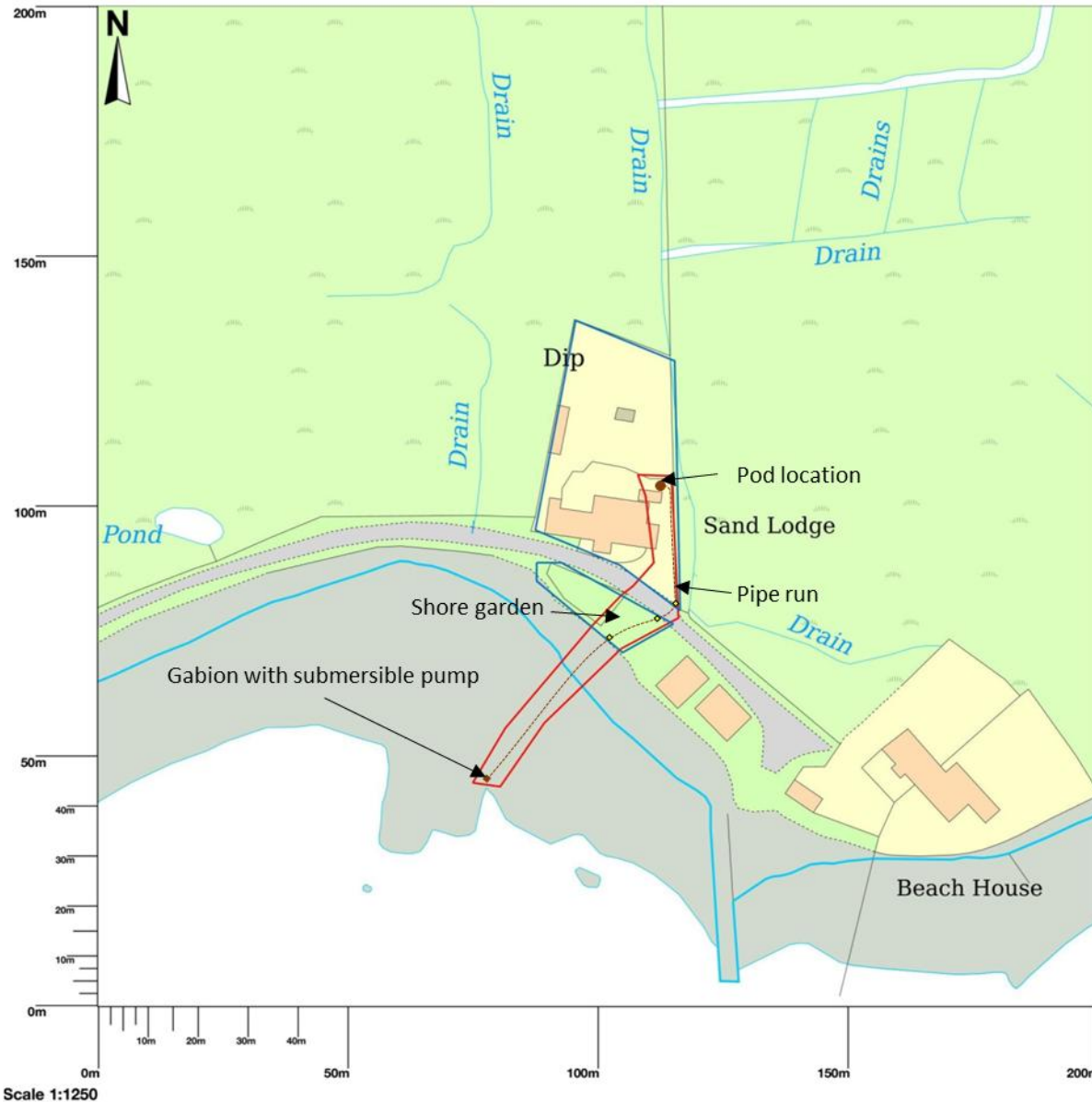


Sand Lodge, Yell, Shetland, ZE2 9DD



© Crown copyright and database rights 2026 OS 100054135. Map area bounded by: 454425,1202610 454625,1202810. Produced on 08 April 2026 from the OS National Geographic Database. Supplied by UKPlanningMaps.com. Unique plan reference: p4f/uk/1376610/1844658

