.

**1.7            OFFICES**

- .1        Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2        Provide marked and fully stocked first-aid case in a readily available location.
- .3        Subcontractors to provide their own offices as necessary. Direct location of these offices.
- .4        Departmental Representative's Site office.
  - .1        Provide temporary office for Departmental Representative.
  - .2        Inside dimensions at least 3,6 m long x 3 m wide x 2,4 m high, with floor 0,3 m above grade, complete with a minimum of 2 units of 50% opening windows and one lockable door.

- .3 Insulate building and provide heating systems to maintain 22 degrees C inside temperature at -20 degrees C outside temperature.
- .4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.
- .5 Install electrical lighting systems to provide min 750 lx using surface mounted, shielded commercial fixtures with 10 % upward light components.
- .6 Provide private washroom facilities adjacent to office complete with a flush or chemical type toilet, lavatories and mirrors, maintain cleanness and supply of paper towels and toilet tissue.
- .7 Equip office with 1 x 2 m table, 3 chairs, including one with a pivoting backrest, 6 m of shelving 300 mm wide, one 3-drawer filing cabinet, one plan rack and one coat rack and shelf.
- .8 Maintain in clean condition.

### **1.8 SANITARY FACILITIES**

- .1 Provide sanitary facilities for workforce and Departmental Representative in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities.
- .3 Keep area and premises in sanitary condition.

### **1.9 CONSTRUCTION SIGNAGE**

- .1 General
  - .1 Maintain approved signs and notices in good condition for duration of the Work.
  - .2 With the exception of Signs and Symbols for the Occupational Environment and the project sign, no other sign can be installed on site.
- .2 Project Sign
  - .1 Provide and erect a project sign in a location designated by Departmental Representative within three (3) weeks of signing the Contract.
  - .2 The project sign must provide a sign board of 1200H x 2400W mm.
  - .3 Paint surfaces of the project sign and its framing with a minimum of one coat primer and a minimum of two coats enamel paint. Colours: white on the signboard face, black on other surfaces.
  - .4 Apply the vinyl overlay, supplied by the Departmental Representative, to the painted project sign in accordance with the installation instructions.

### **1.10 PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .2 Provide measures for protection and diversion of traffic, including provision of watch persons and flag persons, erection of barricades, placing of lights around and in front of

- equipment and the Work, and erection and maintenance of adequate warning, danger, and direction signs
- .3 Protect public users from damage to person and property.
  - .4 Contractor's traffic on roads selected for hauling material to and from the site to interfere as little as possible with public traffic.
  - .5 Verify adequacy of existing roads and allowable load limits on these roads. The Contractor is responsible for the repair of any damage to roads caused by the Work.
  - .6 Construct access and haul roads necessary.
  - .7 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
  - .8 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
  - .9 Dust control: adequate to ensure safe operations at all times.
  - .10 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.
  - .11 Lighting: to assure full and clear visibility for the full width of haul road and work areas during work operations at night.
  - .12 Provide snow removal during the Work period.
  - .13 Remove haul roads designated by Departmental Representative upon completion of the Work.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used

**END OF SECTION**

**Part 1        General**

**1.1            RELATED REQUIREMENTS**

- .1        Not used

**1.2            REFERENCES**

- .1        Not used

**1.3            INSTALLATION AND REMOVAL**

- .1        Provide temporary barriers and enclosures in order to execute the Work expeditiously.
- .2        Remove from site all barriers and enclosures after use.

**1.4            SITE FENCE**

- .1        A site fence shall be installed on the axis specified on the drawings. Other construction and site fences may be installed by the Contractor in the Contractor's reserved and in the work area.

**1.5            ACCESS TO SITE**

- .1        A barrier is located at the entrance to the access road to the northern breakwater. The Contractor must ensure that this barrier remains locked outside construction hours.
- .2        The access road authorized to the Contractor is specified on the plan. The Contractor cannot use other routes without the authorization of the Departmental Representative.

**1.6            PUBLIC TRAFFIC FLOW**

- .1        Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform the Work and protect the public.

**1.7            FIRE ROUTES**

- .1        Maintain access for use by emergency response vehicles.

