


SHORT FORM DESIGN STATEMENT

 ARCADIS Design & Consultancy for natural and built assets	Project Name	Number and Activity code
	Isles of Scilly – Porthloo	UA008878-ARC-XX-XX-RP-CE-0260-P4

Brief Description:

Porthloo is located on the western side of St. Marys. The bay measures approximately 300m and is flanked to the north and south by rocky outcrops. At southern end of the beach is a boat yard which is protected from wave run-up by an engineered dune which extends half way along the beach. The northern extent of the beach is backed by an earth embankment which retains the road. The embankment is protected by an assortment of various size rocks and is currently susceptible to erosion and overtopping from wave events.



Figure 1: Porth Loo beach & wetland area which feeds into Lower Moors SSSI (Channel Coastal Observatory, 2016)

The aims of the scheme are to reduce the vulnerability of the embanked road from undermining, decrease the risk of coastal flooding to properties and the boat yard located behind the beach and to reduce saline intrusion into the Lower Moors SSSI. This will be achieved by formalising the de-facto rock defence along the northern half of the beach and tying into the existing engineered defence. Therefore the scheme will:

- Increase protection for critical infrastructure (Porthloo Road)
- Increase protection for properties and the boat yard situated behind the beach
- Increase protection for the Lower Moors SSSI

The project will not address any issues associated with the existing engineered defence protecting the boat yard.

Assumptions:

- The proposed works are located above the MHWS mark although the construction area could still be effected by storm events.
- Existing water levels:

	Chart Datum (CD)	Ordnance Datum Local (ODL)
HAT	6.3	3.39
MHWS	5.7	2.79
MHWN	4.3	1.39
MLWN	2.0	- 0.91
MLWS	0.7	- 2.21

- Numerical modelling using MIKE21 software was undertaken to identify the design parameters for the site. The design was undertaken using a 1:200yr joint probability wave and water level event with allowance for climate change, assuming a 50yr design life.
- It is assumed that the existing ground is suitable and accessible for the construction of the new revetment rock armour.
- It is assumed that ground conditions on the foreshore are suitable for placing rock armour without resulting in any significant settlement
- It is assumed that the revetment will tie into the cliffs north of the site and into the existing engineered dune to the south of the proposed works.

Design Basis:

Design water and wave conditions:

SWL (mAOD)	Hs (m)	Tm (s)	Comments
4.14	1.32	11.12	1:200yr joint probability

Retaining Wall

Ground parameters derived from Client provided trial pit logs and an Archaeological Report.

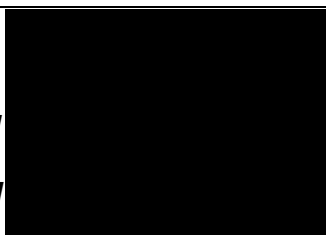
Designer’s Risk Assessment: *incl. Hazards that cannot be designed out. See Designer’s Hazard Record for further information*

- A- Working adjacent to water
- B- Soft & unstable ground
- C- Public beach
- D- Services
- E- Unstable rock armour
- F- Porth Loo SSSI

References: incl.

- CIRIA, CUR, CETMEF (2007). The Rock Manual. The use of rock in hydraulic engineering (2nd edition). C683, CIRIA, London
- Eurotop: Wave Overtopping of Sea Defences and Related Structures: Assessment Manual (2007)
- Reeve, D et al (2004). Coastal Engineering: Processes, theory and design practice. UK: Spon Press
- Kirsty McConnell (1998). Revetment systems against wave attack - A design manual. London: Thomas Telford Publishing.
- Geofabrics - Coastal and River Defence Systems: Design Guidance High Performance Square

Signed:



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