

The NMRN have concerns regarding the condition of the cofferdam fill drainage and associated structures supported on the fill materials, being the Bow Platform and Forward bow access staircase. From previous surveys and inspection, the following SOR has been developed to address the long-term consequences of a poor drainage system to the cofferdam fill below HMS Alliance.

Background

The cofferdam wall and substrate fill were constructed 2010/2011 to which 'HMS Alliance' remains fully supported by the two cradles and driven pile systems (circular constructed 1985). The purpose of the cofferdam is to provide the boat protection from the constant ebb and flow of tidal waters to which on spring tides previously would submerge the keel section. The cofferdam also provides a suitable platform base for future maintenance and access around the hull as well as providing a foundation for the public bow access platform to improve visitor interaction with the boat's Historic fabric.

Bow foundation detail- Extract Drg. 16676/MR/008

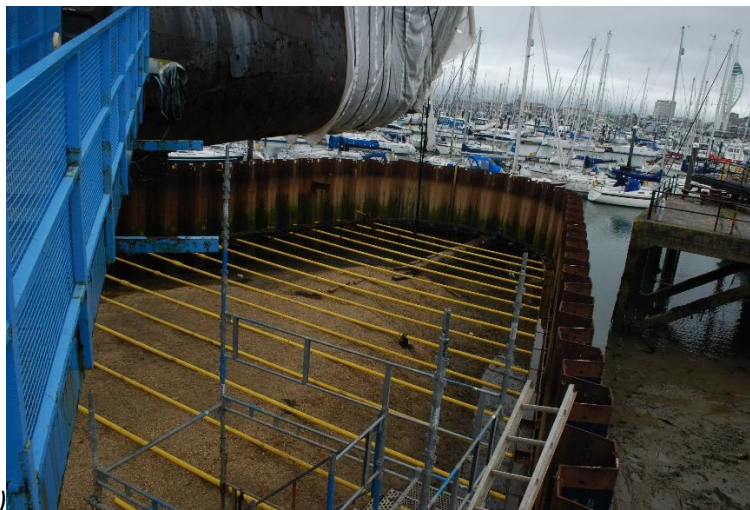
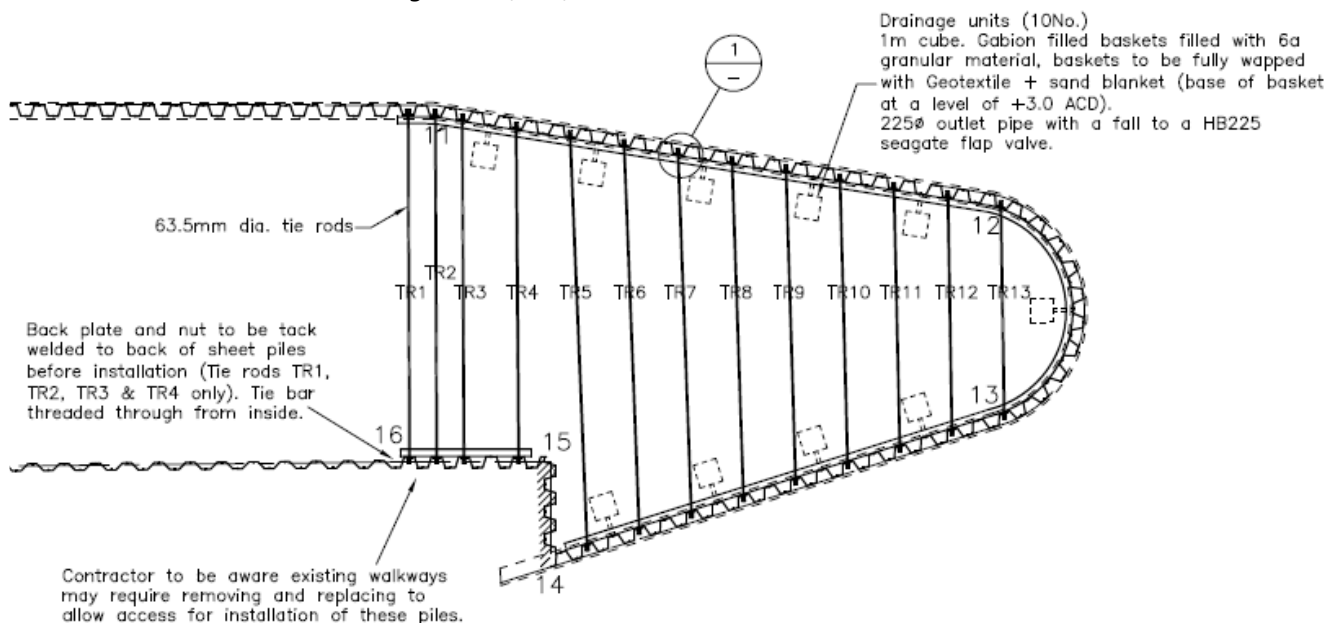


Photo during construction (pre capping beam/ drainage installation)

Bow platform detail- Extract Drg ML12-121-9.

