

**DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE
Province of Prince Edward Island**

**TENDER FORM AND AGREEMENT
Revision 0**

THIS AGREEMENT made by and between, herein called the Contractor, the Party of the First Part and The Government of Prince Edward Island as represented by the Minister of the Department of Transportation and Infrastructure, herein called the Minister, the Party of the Second Part.

WITNESS, AS FOLLOWS:

1. Definitions

The definition of terms used in this Tender Form and Agreement shall conform in all respects to the definition of terms contained in the document entitled "General Provisions and Contract Specifications for Highway Construction", published by the Department of Transportation and Infrastructure of the Province of Prince Edward Island as amended on the date of closing of Tenders pursuant to this Agreement.

2. General Covenant

The Contractor hereby covenants and agrees with the Minister as herein provided in connection with the following work, namely:

Cedar Dunes Shoreline Restoration – West Point 2023-2024

The project is located in the Cedar Dunes Provincial Park near the West Point Lighthouse.

The work includes: Constructing two inter-tidal reefs and temporary access paths with imported armour stone, placing and spreading clean beach sand fill, and all other work necessary to complete the Contract.

TENDER CLOSES:

2:00 p.m., December 6th, 2023

Queens County Highway Depot, 355 Brackley Point Road, Charlottetown PE.

3. No Implied Contract

It is hereby understood and agreed between the parties hereto that no implied Contract of any kind whatsoever, by, or on behalf, of the Minister shall arise or be implied from anything contained in this Contract, or from any position or situation of the parties at any time, and that this Contract made by the Minister is, and shall be, the only Contract upon which any rights against the Minister are to be founded.

4. How Party of the First Part is Read

Whenever this Contract is entered into by more than one party or parties of the first part, the word "Contractor" shall be read "Contractors," and pronouns in the Contract referring to the Contractors shall be read as plural and whenever a corporation is the Party of the First Part, the said pronouns shall be read accordingly.

5. Consideration of Clauses as Covenants

Wherever it is stipulated that anything shall be done or performed by either of the Parties hereto, it shall have the same effect and be constructed as if such Party had entered into a covenant with the other Party to do or perform the same, and as if such covenant had been expressly made on the part of the Contractor, not only on the Contractor's own behalf, but also on the behalf of the Contractor's legal representative, successors or assigns; and as if any such covenant on the part of the Minister has been made on behalf of the Minister, and the Minister's successors in office.

6. Contractors Submission Respecting the Agreement

The Contractor shall, as part of the Contractor's submission respecting this Contract, complete the attached Schedule B, Identification of Principles; Schedule C, Schedule of Tendered Unit Prices; Schedule D, Schedule of Equipment to be used on the work; and Schedule E, Schedule of Sub-Contractors.

The Contract including all appended schedules shall be completed in complete conformity with the instructions to bidders contained in the document entitled "General Provisions and Contract Specification for Highway Construction".

In presenting the Contractor's submission for consideration by the Minister, the Contractor understands that until, and unless, the Contract is endorsed by the Minister, no Contract between the parties shall exist and the Minister shall not be bound to endorse any Contract.

7. Performance by Contractor

The Contractor, at the Contractor's own expense, shall, except as herein otherwise specifically provided, furnish and provide all and every kind of labour and superintendence, services, tools, implements, machinery, plant materials, articles and whatsoever is necessary for the due execution of the work. The Contractor shall fully construct and erect the work in the most thorough, professional and substantial manner, in every respect to the satisfaction and approval of the Engineer. The Contractor shall complete the work within the time specified herein and deliver it to the Minister in the manner and upon the terms and conditions of the Contract.

8. Bid and Performance Security

The Contractor hereby and herewith deposits with and delivers to the Minister, as security of the due fulfilment of the Contract, one of the following, which shall remain in effect for a minimum of 30 days after tender closing:

- a) a certified cheque in the amount stipulated in Schedule A - Schedule of Special Provisions

OR

- b) a bank draft in the amount stipulated in Schedule A - Schedule of Special Provisions

OR

- c) a bid format irrevocable standby letter of credit on a government approved form in the amount stipulated in Schedule A - Schedule of Special Provisions

OR

- d) a bid bond in the amount stipulated in Schedule A - Schedule of Special Provisions excluding HST. The bond shall be from a surety company authorized to carry on business in Canada guaranteeing to supply a performance bond equal to 50% of the Contract value, excluding HST and a labour and material bond equal to 25% of the Contract value

Performance security must be filed with the Department before work on the project commences. This security shall be held and retained by the Minister for the due and faithful performance, observance and fulfilment by the Contractor of all the covenants, provisos, agreements, conditions and reservations in this Contract contained on the part of the Contractors to be observed, performed and complied with shall be in the form of:

- e) a certified cheque in the minimum amount of ten percent (10%) of the Contract value, excluding HST, which shall be retained until the warranty period (one (1) year after substantial completion) has elapsed.

OR

- f) a bank draft in the minimum amount of ten percent (10%) of the Contract value, excluding HST, which shall be retained until the warranty period (one (1) year substantial completion) has elapsed.

OR

- g) a performance format irrevocable standby letter of credit on a government approved form in the minimum amount of ten percent (10%) of the Contract value, excluding HST, which shall be retained until the warranty period (one (1) year after substantial completion) has elapsed.

OR

8. Bid and Performance Security (continued)

- h) a performance bond equal to 50% of the Contract value, excluding HST and a labour and materials bond equal to 25% of the Contract value, excluding HST both of which shall be retained until the warranty period (one (1) year after substantial completion) has elapsed.