**1.8            PROTECTION OF SURROUNDING PUBLIC AND PRIVATE PROPERTIES**

- .1        Before commencement of the Work, carry out a joint inspection with the Departmental Representative and the Contractor to identify and list all existing damage to public and private properties. Take photographs to serve as records.
- .2        Protect surrounding public and private properties against any damage that could occur as a result of the Work.
- .3        Pay particular attention to the protection of finished surfaces of buildings close to the worksite. Provide screens, tarpaulins and barriers needed for protection.
- .4        If necessary, take full responsibility for damages.
- .5        Identify public services, protect them and take responsibility for damages due to the lack of protection or inadequate protection.

- .6 Take full responsibility for damages to the structures due to the lack of protection or inadequate protection.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not used

**1.2                REFERENCES**

- .1            Not used

**1.3                PROJECT CLEANLINESS**

- .1            Maintain the Work in tidy condition, free from accumulation of waste products and debris, including that caused by subcontractors.
- .2            Remove waste materials from the site daily or as directed by Departmental Representative. Do not burn waste materials on site unless approved by Departmental Representative.
- .3            Clear snow and ice from access to the construction site, bank/pile snow in designated areas only and remove from the site if required.
- .4            Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5            Provide containers on the site for collection of waste materials and debris.
- .6            Eliminate waste materials outside of the construction site according to the regulations.
- .7            Store volatile waste in covered metal containers, and remove from premises at the end of each working day.

**1.4                FINAL CLEANING**

- .1            When the Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required to execute the remaining Work.
- .2            Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3            Prior to the final review remove surplus products, tools, construction machinery and equipment.
- .4            Remove waste products and debris including that caused by subcontractors.
- .5            Remove waste materials from the site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .6            Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7            Inspect finishes, fitments and equipment and ensure specified workmanship and operations.
- .8            Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

- .9 Remove dirt and other disfiguration from exterior surfaces.
- .10 Remove snow and ice from access roads.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1            Section 35 31 25 – Stone Placement

**1.2                REFERENCES**

- .1            The latest editions of the standards and publications listed below form a part of this specification to the extent referenced.
- .2            American Society for Testing and Materials (ASTM)
  - .1            ASTM C88: Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
  - .2            ASTM C127: Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
  - .3            ASTM C136: Sieve Analysis of Fine and Coarse Aggregates
  - .4            ASTM C295: Petrographic Examination of Aggregates for Concrete
  - .5            ASTM D4992: Evaluation of Rock to be used for Erosion Control
  - .6            ASTM D6928: Standard Test Method for Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
  - .7            ASTM D7012: Standard Test Method for Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures.

**1.3                MEASUREMENT AND PAYMENT**

- .1            Measure
  - .1            The Contractor must install and certify an electronic weighing scale. The weighing scale has to be of type (chap) register and has to be of a capacity to weigh the stone and the means of transportation. The dimensions (size) of the scale have to allow to receive all the wheels of the equipment used by the Contractor.
  - .2            Contractor shall provide to the Departmental Representative copies of the weight tickets of all armour stones delivered on-site on a daily basis.
  - .3            All the stones accepted as materials in the Work shall be measured for payment in the metric tons (1,000 kg) and according to the weighing tickets from the certified scale.
  - .4            Departmental Representative may request controls on any trucks. The truck is then sent to an independent scale. The costs associated with these controls are covered by the Departmental Representative.

## 1.4 SUBMITTALS

- .1 The following information shall be submitted to the Departmental Representative.
  - .1 Stone source information:

Within fifteen (15) working days of notice of acceptance of offer, the Contractor shall submit the following information for all proposed stone sources for each stone size classification:

    - .1 Name and location of the quarry;
    - .2 Areas and lifts of the quarry;
    - .3 Specific geological stratum or strata to be used;
    - .4 Laboratory tests records and results (refer to requirements in Table 1) representation of areas and lifts for this project;
    - .5 List of completed marine projects constructed using the same stone to be furnished for this project.
  - .2 Installation and certification of the weighing scale

The Contractor shall make arrangements for the installation and certification of an electronic weigh scale at the worksite before shipping the stones as indicated in 1.4.1.1. Weighing scale installation and certification are provided at Contractor's expense.

At least five (5) working days before loading, submit the details concerning the location and the type of weighing scale installed for the purpose of the project as well as a document certifying the accuracy of the scale(s) under Industry Canada.
  - .3 Scale operators

The Contractor shall provide scale operators and pay all costs involved.
  - .4 Other weighing devices

Submit the details of the equipment incorporating load cells or other devices to weigh stones individually. These devices are provided at Contractor's expense.
  - .5 Certified weight scale tickets

A copy of each weight scale tickets, including certification of exact weight, time of weighing and of delivery shall be submitted to the Departmental Representative prior to the acceptance of the material on site.