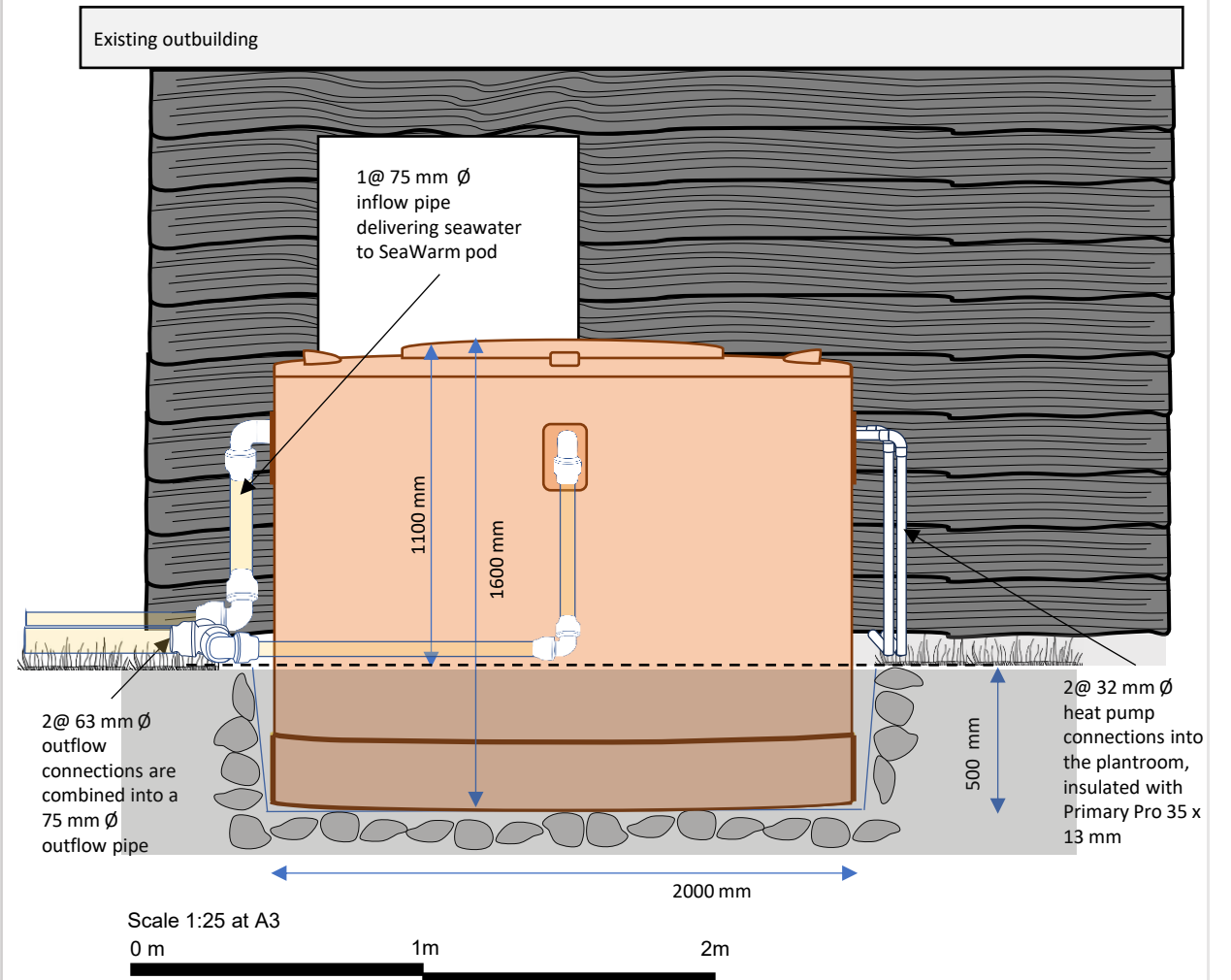


General notes:
All drawings are approximate scales. Measurements should not be taken from these drawings.
Red line boundary is for the works out with the curtilage of the building.
SeaWarm is the contractor installing the seawater intake gabion, intake and outflow pipework, and the SeaWarm pod. The 110 mm drainage pipe under the road will be undertaken by a qualified local contractor with the road reinstated.