All performance security which has an expiry date which precedes the end of warranty date must be renewed prior to the time that the security would expire. The bidder will forfeit security to the Minister if the bidder fails to enter into or carry out the Contract when called upon to do so.

It is understood and agreed that the Contractor assumes risk and must bear any loss in respect to the performance security as aforesaid, occasioned by the failure or insolvency of the banks on which any cheque was drawn or in which any deposit was made in connection with the security aforesaid.

If at any time hereafter the said Contractor should make default under the said Contract, or if the Minister acting under the powers reserved in the said Contract shall determine that the said works, or any portion thereof remaining to be done, should be taken out of the hands of the Contractor and be completed in any manner or way whatsoever than by the Contractor, or if the Contractor refuses or neglects to pay for work done or materials supplied by any person in connection with the said work, the Minister may, in either case dispose of said security for the carrying out of the construction and completion of the work of the Contract or for paying any salaries or wages for work done, or any accounts for materials supplied for the said works that may be left unpaid by the said Contractor.

In the event of any breach, default or non-performance being made or suffered by the Contractor in or in respect of any of the terms and conditions, covenants, provisions, agreements, or restrictions herein contained, which on the part of the said Contractor should be observed, performed or complied with, the said security so delivered to or deposited with the Minister or by the Minister received in respect thereof, shall by the Contractor, be forfeited absolutely to the Minister.

Upon the due and faithful performance, observance and fulfilment by the Contractor of all the terms, provisions, covenants, agreements, conditions, reservations, hereinbefore contained, on the part of the Contractor to be observed, performed and complied with, the Minister shall surrender the performance security.

9. Minister Covenants to Pay

In consideration of the faithful performance by the Contractor of all and singular covenants, agreements and provisions of the Contract, the Minister hereby covenants and agrees with the Contractor that, on the full completion by the Contractor of all the work as specified in the Contract, within the time specified and limited for the final completion thereof, and to the entire satisfaction of the Engineer to be evidenced by the certificate of the Engineer in writing, the said Minister will well and truly pay, or cause to be paid, to the said Contractor the amount of the Contract price, representing the actual quantities in the several items in the Schedule of Prices, identified as Schedule C to this Contract, at the unit prices or lump sum prices quoted by the Contractor. This amount paid to the Contractor as above, shall include all and every kind of work,

labour, superintendence, services, tools, implements, machinery, plant materials, articles and things whatsoever necessary for the full execution and completion of the work to the entire satisfaction of the Engineer.

10. Final Payment

It is hereby agreed by the parties hereto that the payment of the final amount due under the Contract, and the adjustment and payment of any bills that may be rendered for work done, in accordance with any alteration in or addition to the same, shall release the Minister from any and all claims or liability on account of work performed under the said Contract or any alteration in or addition to the same.

11. No Waiver

It is hereby agreed that no condoning, excusing, or overlooking by the Minister, or any person acting on the Minister's behalf on previous occasions of breaches or defaults similar to that for which any action is taken or power is exercised, or forfeiture is claimed or enforced against the Contractor, shall be taken as a waiver of any provisions of the Contract, or as defeating, affecting or prejudicing in any way the right of the Minister under the Contract.

12. Components of the Contract

Any and all plans or drawings prepared by the Department, the document titled "General Provisions and Contract Specifications for Highway Construction", the advertisement, the Tender Form and Agreement together with Schedule A, Schedule of Special Provisions; Schedule B, Identification of Principals; Schedule C, Schedule of Tendered Unit Prices; Schedule D, Schedule of Equipment; and Schedule E, Schedule of Sub-Contractors, as well as any addenda which may be issued by the Department pursuant to this Contract shall hereby be a part of this Contract as fully and to the same effect as if the same had been set forth at length in the body of the Contract.

13. Completion of Work

The Contractor agrees to complete the work on, or before **March 15, 2024**.

14. FOIPP Clause

1. By submitting your bid, you agree to disclosure of the information supplied, subject to the provisions of the Freedom of Information and Protection of Privacy Act (FOIPP).
2. Anything submitted in your bid that you consider to be "confidential information" because of its proprietary nature should be marked as "confidential" and will be subject to appropriate consideration under the Freedom of Information and Protection of Privacy Act.
3. During the delivery and installation of goods and/or services, you may have access to confidential or personal information. Should this occur, you must ensure that such information is not released to any third party or unauthorized individual.
4. Any information provided on this Contract may be subject to release under the Freedom of Information and Protection of Privacy Act. You will be consulted prior to the release of any information.

IN WITNESS WHEREOF the parties hereto have hereby caused these presents to be signed and sealed on the dates stated.

SIGNED, SEALED AND DELIVERED
by the Contractor on the [] day
of [], 20[].

CONTRACTOR

.....
(Authorized Signing Officer)

In the presence of:

.....
(Witness Signature)

SIGNED, SEALED AND DELIVERED
by the Minister on the [] day
of [], 20[].

MINISTER

.....

In the presence of:

.....
(Witness Signature)

SCHEDULE A
SCHEDULE OF SPECIAL PROVISIONS

1) INSTRUCTIONS TO BIDDERS

The stipulated bid security amount shall be **\$100,000**. Upon award, the successful Contractor shall replace the Bid Security with the Performance Security.