## 1.5 TERMINOLOGY

The following definitions shall pertain to these terms:

- .1 Dimensional ratio (l/d) – report between the length (l) and the thickness (d) measured on three axes mutually perpendicular. The length of the stone (l) is the longest distance between two points on the stone (between two opposite corners). The thickness of the stone (d) is the minimal dimension of two opposite faces of the stone.
- .2 The word “ton” (t) refers to the metric ton (1 t = 1 000 kg).

## **1.6 QUALITY CONTROL STAFFING**

- .1 Retain the services of a geologist and testing laboratory services designated by the Contractor. The geologist must be a licensed professional geologist with experience in the inspection and evaluation of shell stone. The geologist must participate in the selection of the stone source, including for visual and petrographic examinations (see Table 1), identification the sectors and layers in the carry, and selection of pre-production stones. The geologist must also control the production of stones. The geologist must visually inspect the production stones to verify that they meet the quality requirements of this section.
- .2 Perform dimensional checks of production stones to verify that they meet the requirements of this section.
- .3 Verify the estimated weight against the measured weight using a weight measurement system approved by the Departmental Representative.
- .4 Mark by an "X", on three mutually perpendicular sides, all stones that do not comply with the requirements. Ensure that these rejected stones are placed in a clearly identified rejection stack or are removed from the site once marked.
- .5 Ensure that gauges and other weighing devices are calibrated and checked to maintain certification.
- .6 Submit to the Departmental Representative a production conformity report, signed by the Geologist, before the stone can be delivered to the site.

## **1.7 QUALITY ASSURANCE**

- .1 Quality Assurance activities can be performed by the Departmental Representative. These activities are intended to provide independent observations of conformance to the requirements of this Section prior to shipment of the stones to the site, and in no way relieve the Contractor of his responsibilities for Quality Control and in-place requirements.
- .2 The Departmental Representative reserves the right to undertake independent investigations and evaluations as necessary to verify whether or not materials meeting the requirements of these specifications can be produced from the proposed source(s), including the stone quality tests listed in Table 1. Any additional testing shall be undertaken on stone samples selected by the Departmental Representative. All costs associated with independent investigations and evaluations of the originally proposed stone source(s) shall be the responsibility of the Departmental Representative.
- .3 Preproduction of stones
  - .1 The Departmental Representative will verify the compliance of the Contractor's proposed stone source(s) based on the following information:
    - .1 Review of the Contractor's Stone Source Information;
    - .2 Visual inspection of stones;
    - .3 Assessment of this information relative to the specified requirements for stone quality and stone gradations and shape;
    - .4 Review of results of additional laboratory testing.
  - .2 The Departmental Representative will verify the compliance of the Contractor's proposed stone source(s) within ten (10) working days of the date of

Departmental Representative inspection or receipt of additional laboratory test results.

- .3 If the stone source(s) is rejected, the Contractor is responsible for finding a new source(s), and undertaking additional sampling and testing as required for source approval by the Departmental Representative. The Contractor is responsible for all costs associated with changing stone sources. In addition, no extension in the required completion date for this Contract is allowed because of changing stone sources.
  - .4 The Contractor must use an accepted stone source for the production of stones.
- .4 Production of stones
- .1 The Contractor shall provide equipment and operations to turn and handle disputable stone that should be revaluated by the Departmental Representative.
  - .2 Drop tests can be performed when the Departmental Representative questions the quality or integrity of specific armour stones. Drop tests shall be undertaken as follows:
    - .1 Visually inspect all sides of the stone, and mark/record existing cracks;
    - .2 Lift and drop stone from a height of 3 m onto a rigid surface (bedrock, or similarly sized stone);
    - .3 Visually inspect all sides of the stones for cracks for the opening of existing cracks and/or the development of new cracks;

Repeat points 1 to 3 a total of three (3) times as directed by Departmental Representative. The use of the Stone is acceptable if there is no opening of existing cracks and no development of new cracks.

## **Part 2 Products**

### **2.1 STONE SOURCES**

- .1 The Contractor shall be solely responsible that the selected source(s) of stones can meet the delivery schedule and produce the quality and quantity of stones required for the Work.
- .2 If the Contractor is unable to obtain a sufficient quantity of acceptable stone, the Contractor may request approval to use an alternative source(s). The Contractor is responsible for all costs associated with changing stone sources, including additional sampling, and testing as required for source approval. In addition, no extension in the required completion date for this Contract is allowed.