Key:
All symbols as described in the notes with each drawing



South Elevation of pod installation
(For information purposes only – within curtilage of building and covered by permitted development rights)



Notes:

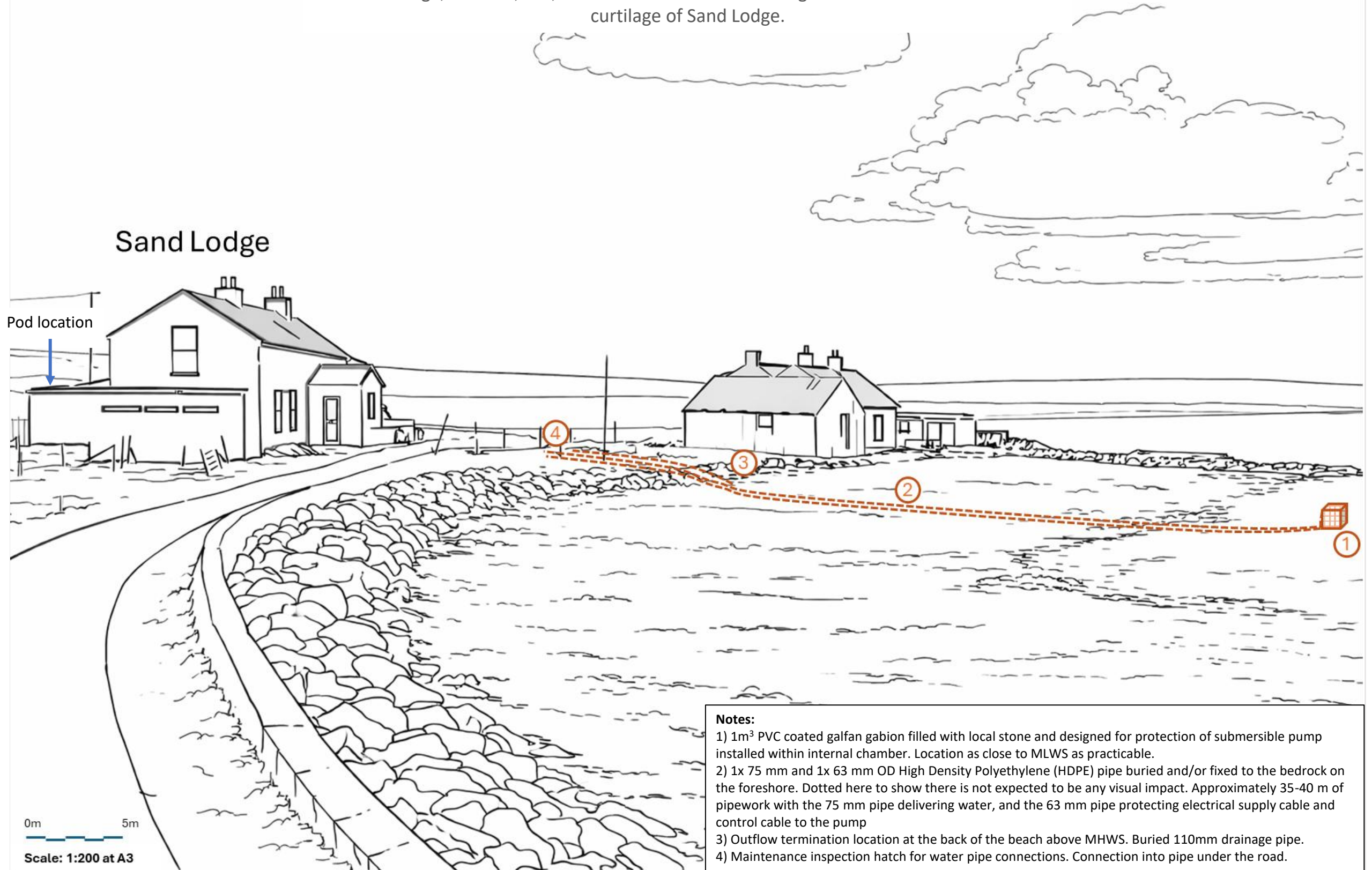
- Works undertaken within the curtilage of the building for understanding of the system. Expected to be covered under permitted development rights.
- SeaWarm pod (13-15 kW internally manifolded model) installed adjacent to outbuilding. Black colour in-keeping with black cladding of outbuilding.
- Located at the back of the property out of view from the road and within the curtilage of the dwelling.
- Pod buried to a *maximum* depth of 500 mm to minimise visual impact and provide easier access for maintenance.
- Excavated area backfilled following installation of pod, local rock infill on base and sides if needed to secure (depending on ground conditions).
- All fittings for seawater delivery to be MDPE/HDPE compression fittings to enable annual maintenance. Installed on surface of ground to maintenance, pipe run to follow edge of outbuilding and perimeter fence. Insulated with
- SeaWarm pod connections to the plantroom (and heat pump) to be 32mm \varnothing HDPE pipe insulated with primary pro 35x13 mm weatherproof insulation.
- 32 \varnothing mm HDPE connections to be electrofusion welded.
- Pipework from pod to road section to run along perimeter fence with insulation, if necessary, and valve boxes installed to allow connection maintenance at the road section.