An optional (online) Teams meeting with interested bidders, department staff, and the design consultant will be held on Wednesday, November 29th at 2:00pm to review the project design, specifications, and address questions bidders may have about the project. Should a bidder wish to attend, please email Sheri McCarthy at slmccarthy@gov.pe.ca or call (902) 370-6993 by the end of the day on Monday, November 27th. We will share an online meeting link with the bidder at that time.

A mandatory preconstruction meeting between the successful Contractor and the Department shall be held at the Queen's County Highway Depot in advance of construction start up.

The contractor shall provide surveying services for the construction of the project. This includes all necessary surveying to construct the reefs to the lines, shapes and grades as per the design.

Any excavation required to complete this contract shall be considered incidental to the work, no additional compensation shall be provided. This shall include, but not be limited to, preparing the existing seabed for embedding of armour stone, constructing temporary access paths, etc. All excavated material shall be placed on lee side of new reef as clean beach sand fill and shall be incidental to the work, no additional compensation for spreading of excavated material shall be provided.

2) SECTION 102.13 - SCHEDULING OF THE WORK

The number of working days stipulated for this Contract is **30**. These working days shall be consecutive. Liquidated damages will be assessed beyond the approved schedule. Work shall not be conducted **on** or **between** the dates of **December 22, 2023** and **January 2, 2024**. Work may resume on **January 3, 2024**.

Work shall not begin until the Federal Department of Fisheries and Oceans have granted a permit.

3) WORK METHOD

The means of access to the site shall be determined by the Department and shall adhere to all conditions of the Environmental permit. The property parcel that the Reefs are accessed from is designated and protected under the Province's Natural Areas Protection Act (NAPA). The Contractor shall adhere to specific conditions including locations designated for staging and stockpiling, as well as specific locations to access the shore (see below).

Any damage to roads, parking areas, grounds, slips, and infrastructure as a result of this work shall be repaired to preconstruction conditions by the Contractor at their own cost. This would include, but not limited to paving, landscaping, topsoil, and seed.

No additional compensation shall be provided to the Contractor due to tidal or weather conditions.



4) **SECTION 206 – BORROW FROM PIT
(Item 20614 –Sand Fill)**

Specifications for this item shall be found in **Schedule F – Schedule of Supplementary Specifications**. This item shall be paid for at the unit bid price per tonne and this price shall be full compensation for all work, material, tools, equipment, labour and incidentals necessary to perform the work. This item shall be for placing sand fill on leeward side of reefs as per Plan on sheet C02 and north of lighthouse as per Proposed Plan and Section C - Lighthouse Sea Wall on Sheet C04

5) **SECTION 213 – RANDOM RIP RAP**

(Item 21330 – Bedding Stone)

(Item 21333 – Armour Stone (1.5-3.5 Tonnes))

Specifications for these items shall be found in **Schedule F – Schedule of Supplementary Specifications**. These items shall be for the supply, loading, transporting, and placement of rip rap for the reefs as per the design drawings.

NEW REEF 6

Reef 6 shall be constructed of approximately 1,820 tonnes of imported armour stone (1.5-3.5 tonnes) and approximately 190 tonnes of Bedding Stone, and 2,720 tonnes of Beach Fill (imported sand).

NEW REEF 7

Reef 7 shall be constructed of approximately 1,980 tonnes of imported armour stone (1.5-3.5 tonnes) and approximately 190 tonnes of Bedding Layer and 3,010 tonnes of Beach Fill (imported sand).

EXISTING REEF 3

Reef 3 shall be topped up with approximately 110 tonnes of imported armour stone (1.5-3.5 tonnes) to elevation +1.0

EXISTING REEF 4

Reef 4 shall be topped up with approximately 100 tonnes of imported armour stone (1.5-3.5 tonnes) to elevation +1.0.

The Contractor shall:

- Use equipment suitable for handling stone of the specified size. Handle the material in such a manner to minimize damage to the stones and the structure, and to minimize disturbance, slumping and degradation of the adjacent materials and/or underlying seabed.
- Dumping and dozing of stone materials will only be allowed if it can be demonstrated that the resulting gradation meets the requirements specified herein, including the maximum allowable percentage below the minimum stone size.
- Place material uniformly within the lines and grades indicated on the drawings.
- Handle the material and place in such a manner as to minimize segregation and provide a well graded mass.
- Perform shaping and finishing to the required tolerances, as well as verification surveys of intermediate stone courses, immediately prior to the commencement of placement of overlying stone courses.

6) **SECTION 1200 - MISCELLANEOUS**

(Item 130935 – Temporary Access Berms)

This item shall be for the supply, loading, transporting, placement, and removal of two temporary access paths as described in the detail on Sheet C02. The contractor is responsible to remove all materials used to construct the temporary access berms once reef construction is complete. Measurement for payment shall be measured as a lump sum and shall include all labour and materials required to install both of the temporary access paths (Reefs 6 and 7). Upon removal of material, all material shall become property of the contractor.

