

TECHNICAL SPECIFICATION

- 1. Armourstone: Material
- 1.1 Armourstone shall comply with the following:

Property	Defined and tested in	Acceptability Limits			
	accordance with	Lower Limit	Upper Limit		
Petrographic Description	BS EN 932-3:1997	Unfoliated igneous and metamorphic rocks, quartzites and high silica cement sandstones, compact crystalline limestones			
Mass Distribution	BS EN 13383-2:2002, Clause 6 (Reference method)	HMA _{1000/3000} to BS EN 13383-1			
Shape (Percentage with length to thickness ratio > 3)	BS EN 13383-2:2002, Clause 7	0%	10%		
Particle Density	BS EN 13383-2:2002, Clause 8	2800kg/m³	None		
Compressive Strength	BS EN 1926:2006 Annex A	80MPa	None		
Resistance to Wear (micro-Deval). % loss	BS EN 1097-1:2011	0%	20%		
Water absorption	BS EN 13383-2:2002, Clause 8	0%	2.0%		
Resistance to freezing and thawing	BS EN 13383-2:2002, Clause 9	0%	2.0% loss		
Loss Angeles Coefficient (% loss)	BS EN 1097-1-1996	0%	25%		

2. Armourstone: Survey

- 2.1 Measurement of armourstone layers shall be carried out using a probe with a spherical foot of diameter 0.5D_{n50}. The design profiles shown on the drawings are based on this method of survey. Refer to CIRIA C683 Section 9.9.8 for further information.
- calculated from:

$$D_{n50} = \sqrt[3]{\frac{0.5(NUL + NLL)}{\rho_{app}}}$$

= Nominal stone diameter (cube), m

= mass density of the stone, kg/m³

= Normal Upper Limit of the grading, kg. (Ref BS EN 13383-1)

= Normal Lower Limit of the armourstone grading, kg. (Ref BS EN 13383-1)

3. Armourstone: Placement

3.1 Armourstone shall be individually placed to achieve a dense, fully interlocked armoured slope so that each armour stone is securely held in place by its neighbours. Placing shall commence at the toe and proceed upwards towards the crest. Stones shall be lowered into place individually.

Stones shall be placed in such a way that they obtain their stability from interlocking and $% \left(1\right) =\left(1\right) \left(1\right) \left($ frictional resistance, and not from friction on one plane alone.

- 3.2 Armourstone shall be placed according to "Dense Placement" (as defined in CIRIA C683 Section 9.8.1.1) to achieve a minimum "three-point support" and be stable to the lines and levels shown on the drawings.
- 3.3 Armourstone may be placed with an excavator-mounted five fingered hydraulic grab. Armourstone shall not be placed using an excavator bucket.
- 3.4 The surface of the armoured slope shall present an angular uneven face to the water to achieve the desired energy dissipation of waves. Pieces of armourstone smaller than the equivalent of the Extreme Lower Limit value of the grading shall not be used to fill interstices, or to prop larger stones in order to achieve the desired profile.
- 3.5 Pieces of armourstone broken during handling or placing shall be removed.
- 3.6 The maximum allowable vertical deviation based on individual measurements shall be ±0.3D_{0.50}, 3.7 Measurement shall be in accordance with Clause 2 with profiles taken at 10m intervals along the length of the structure.
- 4 Geotextile
- 4.1 Geotextile shall be HPS11 by Geofabrics
- 4.2 Geotextile shall be stored in accordance with the manufacturer's written instructions.
- 4.3 Geotextile shall be laid on prepared surfaces in accordance with the manufacturer's recommendations. In particular, protrusions that could damage the geotextile shall be removed.
- $4.4 \,\, \hbox{On sloping surfaces, geotextiles shall be laid with the longitudinal axis down the slope.}$
- 4.5 Construction plant shall not operate directly on geotextile.
- 4.6 The minimum overlap shall be 1000mm.

5.1 General fill shall be "Type 1" as defined in Specification for Highway Works Series 800.

 $6.1\,$ Existing gabion baskets shall be removed to the extents shown on the drawings. Gabion steps at the west tie-in shall remain.

7 Setting Out

7.1 The Contractor shall agree the horizontal and vertical alignment of the revetment between the east and west tie ins with the Project Manager. The Contractor shall mark the agreed crest alignment at 10m intervals along the length of the revetment prior to commencement of

- 8.1 Existing drainage pipes shall be neatly terminated at the interface between armourstone layers 1 and 2. This may require cutting or extension of existing pipes.
- 8.2 Prior to commencement of excavations for permanent works in front of the existing stonework wall (east end), the Contractor shall determine the foundation details of the existing wall by local trial hole. The Contractor shall inform the Project Manager of the findings and shall await
- 8.3 The Contractor shall ensure the stability of existing structures that are identified as "retain"

9 Tidal Working

9.1 Astronomical tide levels shown on drawings from Admiralty predictions. Actual water levels may vary due to meteorological/other effects.

SAFETY, HEALTH & ENVIRONMENTAL INFORMATION:

STABILITY OF EXISTING STRUCTURE (GABIONS).

STABILITY OF ARMOURSTONE UNITS DURING PLACEMENT. REFER TO CLAUSE 3

POTENTIAL FOR ADDITIONAL UNKNOWN SERVICES. CONTRACTOR SHALL CONFIRM LOCATIONS PRIOR TO EXCAVATION.

PUBLIC ACCESS ALONG FORESHORE.

WORKING IN INTER-TIDAL ZONE. REFER TO CLAUSE

9.2 Contractor shall make appropriate allowance for working in the intertidal zone and shall sequence and protect partially completed works accordingly.

Rev Date Drawn Description

A 04/09/2018 R Issued for Construction

мотт М MACDONALD

Mott MacDonald Limited 16-18 Bank Street Inverness IV1 1QY United Kingdom

R R

T +44 (0)1463 239 323

Client

10 Henderson Drive Inverness IV1 1SN



Battery Point Coastal Protection

General Arrangement

Designed	Red		R	Eng check	Re		R			
Drawn	Re		R	Coordination	Red		R			
Dwg check	Re	da	R	Approved	Red		R			
Scale at A1 1:250		Status		Rev A		Security STD				

385307-MMD-00-BP-DR-C-0001

STABILITY OF EXISTING STRUCTURE, FOUNDATIONS
OF STONEWORK WALL UNKNOWN BEFFE TO THE STRUCTURE OF STRUC CLAUSE 8.2 & 8.3.

instruction prior to proceeding.

8.4 No toe key into bedrock for 1m either side of the buried outfall pipe.

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