Project name: Sand Lodge, Cullivoe, Yell, Shetland

Created by: Gus Fraser-Harris


Revision: 1

Sand Lodge, Cullivoe, Yell, Shetland – illustrative drawing of installation out with the curtilage of Sand Lodge.



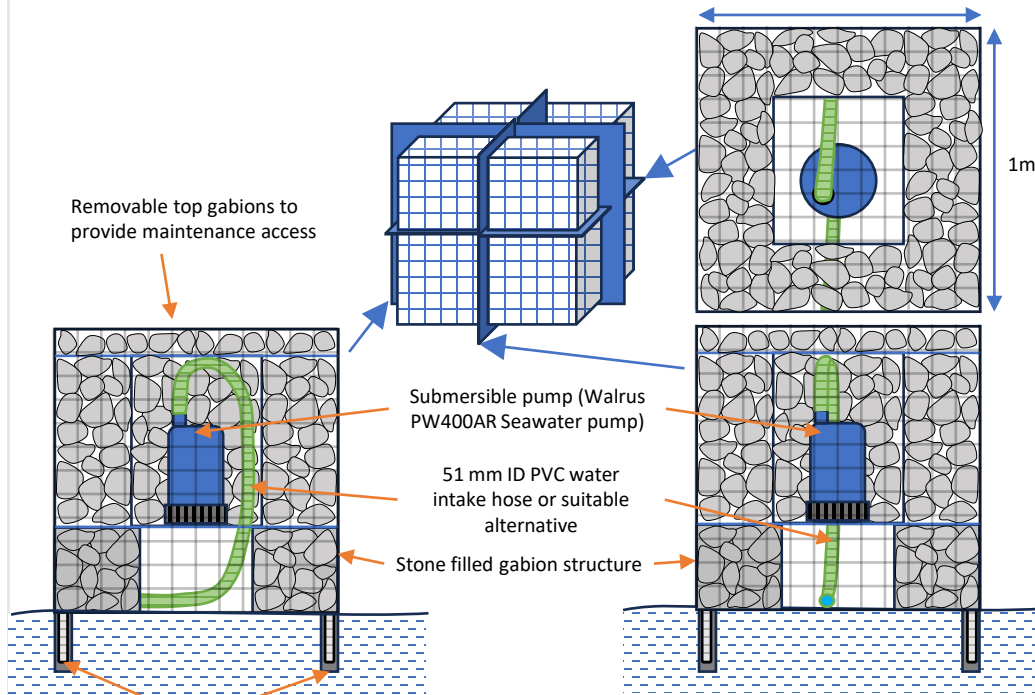
- Notes:**
- 1) 1m³ PVC coated galfan gabion filled with local stone and designed for protection of submersible pump installed within internal chamber. Location as close to MLWS as practicable.
 - 2) 1x 75 mm and 1x 63 mm OD High Density Polyethylene (HDPE) pipe buried and/or fixed to the bedrock on the foreshore. Dotted here to show there is not expected to be any visual impact. Approximately 35-40 m of pipework with the 75 mm pipe delivering water, and the 63 mm pipe protecting electrical supply cable and control cable to the pump
 - 3) Outflow termination location at the back of the beach above MHWS. Buried 110mm drainage pipe.
 - 4) Maintenance inspection hatch for water pipe connections. Connection into pipe under the road.