**SCHEDULE B
IDENTIFICATION OF PRINCIPALS**

Name of Contractor:

Mailing Address:

Telephone:

Email:

Principal's Name:

Title:

Mailing Address:

If Contractor is a corporation in which province of Canada is the corporation registered:

**Department of Transportation and Infrastructure
Province of Prince Edward Island**

Schedule C

schedule of item for tender

Item Description and Price	Estimated Quantity	Contractor Total Price
SAND FILL		
Section: 206 Item: 20614		
-----	PER Tonnes	
-----	\$ -----	5,730.00 \$
-----	100	-----
BEDDING STONE		
Section: 213 Item: 21330		
-----	PER Tonnes	
-----	\$ -----	380.00 \$
-----	100	-----
ARMOUR STONE (1.5-3.5 TONNES)		
Section: 213 Item: 21333		
-----	PER Tonnes	
-----	\$ -----	4,010.00 \$
-----	100	-----
TEMPORARY ACCESS BERMS		
Section: 1300 Item: 130935		
-----	PER L.S.	
-----	\$ -----	1.00 \$
-----	100	-----

Total Carried Forward \$ -----

From Previous Page

Total Carried Forward \$ -----

HST \$ -----

Grand Total \$ -----

SCHEDULE D
SCHEDULE OF EQUIPMENT TO BE USED ON THE WORK


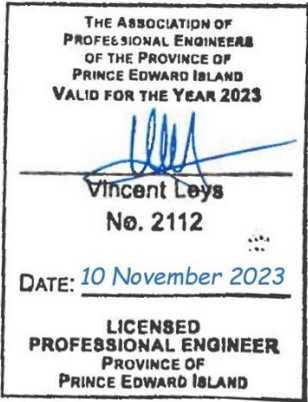
SCHEDULE E
SCHEDULE OF SUB-CONTRACTORS

SCHEDULE F
SCHEDULE OF SUPPLEMENTAL SPECIFICATIONS

(Sand Fill, Armour Stone and Bedding Stone – 21 pages)

Cedar Dunes Shoreline Restoration

Rev.	Issue	Reviewed By:	Date	Issued By:
	Issued for Tender	JAD	10-Nov-2023	VL

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PART 1 - GENERAL

1.1 WORK INCLUDED

- .1 This section specifies requirements for the stockpiling and placing for all granular materials, common fill, including sand, structural fill and other granular materials. Work includes supply of products, transportation, stockpiling, placing, compacting, and shoring.

1.2 REFERENCE STANDARDS

- .1 ASTM D698-12 (R2021), Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))
- .2 ASTM D4253-16e1, Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
- .3 ASTM D4254-16, Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
- .4 CAN/CSA A23.1:19/A23.2:19, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard for Concrete.
- .5 Prince Edward Island Department of Transportation and Infrastructure's General Provisions and Contract Specifications for Highway and Bridge Construction, latest edition at time of tender.

1.3 DEFINITIONS

- .1 Sand: hard, granular, founded, or sharp material, well graded, free of silt impurities and chemicals or organic matter ranging in size from 0.16mm to 5mm.

1.4 SUBMITTALS

- .1 Submit samples, sieve analysis, mix design, and the like to the Engineer for review of the sizes and quantities. Do not deliver materials to the Site for use until samples are approved in writing by the Engineer. Provide such samples without charge.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Beach sand:
 - .1 Screened from local excavation or imported from a local source.
 - .2 Clean, light brown, poorly graded (well sorted), medium to coarse sand.
 - .3 Median grain size (D50) of 0.2 to 0.5 mm.
 - .4 Fines less than 5% (material less than 0.16mm).
 - .5 Gravel less than 5% (material larger than 5mm).
 - .6 Free of debris, sharp rocks, concrete rubble, clay, and organic material.

PART 3 - EXECUTION

3.1 BEACH FILL
PLACEMENT

- .1 The general intent of the work is to fill and grade the beach areas to the neat lines as shown on the Contract Drawings. It is noted that the shape and slope of the beach fill may vary due to natural processes. In particular, storm waves may cause changes to the shape and slope of the beach fill.
- .2 Place fill material on the beach to the lines, grades and cross-sections as shown on the Contract Documents, unless otherwise provided for herein or directed by the Engineer.
- .3 The Engineer reserves the right to vary the lines and grades of the beach fill from the cross sections shown on the Contract Drawings. The cross sections shown on the Contract Drawings are for the purposes of estimating the volume of fill required for the project, and will be used by the Engineer in making any changes to the lines and grades.
- .4 Provide the dressing specified below:
 - .1 Dressing for Verification - Immediately following placement of the beach fill, grade, level and dress the fill to meet the required elevations and dimensions shown on the Contract Drawings. Dressing for verification to include the removal of humps, depressions, undrained pockets, vehicle access ramps and other temporary works, and must be completed prior to

the verification surveys being undertaken.

.2 Dressing for Final Acceptance - This final dressing is a requirement of the post construction cleanup. Grade the seaward slope of the beach fill down to a slope not steeper than ten (10) horizontal to one (1) vertical. Remove grade stakes intact, and backfill any excavation required to remove the stakes.

.5 The top surface and seaside slope of the beach fill material to meet the tolerances specified herein.

.6 Compaction of beach fill is not required.

3.2 EXCAVATION

.1 Excavate all types of materials to lines and elevations indicated and as necessary for construction.

.2 Notify the Engineer if in doubt as to definition of material.

.3 When rock is encountered, notify the Engineer for measurement.

.4 Select method of excavation, support, and dewatering unless otherwise indicated or directed. Protect property and structures from damage.

.5 Handle materials in a manner that will not endanger the public, personnel, property or the work. Do not reduce sight distances or obstruct roadways or utilities. Do not obstruct flow of surface drainage or natural watercourses.

.6 Take care to protect granular material from the elements.

.7 Do not stockpile materials alongside of excavations in such manner that stockpiling will cause side failure or bottom uplift.

.8 Replace over excavation of trench bottom with selected site material, granular material, or beach sand fill as directed.

.9 Notify the Engineer whenever unsuitable

materials are encountered and remove to depth and extent directed.

.1 If such work is due to nature of soil, the Engineer and Contractor will jointly measure work for payment.

