

Tender No. []

1.0 GENERAL

1.1 DETAILED DRAWINGS

- .1 The following detail drawings are appended hereto and form part of this section.

| <u>Number</u> | <u>Title</u> |
|---------------|--------------------------------|
| 02374.01 | Gabion Basket Assembly Details |
| 02374.02 | Gabion Mat Assembly Details |

1.2 REFERENCES

- .1 Provide gabions in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

| | | |
|----|----------------|--|
| .1 | ASTM A313 | Specification for Chromium-Nickel Stainless and Heat-Resisting Steel Spring Wire. |
| .2 | ASTM A641/641M | Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire. |
| .3 | ASTM B117 | Standard Practice for Operating Salt Spray (Fog) Apparatus. |
| .4 | ASTM D412 | Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension. |
| .5 | ASTM D746 | Standard Test Methods for Brittleness Temperature of Plastics and Elastomers by Impact. |
| .6 | ASTM D792 | Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement. |
| .7 | ASTM D1242 | Standard Test Methods for Resistance of Plastics to Abrasion. |
| .8 | ASTM D1499 | Standard Practice Filtered Open-Flame Carbon-Arc Type Exposures of Plastics. |
| .9 | ASTM D2240 | Standard Test Methods for Rubber Property – Durometer Hardness. |

.3 Canadian Standards Association (CSA)

| | | |
|----|---------------|--|
| .1 | CAN/CSA-A23.1 | Concrete Materials and Methods of Concrete Construction. |
|----|---------------|--|

1.3 SUBMITTALS

- .1 Provide the following submittals.

Tender No. []

- .2 Product data for the gabions at least 20 days prior to delivering any materials to the Site.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Inspect each shipment of material and timely replace any damaged material.
- .2 Unload, handle, and store materials in accordance with the manufacturer's written instructions to prevent damage to the wire and coating.

2.0 PRODUCTS

2.1 MATERIALS

- .1 Provide materials in accordance with the following.
- .2 Gabion Baskets:
- .1 Mesh: Triple twist wire mesh with hexagonal mesh openings of 80 mm by 100 mm.
- .2 Wire: Galvanized steel wire conforming to ASTM A641, Class 3, Finish 5, soft temper, with a minimum tensile strength of 414 MPa (60,000 psi). Wire diameter (after galvanizing) and zinc coating requirements as follows:

| Wire | Minimum Diameter (mm) | Minimum Zinc Coating (g/m ²) |
|----------|-----------------------|--|
| Mesh | 2.7 | 240 |
| Selvedge | 3.4 | 260 |
| Tie | 2.2 | 210 |

- .3 Diaphragm: In sufficient quantities to construct 1000 mm by 1000 mm compartments within the baskets.
- .3 Gabion Mats:
- .1 Mesh: Triple twist wire mesh with hexagonal mesh openings of 80 mm by 100 mm.
- .2 Wire: Steel wire conforming to ASTM A641, Class 3, Finish 5, soft temper, with a minimum tensile strength of 414 MPa (60,000 psi). Wire diameter (after galvanizing) and zinc coating requirements as follows:

| Wire | Minimum Diameter (mm) | Minimum Zinc Coating (g/m ²) |
|----------|-----------------------|--|
| Mesh | 2.2 | 210 |
| Selvedge | 2.7 | 240 |
| Tie | 2.2 | 210 |

Tender No. []

- .3 Diaphragm: In sufficient quantities to construct 1000 mm by 3000 mm compartments within the mats.
- .4 PVC coating for gabion [baskets] [mats]: 0.5 mm thick PVC with the following properties.