Additional notes:
 All drawings are to approximate scale – measurements for construction should not be taken from this drawing.
 View looking west towards Sand Lodge and adjacent buildings.
 The only visible construction will be the stone gabion that contains the submersible pump. This will be exposed at low tides but otherwise covered. A buoy will be tethered to the gabion to show its location, if required.
 Detail of gabion construction shown overleaf, along with detail on pipe installation on the foreshore and across the road.

	Project name: Sand Lodge, Cullivoe, Yell, Shetland – West Elevation	
	Created by: Gus Fraser-Harris	Revision: 1

Sand Lodge, Cullivoe, Yell, Shetland – Foreshore installation design details.

Water intake gabion



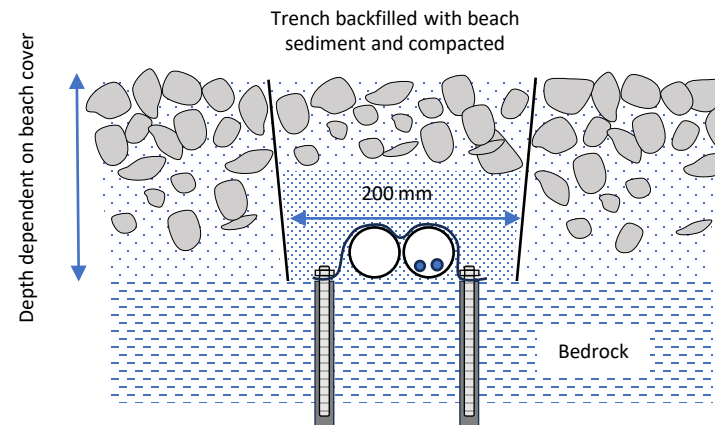
25mm Ø GPR bar anchors
250 mm depth, 500 mm
height in gabion

Notes:

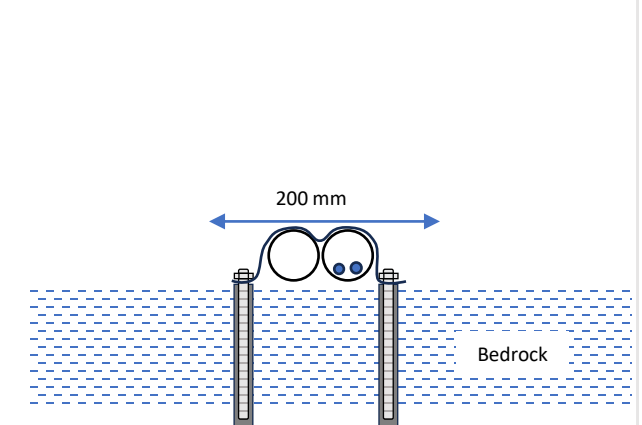
- Stone filled gabion structure using local stone from quarries on Shetland, approximately 100 mm x 100 mm x 100 mm cobbles.
- Resin anchors to hold gabion in place – set 250 mm deep into foreshore bedrock with Sika Anchorfix 2+. 25mm Ø GPR bar in 32mm Ø holes. Total of up to five anchors – one in each corner of gabion, and a fifth in the centre that float switch is fixed to. GPR bar anchors attached to corners of gabion structure with coated stainless steel ties.
- Walrus PW400AR Seawater pump installed in central cavity of gabion suspended above the foreshore to allow for sediment flush through gabion and to prevent sediment build up. Pump to connect to socket in shore garden and powered by RCD protected plug-in control system.
- Flexible intake hose connected to fixed HDPE pipe at edge of gabion to allow for easy maintenance. Alternative solution is a bespoke HDPE pipe section to connect to the pump with minimal joints.
- Electrical connections for submersible pump and float switch to be made up from resin filled SWA cable jointing kit where necessary.