### **2.2 STONE QUALITY REQUIREMENTS**

- .1 Visual inspection of stones
  - .1 The stone shall be durable, sound and free from detrimental cracks, seams and other defects, which tend to increase deterioration from natural causes or cause breakage during handling and/or placing. Argillaceous stone or stone with high shale content is more susceptible to weathering, abrasion, thin bedding, close fracturing and other undesirable rock properties and shall not be accepted.

Inclusions of dirt, sand, clay, shale, chert, micaceous minerals, pegmatite, oil and oil-stained stones and rock fines or any organic or other deleterious material is not permitted.

- .2 The use of shale or slate and round stones is not accepted in any part of the project.

### **2.3 TESTS**

- .1 Inform the Departmental Representative of the proposed source for rocks and stones, and ensure access to that source for sampling, at least four (4) weeks before the start of the stone production.
- .2 Provide access to Departmental Representative to the Contractor's samples and to the quarry, for testing and inspections at least two (2) weeks prior to the start of the stone production.
- .3 The quality of the stone must meet the requirements of Table 1.
- .4 At all times, the stone samples for testing is collected in the presence of the representative of the laboratory or the Departmental Representative. The Departmental Representative could request for other tests during the project. The cost for laboratory tests shall be paid by the Departmental Representative unless the tests show some irregularities of materials, in which case the Contractor shall bear the costs.

### **2.4 SHAPE TOLERANCE OF THE STONES**

- .1 The stone must be the product of a quarry and be angular and irregular in shape.
- .2 All stones with a dimensional ratio greater than 3 is rejected.
- .3 There should not be more than 10% of stones, in number, having a dimensional ratio greater than 2,5.
- .4 The stones must spread over the entire weight range and a minimum of fifty percent (50%) of the stones, in number, must be larger than the average weight of the weight range.
- .5 Any broken stone shall be revaluated based on previous criteria.

### **2.5 WEIGHT TOLERANCE OF THE STONES**

- .1 Any stone whose weight is inferior to 0,75 of the minimum weight or superior to 1,25 of the maximum weight is rejected.
- .2 For each class of stones, at least 90% of the stones shall weight within the limits.
- .3 For each class of stones, fewer than 5% of stones shall weigh less than the lower limit.
- .4 A stone broken shall be revaluated based on previous criteria.

*Table 1 - Quality tests required for stone - Delivery methods and criteria*

Name of test	Testing method	Delivery criteria
		Class 'A' stone
<b>On-site assessment / Visual observation / Evaluation</b>		
On-site assessment <sup>1</sup>	ASTM D4992-07	No conglomerate No deleterious materials; excellent quality for earmarked usage
Petrographic review <sup>2</sup>	ASTM C295-03	No deleterious materials; excellent quality for earmarked usage
Resistance to alteration	Visual	IA – fresh unaltered stone IB – slightly altered stone (marks on the main boundary surfaces)
<b>Laboratory tests</b>		
Density, SSD	ASTM C127-07	2,65 to 2,85 >2,75 for sandstone from the site
Water absorption <sup>3</sup>	ASTM C127-07	≤ 0.5%
Compression Strength <sup>4</sup>	ASTM D7012-07	≥ 100 MPa
Micro-Deval wear resistance <sup>5</sup>	ASTM D6928-06	≤ 15
MgSO integrity <sup>4</sup>	ASTM C88-05	≤ 1.5% loss after 5 cycles
Petrographic review <sup>2</sup>	ASTM C295-03	No deleterious materials; excellent quality for earmarked usage Maximum Petrographic number: 130

**Notes**

- 1 The on-site assessment must include a report which summarizes the characteristics of the quarry and propose a development plan for it in accordance with ASTM D4992-07 standards: general lithology; geological unit and age; homogeneity of the source; stratigraphic faces; metamorphic and alteration phases; angle of stratification, direction and thickness of the stratification; proposed blasting procedures and scheduled duration of curing.
- 2 Petrographic review must be repeated before and after MgSO<sub>4</sub> integrity tests. It should be summarized in a written report, with the geological name of the stone, state of alteration, main constituents, texture, anisotropy and porosity. In addition, the report must indicate the presence of constituents, the presence of micro-fractures and / or induced stress signs (and, therefore, any possible stress release - see Section 3.2) that can be a source of problems for the proposed use and discussions thereof.
- 3 The water absorption test should be repeated on five (5) different pieces of stone.
- 4 The compression strength test should be repeated on three (3) different pieces of stone.
- 5 The micro-Deval wear resistance test should be repeated on two (2) different pieces of stone.

**Part 3 EXECUTION**

**3.1 Not used**

.1 Not Used

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 35 31 24 – Stone Production

**1.2                REFERENCES**

- .1            Not used

**1.3                SUBMITTALS**

- .1            Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2            The following information shall be submitted to the Departmental Representative.
  - .1            Construction Equipment and Procedures: At least ten (10) working days prior to commencement of the Work, the Contractor shall submit his construction procedures which must include:
    - .1            A list of all equipment and machinery to be used;
    - .2            Detailed of stone placement methods for each category and the placement sequencing;
    - .3            Demonstration that the equipment and machinery enable the realizations of the Work in accordance to the contractual documents.
  - .2            Inspection Techniques and Surveying Methods: At least ten (10) working days before undertaking the placement of stones in the structure, the Contractor shall provide the Departmental Representative with the following information for review:
    - .1            Inspection techniques and evaluation criteria applied to the placement of the stones in the structures.
    - .2            Details of survey methods implemented to ensure accurate placement, including alignment, levelling and the control of transverse sections during construction.
    - .3            After a review by the Departmental Representative, this submittal shall be included in the detailed quality control plan.
  - .3            Repair Preparation Reports: The Contractor must submit repair Repair Preparation Reports. These reports must present the measurement record of the prepared area as a function of labour time. These reports must follow the daily rate of preparation of the areas to be repaired.
  - .4            Stone Placement Reports: The Contractor must submit Stone Placement Reports. These reports must provide an estimated tonnage of new amour stones put in place, the area repaired and the time required for its placement. These reports must provide a counter-verification of the estimated tonnage in relation to the stone stock at the site, as well as the daily rates in tons of new armour stone per square metre, in tons of new armour per labour hour, and in square metre new armour stone per labour hour.

**Part 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not used

**Part 3 EXECUTION**

**3.1 QUALITY CONTROL OF STONE PLACEMENT**

- .1 General
- .1 The Contractor is responsible for Quality Control and shall establish and maintain a Quality Control Plan.
  - .2 The Contractor shall keep records of all quality control tests, surveys, inspections, including corrective measures implemented and provide copies to the Departmental Representative.
- .2 Survey Control
- .1 The Contractor shall provide range poles, marker buoys, templates, batter boards and/or any other means of guidance and control required to place the successive stone layers within construction tolerance.
  - .2 The Contractor shall provide and maintain chaining markers at fifteen (15) metre intervals along the work area. Chaining markers shall be visible in both directions along the chaining.
  - .3 Supply, install and maintain a tide rule on site. Install the instrument to allow direct reading of water level with reference to tidal datum. The type of instrument and its location shall be approved by the Departmental Representative. Submit to the Departmental Representative the Shop drawings of the tidal rule at the site at least ten (10) working days before the commencement of the Work. The tidal rule at the site must be functional before commencement of the Work.
- .3 Verification Surveys
- .1 The Contractor shall carry out verification surveys throughout the work progress to ensure that the lines, elevations and thickness are within specified tolerances.
  - .2 Equipment
    - .1 Carry out verification surveys using a DGPS, a total station survey instrument and range pole-mounted prism, a surveyor level, range pole and surveyor tape; tagline and sounding basket; or other methods in accordance with this section and subject to Departmental Representative's approval. If range poles or soundings poles are used, these devices shall be fitted with a flat, durable 30 cm diameter base.
    - .2 Carry out depth measurement by physical contact with the stone using, for example, sounding poles or leadlines. Sonic and electronic measurement are not authorized for depth measurement. Accuracy shall be better than 6 cm.