| Property | Requirement | Test Method |
|--|---|-------------------------|
| Colour | [Green] | |
| Specific Gravity | 1.30 to 1.35 | ASTM D792 |
| Hardness | 50 to 60 Shore D | ASTM D2240 |
| Tensile Strength | ≥ 210 kg/cm ² | ASTM D412 |
| Modulus of Elasticity at 100% Strain | ≥ 190 kg/cm ² | ASTM D412 |
| Brittleness Temperature | Not higher than -9°C | ASTM D746 |
| Resistance to Abrasion | < 12% weight loss | ASTM D1242 |
| Salt Spray and Ultraviolet Tests (3000 hour test period) | Free of crack, blisters, splits and change in colour. ≤ 6% change in specific gravity. ≤ 25% change in modulus of elasticity and tensile strength. ≤ 10% change in hardness and abrasion resistance. | ASTM B117 ASTM D1499 |

- .5 Spenex (overlapping) fasteners for gabions: 3.05 mm diameter stainless steel fasteners in accordance with ASTM A313, Type 302, Class I.
- .6 Gabion Rock: Refer to Section 02330 – Earthwork Materials for materials specifications.
- .7 Geotextile: Refer to Section 02342 – Geotextile.
- .8 Concrete Cap: [Minimum compressive strength of 30 MPa at 28 days, using Type 50 Sulphate Resistant Portland Cement, with an air content between 5% and 8%, and a maximum slump of 100 mm.] [Refer to Section [] – Cast-in-Place Concrete.]

3.0 EXECUTION

3.1 PREPARATION

- .1 Provide care of water to permit the work to be carried out in the dry.
- .2 Provide receiving surfaces that are even, and constructed to the lines, grades, slopes, and elevations specified in the Contract Documents.
- .3 Remove any snow, ice, or other deleterious material from the receiving surfaces prior to installing the gabions.
- .4 Place geotextile as specified in the Contract Documents.
- .5 Do not commence installing gabions until the Minister has inspected the receiving surfaces. Rectify defects, including any identified by the Minister.

3.2 ASSEMBLY AND INSTALLATION

- .1 Install the gabions at the locations, in the numbers and sizes, and to the lines, grades, and elevations specified in the Contract Documents. For the gabions, the tolerance from the specified lines, grades, and elevations is +/-50 mm.
- .2 Place, assemble, join, and fill the gabions in accordance with the manufacturer's written instructions, and as specified.
- .3 Assemble the gabion units into box-shaped compartments by joining all untied edges with tie wire or overlapping fasteners. Turn all projections and wire ends into the gabion units.
- .4 Use tie wire or overlapping fasteners to securely connect each unit to the adjoining units along the top selvages and the vertically reinforced edges prior to filling to obtain a monolithic structure.
- .5 Tightly loop the tie wire around every other mesh opening along the seams in such a manner that single and double loops are obtained or use a pneumatic or hand powered tool as recommended by the gabion manufacturer to install overlapping fasteners at a maximum spacing of 100 mm.
- .6 Place units back-to-back and front-to-front to facilitate filling and installation of the lids.

3.3 FILLING

- .1 Use filling methods that do not damage the coating, wires or fasteners.
- .2 Fill the compartments with rock in progressive 300 mm thick lifts and in stages to avoid local deformations. Install connecting wires between lifts within each compartment greater than 500 mm in height. In any compartment, do not place rock more than 300 mm higher than in any adjoining compartment.
- .3 Arrange each layer of rock in the compartments by hand to minimize voids and bulging of exposed faces.
- .4 After each compartment is filled, securely join all sides of the lid to all edges and to the top of the diaphragms.
- .5 Where empty gabion units are placed on filled gabion units, securely join the bottom perimeter of the empty baskets to the top of the filled baskets prior to filling.
- .6 Provide a completed installation that is neat, compact, and square in appearance as required by the Minister.
- .7 Do not allow equipment to travel on the gabions.
- .8 For gabions located on a slope, fill the gabion units progressing from the bottom to the top of the slope.

3.4 CONCRETE CAP

- .1 Place the concrete cap as specified in the Contract Documents such that a minimum penetration of 50 mm of concrete below the wire mesh is obtained. Provide a 50 mm chamfer on the exposed edges of the concrete cap.

Tender No. []

- .2 Place the concrete cap in accordance with and to the tolerances specified in [Section []
– Cast-in-Place Concrete] [CAN/CSA-A23.1].

END OF SECTION