.2 If such work is due to any act or fault of the Contractor remedial work is responsibility of Contractor.

.10 Dispose of unsuitable materials off site.

.11 Stockpile cobble, beach sand and other excavated material in the areas indicated on the drawings.

3.3 UNSUITABLE
EXCAVATION

.1 When unsuitable is encountered notify the Engineer for measurement and assist in investigation to determine depth and type of material. Isolate area to minimize entry of water into excavation.

.2 Excavate unsuitable to extent directed.

.3 Dispose of material unsuitable for reuse off site.

3.4 BLASTING

.1 Blasting is not permitted.

3.5 TOLERANCES

.1 Final grade for beach fill shall be within 0.15m (plus or minus) of the lines shown on the Contract Drawings. This tolerance shall extend across the full width of the beach fill to the intersection of the fill with the pre-construction surveyed condition. Elevations may not be uniformly high or low.

.2 Contractor may stockpile beach fill above the 0.15m upper tolerance up-slope to compensate for material expected to be removed by wave action, but smooth slopes shall be maintained.

.3 If any material is deposited in areas not designated or approved for fill, remove such material and redeposit it as directed by the Engineer at no additional expense to the Contract.

- .4 The intention of the above tolerances is that the work will be built generally to the required elevations, slopes, and grades and that the outer surfaces shall present a neat and aesthetic appearance. Remove or re-work placed material not meeting this intent as directed by the Engineer.

PART 1 - GENERAL

- 1.1 Scope Of Work .1 This section covers the supply, transport and placement of armour stone and bedding stone to build new reef structures.
- 1.2 References .1 ASTM C88-18, Test Methods for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate
- .2 ASTM C127-15, Test Method for Specific Gravity and Absorption of Coarse Aggregate
- .3 ASTM C136-19, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- .4 ASTM C535-16, Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- .5 ASTM D5312/D5312M-12 (R2013), Test Method for Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions
- .6 ASTM D5240/D5240-20, Standard Test Method for Evaluation of Durability of Rock for Erosion Control using Sodium Sulphate or Magnesium Sulphate.
- .7 ASTM D5313/D5313M-21, Test Method for Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions.
- .8 Prince Edward Island Department of Transportation and Infrastructure's General Provisions and Contract Specifications for Highway and Bridge Construction, latest edition at time of tender.
- .9 CIRIA, CUR, CETMEF. (2007). The Rock Manual - The Use of Rock in Hydraulic Engineering, 2nd Edition.
- 1.3 Definitions .1 In describing stone construction, reference will be made to Courses, Neat Lines, Survey Control Lines, Quality Control and Quality Assurance. The following definitions will pertain to these terms:
- .1 Course: A course of stone is defined as the

overall thickness for the given stone classification as shown on the Contract Drawings.

.2 Neat Lines: These are the lines shown on the drawings which depict the limits of the various types of stone materials. The tolerances for stone placement, as described in this section, will be measured from the neat lines.

.3 Survey Control Lines (SCL): These are the lines to which all stone structure surveys shall be referenced.

.4 Quality Control (QC): Contractor is responsible for the development and implementation of a QC program throughout the project to assure compliance with the specifications.

.5 Quality Assurance (QA): QA activities will be performed jointly by the Contractor and the Engineer. These activities are intended to provide independent observations of conformance to the specifications, and in no way relieve the Contractor of their responsibilities for Quality Control.

1.4 Source Approval

- .1 Source(s) of all stone materials to be incorporated into the work requires the approval of the Engineer.
- .2 Inform the Engineer of proposed source(s) of materials and submit stone quality test results at least one (1) week prior to shipping material to site.
- .3 Individually select armour stone at the source and mark for delivery to the site.
- .4 Acceptance of material at the source does not preclude future rejection at the site if it fails to conform to the requirements specified.

1.5 Stone Materials
QC/QA Program

- .1 Quality Control (QC) Program:
 - .1 Establish and maintain Quality Control for all stone production, including hauling and placement under this contract to maintain compliance with the specifications.
 - .2 Exercise care in loading, hauling, unloading and placing of stone during all phases of construction to prevent cracking and splitting that would otherwise lead to rejection at the job site.

.3 Maintain a daily log, compiled in tabular format, presented in a clear and legible fashion indicating the following as a minimum:

- .1 Quantity of stone produced to date for each stone type,
- .2 Quantity of stone shipped to date for each stone type.
- .3 Loading trucks with stone from one classification only.
- .4 Maintaining separate stockpiles of stone materials by stone classification. Stone may only be shipped to the site from stockpiled materials.
- .5 Visually inspecting all armour stone for blast fractures, size and quality factors to verify that stone meets the quality requirements of this section.
- .6 Conducting stone gradations and quality/durability tests, and making appropriate production modifications on each stone classification as required to verify that they meet the gradation and geometric requirements of this section.

.2 Quality Assurance (QA) activities:

- .1 Quality Assurance activities will be performed jointly by the Contractor and Engineer. These activities are intended to provide independent observations of conformance to the requirements of this section prior to shipment of the stone to the site, and in no way relieve the Contractor of their responsibilities for Quality Control (QC) and in-place requirements.
- .2 The Engineer may also perform supplementary Quality Assurance (QA) activities at the project site.

1.6 Stone Gradation .1
Test Requirements

Armour Stone and Bedding Stone:

- .1 It is anticipated that at least one (1) Quality Assurance gradation test will be conducted for each of the armour stone classes designation used in the Project, unless gradation test results or observations of stone materials indicate additional gradation tests are required.

- .2 The Engineer will randomly select a representative sample of stone designations. For each of the armour stone class sample sizes will

be as follows unless otherwise determined by the Engineer:

<u>Armour Stone Class Designation</u>	<u>Number of Armour Stone Pieces</u>
1.5 to 3.5 tonne	16
Bedding layer	50

.1 Weigh the total sample to within 1%. Each individual stone in the sample will then be measured along three mutually perpendicular axes (dimensions a, b and c; a is the maximum length of the stone, b is the maximum width perpendicular to the long axis and c is the thickness of the stone perpendicular to the plane of the a and b axis) and the measurements recorded. Individual stone weights will then be initially estimated based on the measured volume (e.g., measured volume = a x b x c) multiplied by the saturated surface dry (SSD) stone density for that stone type. Adjust the individual initial estimated weights by an adjustment factor equal to the ratio of the actual total sample weight divided by the sum of the individual initial estimated weights. The resulting adjusted stone weights will be used to assemble a gradation curve for the sample. Alternatively, the Contractor may elect to weigh every stone in the sample, in which case the gradation curves will be assembled using the actual measured stone weights.

.2 Provide loaders, certified scales, other equipment, and operators of such equipment as required to gather samples and measure/weigh each individual stone. Notify the Engineer and allow access for the Engineer to witness sampling. Methods used to weigh each individual stone must be accurate to ± 5 kg for stones larger than 50 kg, and to ± 0.5 kg for stones smaller than 50 kg.

1.7 Stone Placement .1
QC/QA Program

Quality Control (QC) Program:

.1 Establish and maintain Quality Control for all work performed at the job site to assure compliance with the specifications.

- .2 Maintain records of all Quality Control tests, surveys, inspections, and corrective actions, and submit copies to the Engineer.
- .3 Handle, transport and store stone to ensure that stockpiles are not contaminated with other soils and materials and to limit the segregation of material sizes.
- .4 Provide range poles, marker buoys, templates, batter boards and/or any other means of guidance and control as necessary to construct the stone courses to the required tolerances.
- .5 Maintain temporary vertical and horizontal control monuments in the immediate vicinity of the work being performed.
- .6 Perform construction surveys as necessary to perform the work required by the Contract Documents. Equipment and methods by which construction surveys are performed are the Contractor's option.

.2 Quality Assurance (QA) Activities:

- .1 Perform verification surveys as the work progresses to verify that lines, grades and thicknesses for the completed work are within the specified tolerances. Perform verification surveys with a GPS Topographic Survey Equipment, total station survey instrument and range pole-mounted prism; surveyor's level, range pole and surveyor's tape; tag line and sounding basket; or other methods that are consistent with the requirements of this section and subject to the approval of the Engineer. Fit range poles, if used, with a flat, durable base, the dimensions of which are subject to the approval of the Engineer. Provide personnel and other equipment necessary to adequately and safely perform verification surveys.
 - .2 Conduct verification surveys in the presence of the Engineer unless waived by the Engineer.
 - .3 Survey existing conditions (i.e. original and excavated beach or seabed) prior to placement of stone materials. At a minimum, locate survey lines at the cross sections shown on the drawings, with elevation readings taken every 2m along each line, and at every break in grade. Extend surveys at least 3m (horizontally) beyond the extents of the proposed stone work.
 - .4 Survey each stone course following placement. Measure survey lines at the same locations as the existing conditions surveys.
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Take elevation readings every 2m along each line, and at every break in grade. Extend surveys at least 3m (horizontally) beyond the extents of the stone work.

.5 Horizontally reference verification surveys to the Survey Control Line (SCL) and vertically reference to Canadian Geodetic Vertical Datum of 2013 (CGVD 2013).

.6 For each verification survey performed, transmit a verification survey record containing the following information to the Engineer:

.1 Structure and stone type surveyed;

.2 Verification survey location (with respect to SCL's;

.3 Date and time of survey;

.4 Weather conditions;

.5 Names of participants;

.6 Field notes;

.7 Cross-section plot showing SCL, neat lines and individual elevation readings referenced to CGVD2013.

.7 The exact format of the verification survey record is subject to the approval of the Engineer. Submit a sample to the Engineer for approval prior to the commencement of stone placement and to include transmittal of the verification survey ASCII file upon completion of the placement of each stone course of each reef structure and shore connection.

.8 Before any stone placement over existing grade, excavated grade or a previously placed stone type, surveys of the existing grade, excavated grade or previously placed stone type must be verified by the Engineer, with frequency at the discretion of the Engineer.

.9 Approval of a cross-section does not constitute final acceptance.

1.8 Production
Schedule

- .1 All stone materials must be produced and prepared for delivery according to the approved construction schedule.

1.9 Submittals

- .1 At least two (2) weeks prior to the commencement of stone placing operations, submit the intended construction procedures to the Engineer. These procedures must contain the following information as a minimum:
- .1 Material sources and test results for stone materials in accordance with the requirements of

this section.

.2 Method of transport for stone materials.

.3 Details of the intended stone placement methods and sequence.

.4 Survey control and verification survey procedures.

.2 Submit gradation test results, stone quantity tabulations, or other data required for the stone Quality Assurance program at any time during the project as requested by the Engineer or as directed by the Contract Documents.

.3 Make stone source inspection and loading facility logs available at any time during the project for review by the Engineer.

1.10 Waste
Management and
Disposal

.1 Separate and recycle waste materials in accordance with item 104 of the Prince Edward Island Department of Transportation and Infrastructure's General Provisions and Contract Specifications for Highway and Bridge Construction and as supplemented herein.

.2 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.3 Divert unused geotextiles from landfill to plastic recycling facility as approved by the Engineer.

.4 Divert unused metal materials from landfill to metal recycling facility as approved by the Engineer.

.5 Divert unused concrete materials from landfill to local quarry facility as approved by the Engineer.

.6 Fold up metal handling, flatten and place in designated area for recycling.

1.11 Interference
to Navigation

.1 Be familiar with vessel movements and fishery activities in area affected by construction operations.

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- .2 Plan and execute work, in a manner that will not impede navigation, including movement of vessels at the facility.
- .3 Plan and execute work, in a manner that will not interfere with fishing operations or access to marine structures by land or water.
- .4 The Engineer or Owner will not be responsible for loss of time, equipment, material or any other charges related to interference with moored vessels in the harbour or other Contractor's operations.
- .5 Keep the Marine Communications and Traffic Services Centre, Fisheries and Oceans Canada, informed of construction operations, in order that necessary notice to Mariners may be issued.
- 1.12 Regulatory Requirements .1 Comply with municipal, provincial and national codes and regulations relating to project.
- 1.13 Existing Conditions .1 It is important that Contractors intending to bid on Work visit the site and ascertain what preparatory work will be required to complete the Work as shown on the Project Drawings. Be aware of:
- .1 Condition of existing structures over which material must be hauled.
- .2 Preparation, maintenance and removal of temporary roadways for the use of trucks, cranes, excavators, draglines, etc.
- .3 Preparation, maintenance and removal of all temporary access berms, causeways and/or fills as required for trucks, loaders, excavators, cranes, draglines, etc.
- .4 Exercise extreme care to prevent damage to the land.
- .5 The requirement to construct and maintain access berms and haul roads. Remove all temporary access berms and haul roads at the completion of the project and restore the land to its original condition unless noted otherwise.
- .6 Include all costs associated in unit rates.
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PART 2 - PRODUCTS

2.1 General

- .1 All stone materials meet all requirements specified in this section of the specifications. The Engineer, at any time during the Contract, may reject materials at the source or at the project site for failure to meet the specified requirements. Acceptance of material at the source does not preclude future rejection at the site if it fails to conform to the specified requirements. Remove materials that have been delivered to the project site and are rejected, whether in stockpile or in place in a structure, from the project.
- .2 Scale all loads prior to delivery. Stockpile material on site no more than once prior to final placement.
- .3 Provide to the Engineer the planned quarry location and allow the Engineer access to the site during quarrying operations.
- .4 Prior to use, all quarried material will be subject to inspection by the Engineer to determine if suitable. The hardness and durability of the stone is a critical factor and care must be taken to assure that the stone quarrying produces durable, sound rock with minimal visible fine bedding planes. Payment for this item will be full compensation for supply, loading, transporting and placement.

2.2 Stone Quality

- .1 General:
 - .1 Stone to be dense, hard, sound, close-grained, durable rock, free of overburden material, and resistant to weathering and disintegration under freezing/thawing and wetting/drying conditions and be of a quality to ensure permanence of the structure in the climate in which it is to be used.
 - .2 All stone must be free from detrimental cracks must have minimal visible fine bedding seams and other defects that tend to increase deterioration from natural causes or cause breakage in handling and/or placing. Stone with high argillaceous or shale content is more susceptible to weathering, abrasion, thin bedding, close fracturing and other undesirable

rock properties and will not be accepted.

.3 Stone to be free from damage as a result of blasting during production. Blast damage is a significant cause of rejection of stone. Blast cracks that have the potential of causing more than 20% loss of weight of an individual stone, if the crack opens in service, are not acceptable. Stones with minor cracking may be reworked at the Contractor's option, with cracked portions being removed by jacking or other suitable method. The remaining stone, if within the gradation limits, may be re-evaluated for acceptance.

.2 Stone Quality/Durability Tests:

.1 Test stone materials to be used in Work for quality/durability during quarry start-up and production operations.

.2 Imported stone from outside PEI for Reef structures #6 and 7: The following rock durability test specifications must be met or exceeded by all stone materials:

Specific Gravity minimum 2.65 and

Absorption maximum 2.0%.

Slate, sandstone, shale and stone containing mica are not acceptable for armourstone or bedding stone. Actual specific gravity and absorption will be determined by testing selected samples of material being incorporated into the works. Materials with a specific gravity less than required minimum specified above or an absorption rate in excess of 2% will be rejected.

.3 Obtain test samples of the proposed stone at no additional expense to the Contract. Samples selected for testing will be representative of material formations in the quarry to be used for this project. The Engineer must be present for and agree upon the selection of all test samples prior to shipment. The Engineer may personally select all samples if they so elect.

.4 Ship or deliver the samples, at no additional expense to the Contract, to a suitable testing facility.

.5 Allow sufficient time for the testing to be completed such that there are no delays in the start of construction.