Intake pipe detail - foreshore

Foreshore with beach cover



Foreshore without beach cover



Notes:

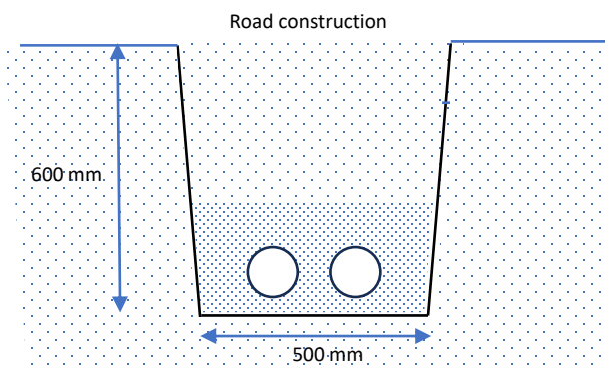
- Trench excavated in beach cover to expose bedrock.
- 2 of 63 mm Ø HDPE pipe (SDR17) fixed to the bedrock with coated 316/A4 stainless steel banding held in place by resin anchors.
- Sika Anchorfix 2+ resin used to secure M8 316/A4 Stainless steel threaded bar and nuts (marine grade). Depth of 160 mm (20x Ø).
- Where bedrock is not found at a depth to maintain appropriate gradient for pipe, pipes will be held in place by ground anchors/stakes
- Pipes covered/buried under beach material and compacted
- 1 of pipes to transport water from submersible pump, 1 of pipes to protect power supply cable and float switch cable.

Notes:

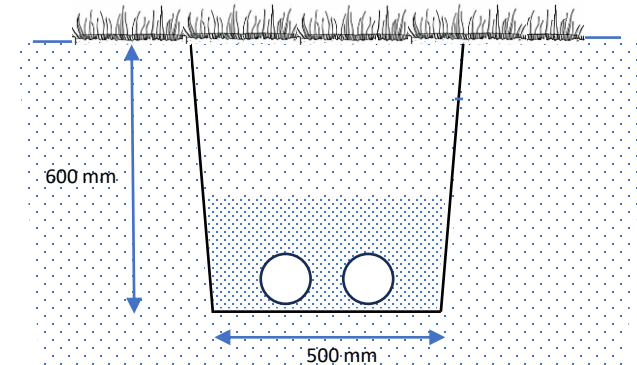
- 2 of 63 mm Ø HDPE pipe (SDR17) fixed to the bedrock with coated 316/A4 stainless steel banding held in place by resin anchors.
- Sika Anchorfix 2+ resin used to secure M8 316/A4 Stainless steel threaded bar and nuts (marine grade). Depth of 160 mm (20x Ø).
- 1 of pipes to transport water from submersible pump, 1 of pipes to protect power supply cable and float switch cable.

Intake pipe detail – road crossing and trench

Road section



Shore-garden section



Notes:

- Trench dimensions to be agreed based on regulations/best practice. 600 mm depth vs 500 mm width shown here.
- 110 mm drainage pipe to connect into 75 mm Ø HDPE pipe on shore (SDR 17)
- 110 mm drainage pipe to host 63 mm Ø pipe with pump power and float switch cables (SWA cable for power supply and 1.5mm² flex for float switch)
- Road section to be completed by a local contractor who will undertake the work to excavate and reinstate the road. The shore-garden section to be excavated and reinstated by SeaWarm.

General notes:

All drawings are approximate scales. Measurements should not be taken from these drawings.

SeaWarm is the contractor installing the seawater intake gabion, intake and outflow pipework, and the SeaWarm pod. The 110 mm drainage pipe under the road will be undertaken by a qualified local contractor with the road reinstated.

Key:

All symbols as described in the notes with each drawing



Project name:

Sand Lodge, Cullivoe, Yell, Shetland

Created by:

Gus Fraser-Harris

Revision:

1

Notes on seawater abstraction

- The system has been designed with a required abstraction rate of 1 litre per second (equivalent to approximately 85 m³/day), to meet the heat demand of the most adverse weather conditions (only expected <1% of the year).
- The system will not operate with continuous abstraction at this peak rate. Instead, it incorporates an intelligent control strategy to optimise flow based on real-time heating and cooling demand. The control system optimises the pump's operational duty cycle to maintain the temperature in the heat exchanger tank. The average abstraction rate over a 24-hour period is expected to be lower than the required maximum for the majority of its operation.
- Due to the tidal nature of the water source, the intake pump will not always be fully submerged. As such, the pump has been specified to deliver flows in excess of 1 l/s when in operation to ensure consistent performance across varying tidal conditions (replenishing the thermal resource in the tank). Abstraction will remain within the defined maximum daily volume of 85 m³/day.



Project name:

Created by:

Revision: