

# Structures

## Master Specification

### ST-RE-C3 Supply and Installation of Gabions, Reno Mattresses and Mesh Panels

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Contents

Contents	2
ST-RE-C3 Supply and Installation of Gabions, Reno Mattresses and Mesh Panels	4
1 General	4
2 Rock fill	4
3 Wire diameters	4
4 Excavation and backfill	5
5 Installation	5
6 Placement of rock fill	5
7 Geotextile	5
8 Tolerances	5
9 Test procedures	6
10 Hold Points	6
11 Verification requirements and records	6

## ST-RE-C3 Supply and Installation of Gabions, Reno Mattresses and Mesh Panels

### 1 General

- 1.1 This Part specified the requirements for the supply and installation of gabions, reno Mattresses and mesh panels, collectively referred to as "Mattresses" in this Part.
- 1.2 Mattresses must be "Macaferri" or equivalent with proven durability and performance which matches or exceeds the required design life, and must be installed at the locations shown on the drawings and / or sketches.
- 1.3 Gabions must be of a woven, double twist 80 mm x 100 mm hexagonal mesh. Reno Mattresses and mesh panels must be of woven, double twist, 60 mm x 80 mm hexagonal mesh. Mesh wire must be galvanized in accordance with AS 4680 or PVC coated.
- 1.4 Documents referenced in this Part are listed below:
  - a) AS 2758.4      Aggregates and rock for engineering purposes Aggregate for gabion baskets and wire mattresses.
  - b) AS 1141.23    Methods for sampling and testing aggregates Los Angeles value.
  - c) AS 1141.25    Methods for sampling and testing aggregates Degradation factor.
  - d) AS 4680        Hot-dip galvanized (zinc) coatings on fabricated ferrous articles.
  - e) DIT             Test Procedure "TP 134" Particle Size Distribution – Standard Method of Analysis by Sieving.

### 2 Rock fill

- 2.1 The rock fill used must be quarried stone and must conform to the following:

**Table ST-RE-C3 2-1 Aggregate dimensions\***

Gabions	Mattress
The minimum rock size shall be 100 mm and the maximum rock size shall be 250 mm	The minimum rock size shall be 75 mm and the maximum rock size shall be two-thirds the thickness of the Mattress, or 250 mm, whichever is lesser

\*NOTE: According to AS 2758.4, it is desirable to ensure mechanical interlocking between rocks; the rock supplied should have a range of sizes and a degree of angularity.

- 2.2 Rock fill shall be igneous and exhibit a massive structure (i.e. dense, clean, hard and free from defects, cracks, seams, cleavage planes, weathering, degradation and pervasive chemical alteration that will affect rock durability). Alternative rock types may be considered by the Principal on a case by case basis and will constitute a **Hold Point**.
- 2.3 Square aperture sieves conforming to the Department's TP 134 "Particle Size Distribution – Standard Method of Analysis by Sieving" must be used for the determination of grading for particle sizes 75 mm and finer. Coarser sizes must be determined by linear measurement. Refer Clause 11 "Verification Requirements and Records" for Los Angeles Value and Degradation Factor requirements.

### 3 Wire diameters

The minimum wire diameters shall be:

- a) Gabions            2.5 mm
- b) Mattresses       2.0 mm
- c) Mesh Panels    2.5 mm
- d) Selvedges        3.4 mm

- e) Lacing Wire 2.2 mm.

## 4 Excavation and backfill

- 4.1 Excavation must be carried out to the extent necessary to allow placement of the Mattresses to the final levels and shape detailed on the drawings and or sketches. After placement of Mattresses, the excavation must be backfilled using excavated material placed in layers of depth not greater than 200 mm loose and compacted to the designer's specification. Compaction within 1 m of the rear of the gabions must be achieved using hand operated vibrating plate compactors.
- 4.2 Backfill shall be conform to the following:
  - a) maximum particle size shall be 75 mm;
  - b) not more than 15% shall be finer than 75 microns;
  - c) pH shall be between 6 and 12;
  - d) resistivity shall be more than 5000 ohm.cm or between 1000 and 5000 ohm.cm where the concentration of chloride is less than 200 ppm and sulphate content is less than 1000 ppm; and
  - e) a full range of particle sizes shall be present.

## 5 Installation

- 5.1 Before placing Mattresses, the surface on which they are to be placed must be shaped and compacted to the designer's specification and filter cloth must be placed as shown on the Drawings. The filter cloth must be Bidim A24, or similar approved, and must be placed and joined in accordance with the manufacturer's instructions.
- 5.2 Mattresses must be formed and installed in accordance with the manufacturer's instructions. All wiring must be done as a continuous operation, not with individual twists at intervals. Tightness of the mesh and wiring is essential at all times. The Contractor must cut or fold Mattresses where required to achieve the configuration and dimensions shown on the Drawings where manufactured units do not comply. The Mattresses which are cut must be fixed so that they have the same integral strength as the uncut Mattresses.
- 5.3 Inspection of placed geotextile and gabion / Mattress baskets prior to rock filling shall constitute a **Hold Point**.

## 6 Placement of rock fill

- 6.1 The placement of rock fill must be carried out to the manufacturer's instructions and in a manner that will avoid damage to the Mattresses.
- 6.2 Rock filling must be firmly packed into the Mattresses. Some hand placing of stone will be required to achieve suitable packing.

## 7 Geotextile

- 7.1 A geotextile shall be provided under reno Mattresses and gabions to prevent fines migration. Visual inspection for geotextile rolls from the Contractor site representatives is required.

## 8 Tolerances

Tolerances for the final placement of Mattresses must be as follows:

- a) Horizontal Placement  $\pm 40$  mm.
- b) Vertical Placement  $\pm 40$  mm.

## 9 Test procedures

The Contractor must use the following test procedures (refer [https://www.dpti.sa.gov.au/contractor\\_documents](https://www.dpti.sa.gov.au/contractor_documents)) to verify conformance with the Specification:

**Table ST-RE-C3 9-1 Test procedures**

Test	Test procedure
Grading	TP 134
Los Angeles Value	AS 1141.23
Degradation Factor	AS 1141.25

## 10 Hold Points

10.1 The following is a summary of Hold Points referenced in this Part:

Document Ref.	Hold point	Response time
2.2	Submission of rock properties and source / quarry area	10 days
5.3	Inspection of placed geotextile and gabion / Mattress baskets prior rock filling	2 hour

## 11 Verification requirements and records

The Contractor must supply written verification that the following requirements have been complied with and supply the verification with the lot package.

**Table ST-RE-C3 11-1 Verification requirements and records**

Document Ref.	Subject	Property	Test procedure	Test frequency	Acceptance limits
2	Rock fill	Grading	Clause 2 TP 134	One test per 50 cubic metres.	Refer clause 2
		Los Angeles Value	AS 1141.23; using laboratory crushed aggregate, conforming to AS 1141.23 grading A.	One test per 50 cubic metres.	Not more than 30%
		Degradation Factor	AS 1141.25	One test per 50 cubic metres.	Not less than 30%