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- .6 Previous test results for stone materials quarried from the same area (ie. the same working face and rock unit) of the quarry may be accepted at the discretion of the Engineer.
- .7 Submit stone quality test results at least one (1) week prior to shipment of stone to site.
- 2.3 Gradation and Shape Requirements
- .1 Place material meeting the gradation and shape requirements listed below in the work at the locations as shown on the Contract Drawings. Gradation limits are in-place requirements. Make adjustments in production, transportation and placement methods as necessary to assure final placed materials are within specified ranges. Stone to be well graded, and not exhibit gap grading or scalping from individual size ranges. Armour stone and bedding stone outside the specified grading ranges may be acceptable at the discretion of the Engineer.
- 2.4 Armour Stone
- .1 Armour stone to be angular in shape, with the ratio of maximum to minimum dimensions (aspect ratio) not exceeding 2.0.
- .2 Armour stone class designation '1.5 to 3.5 tonne' to conform to 2.5 tonne median weight and:
- .1 No more than 5% must be less than 1,000kg.
 - .2 No more than 10% must be less than 1,500kg.
 - .3 No less than 70% must be less than 3,500kg.
 - .4 No less than 97% must be less than 4,500kg.
- 2.5 Bedding Stone
- .1 Pit run or quarried material rough and angular in shape requiring approval by the Engineer prior to being used in the work.
- .2 Material not to contain organic matter, frozen lumps, sod, roots, logs, stumps, or any other objectionable matter.
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- .3 Bedding stone gradation must be within the following limits:

IMPERIAL SIZE	METRIC SIZE	% PASSING BY MASS
18"	450 mm	100
8"	200 mm	44 - 75
4"	100 mm	25 - 50
2"	50 mm	7 - 14

- .4 Material to be screened and washed, if required, to allow for no fines or stones less than 0.2 kilograms are placed in the work.
- .5 Material to be blended so that a homogeneous mix of smaller and larger sizes within the approved range is attained.

PART 3 - EXECUTION

3.1 Excavation and Grading

- .1 If required, excavate and/or grade seabed to lines and grades shown on the drawings in such manner that stone layers/courses can be placed to the required thicknesses and grades.

3.2 Bedding Stone

- .1 Use equipment suitable for handling stone of the specified size. Handle the material in such a manner to minimize damage to the stones and the structure, and to minimize disturbance, slumping and degradation of the adjacent materials and/or underlying seabed.
- .2 Dumping and dozing of stone materials will only be allowed if it can be demonstrated that the resulting gradation meets the requirements specified in Section 2.3 herein, including the maximum allowable percentage below the minimum stone size.
- .3 Place material uniformly within the lines and grades indicated on the drawings and within the tolerances described in this section.

- .4 Handle the material and place in such a manner as to minimize segregation and provide a well graded mass.
- .5 Perform shaping and finishing to the required tolerances, as well as verification surveys of intermediate stone courses, immediately prior to the commencement of placement of overlying stone courses.

3.3 Armour Stone

- .1 Use equipment suitable for handling armour stone of the specified size. Handle the material in such a manner as to minimize damage to the stones and the structure, and to minimize disturbance, slumping and degradation of the adjacent materials and/or underlying seabed. Excessive drops or tumbling of stones will not be permitted.
- .2 Place armour stones individually in a manner that best utilizes the natural shape of the stone within the grades and tolerances specified.
- .3 Commence placement at the toe of the slope and proceed upwards. Place each stone so that it is stable, secure and supported by stones below. Offset gaps between stones in adjacent layers.
- .4 The armour stones must be stable, tightly placed and interlocked together, with stone to stone contact and no overhanging or loose stones. Select, rotate, rehandle after initial placement, and replace stones as required to achieve a stable and interlocked mass to the Engineer's satisfaction and approval.
- .5 Remove undersize material, including that resulting from breakage, as determined by the Engineer, at no additional expense to the Contract.
- .6 Do not place armour stones over snow or ice.
- .7 Select and sort stones during placement as required to meet these placement specifications.

3.4 Tolerances

- .1 Consider the layer thicknesses and slopes shown on the Contract Drawings the target thicknesses and grades.

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- .2 Completed component layers to be within following tolerances of line and grades indicated:
- .1 Bedding stone: plus or minus 200 mm
 - .2 Armourstone 1.5 to 3.5 tonne above -1.0 m (dry): plus or minus 300 mm
 - .3 Armourstone 1.5 to 3.5 tonne below -1.0 m (wet): plus or minus 400 mm
 - .4 Armourstone structure crest elevation: Minimum design elevation not to be uniformly high or low.
- .3 The tolerances of two (2) consecutive finished surface profiles must be positive.
- .4 Tolerances outside the limits prescribed above may be acceptable at the discretion of the Engineer.
- .5 Layer thicknesses should not be less than 80 percent of the design thicknesses.
- 3.5 Protection
- .1 Conduct all necessary repairs to the work during construction, including reshaping of slopes and replacement of materials displaced by waves, currents or any other cause.
 - .2 Take into account anticipated weather conditions and degree of exposure of site in setting requirements for protection.
 - .3 Schedule and carry out construction so that each phase of work is not left exposed longer than necessary. Do not extend bedding stone material for structures more than 10 metres beyond armourstone protection.
 - .4 Progress of placement of stone to be recorded daily by the Engineer with Contractor's concurrence. Replacement of material lost due to storm wave action or tidal erosion damage to be based on daily journal of work progress and will be considered incidental to the Work.
- 3.6 Roadways and Access Berms
- .1 Construction, maintenance and removal (as required) of working roadway and access berm layers to be the responsibility of the Contractor and will be considered incidental to the Work.
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- .2 Carry out construction, maintenance and removal of access berms, causeways, fills, etc. as required.

- .3 Build temporary berms for access to reefs using bedding stone or clean sandstone free of all fines, min size 150 mm. Remove temporary access berm(s) (as required) after construction, and reinstate beach to its original condition in area outside of the project area, and to the sand fill lines shown inside the project area.