- .3 Other measurement methods, using sonic or electronic methods may be considered subject to approval by the Departmental Representative. The Contractor shall submit evidence of the accuracy of any other method and submit detailed comparison with measurement done by physical contact for all courses of stone.
- .4 The Contractor shall provide all boats, personnel all the equipment required to carry out verification surveys safely.
- .3 Execution
  - .1 Above water surveys shall be undertaken using conventional land survey methods. For underwater surveys, the Contractor shall move by boat or platform as needed, to each required reading location to cover the whole structure, including the tidal zone.
  - .2 Verification surveys shall be conducted using the survey control line (LC) and chart datum (CD).
  - .3 Verification surveys shall be carried out in the presence of the Departmental Representative unless the latter declines to attend.
  - .4 For each verification survey carried out, the Contractor shall provide the Departmental Representative with a record of verification surveys displaying the following information:
    - .1 Location of the verification survey (station along the control line);
    - .2 Categories of stone surveyed;
    - .3 Date and time of the survey;
    - .4 Weather conditions;
    - .5 Theoretical tide level
    - .6 Tide gauge reading;
    - .7 Name of participants;
    - .8 Field notes;
    - .9 Plot on cross-section paper showing the control line, neat lines and individual elevation readings;
    - .10 Numerical file of the survey.
  - .5 The exact format of the verification survey record shall be agreed upon by the Departmental Representative and the Contractor.
  - .6 The verification surveys of the underlying material (i.e., the existing structure, or the previously placed course of stone) carried out by the contractor involved shall be verified by the Departmental Representative before the next course of stone is placed.

### 3.2 STONE PLACEMENT

- .1 Generalities
  - .1 Exact locations of the areas to repair are determined on site with the Departmental Representative.
  - .2 The equipment shall allow to move the stones and rework their position if need be. The equipment used to place the stones shall be capable of moving existing stones and placing new armour stones.
  - .3 The equipment used to place the stones shall be capable of placing stones without dropping them from more than 0.3 m above final position.
  - .4 Placement using any method likely to cause segregation in a given category of stone is not authorized.
  - .5 The Contractor shall control stone placement in such way as to minimize water turbidity.
  - .6 Placement shall begin at the toe of the slope and proceed upward. Casting of stone or moving by drifting or manipulating down the slope is not permitted. Final slopes and elevation are to be achieved as stones are placed.
  - .7 Place stones carefully and avoid damaging adjacent structures. In case of damage, all repairs and/or replacement costs resulting from a lack of precaution shall be at Contractor's expense.
  - .8 The approval of stone placement and/or of verification surveys is not a final acceptance. Stone work should be considered final when the Departmental Representative has approved the placement and verified the surveys of all layers.
- .2 Tolerances
  - .1 Allowable tolerances from the lines and levels indicated in the drawings:
    - .1 Levelling of existing armour stones: [500] mm plus or minus
    - .2 Placement of new armour stones: [300] mm plus or minus.
- .3 Toes Formation and Levelling of Existing Armour Stones
  - .1 Toes formation in slopes
    - .1 The formation of toes in the slopes in the areas to repair must use the existing armour stones in order to provide support for the new armour stones to be placed.
    - .2 The exact contour of the areas to repair will be determined on site with the Departmental Representative.
  - .2 Levelling of existing amour stones
    - .1 The existing armour stones must be level uniformly in respect to the specified tolerance for each individual area to repair.
    - .2 The levelling of the areas to repair must permit the placement of a single layer of new armour stones with the slope specified on the drawings and comply with the tolerance specified.

.4 New Armour Stones

- .1 Stones shall be placed individually as indicated sloped and drawings within the tolerances described in this section.
- .2 Place the stones and ensure that they rest firmly onto the stones below and are in steady contact with surrounding stones; to archive adequate lodging, it may be necessary to change the arrangement of existing adjacent stones.
- .3 Stones must be placed without regular patterns and randomly oriented in such way that joints with adjacent stones are not aligned.
- .4 The stones with dimensional ratios between 2,5 and 3,0 shall not be laid flat on the slope or placed under water.
- .5 The stones must be placed in such a way that their longest axis is perpendicular to the reference line of the stones, i.e. in the direction of the slopes.
- .6 Perform outer slope finish as the layer of armour stone is placed. The finished slope shall be even and without any voids that can pass the smaller stones underlying filter.

**3.3 CIRCULATION ON THE BREAKWATER**

- .1 Construction of a temporary haul road on the ridge of the breakwater can be considered if there is no contamination of the breakwater structure with noncompliant materials.

**3.4 DEBRIS**

- .1 Unless otherwise indicated by the Departmental Representative, all the timbers, the unsatisfactory materials and the debris within the construction zone shall be removed and become the Contractor's property. All the materials shall be disposed.

**END OF SECTION**