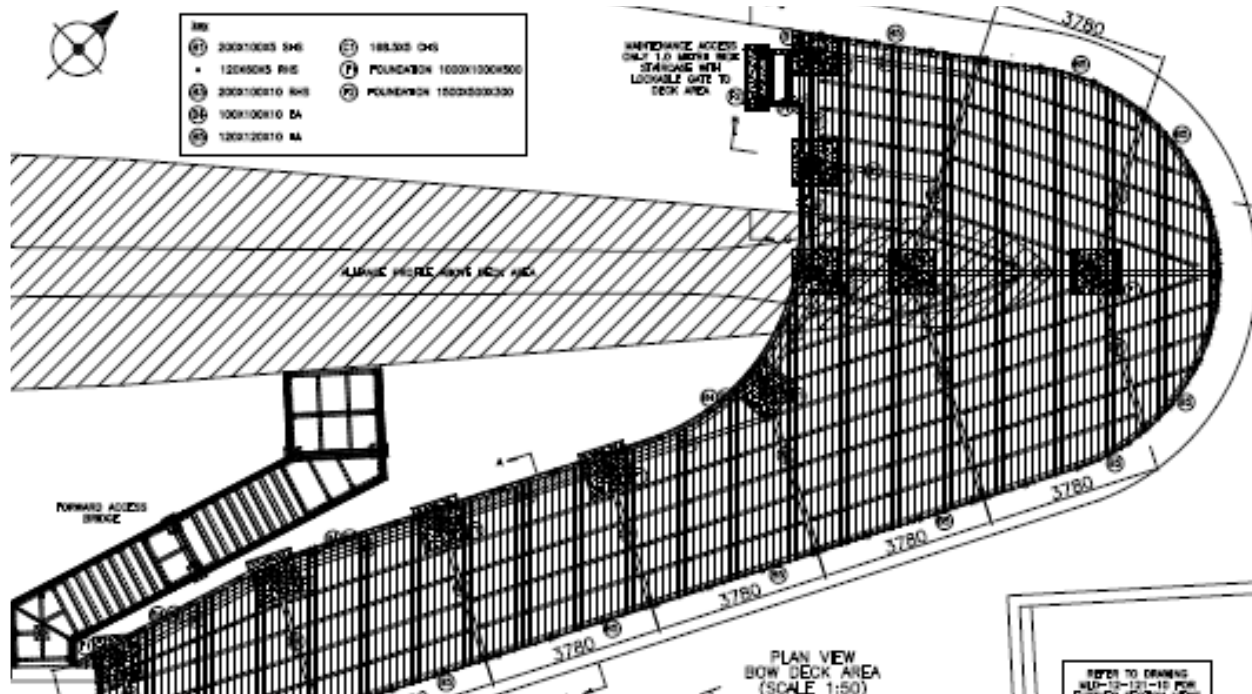


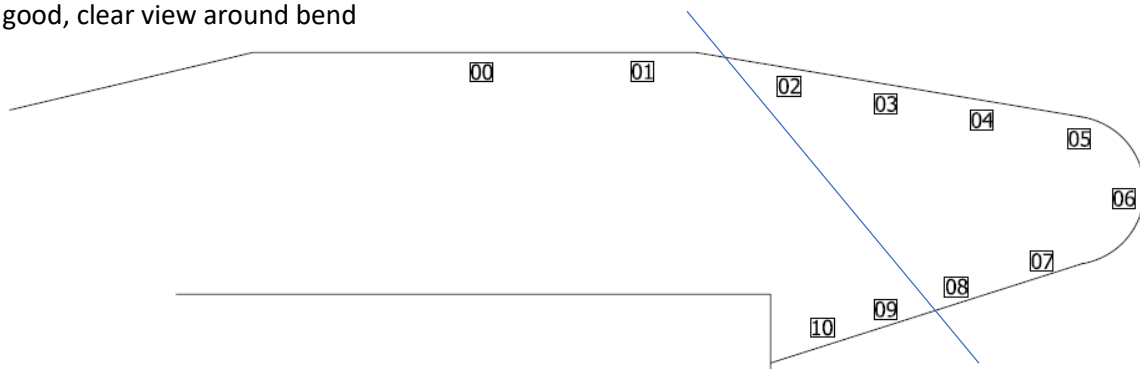
Photo of public viewing platform

Survey details

To each drainage point, a ductile 225mm flange mounted Seagate drainage flap fitted to the side flange of the external sheet piling with a connected plastic duct to give route through to installed gabion basket with 6a granular material fill with geotextile wrap and sand blanketing to give tidal waters through drainage.

Drainage Condition position-

- 00 Very good, clear view around bend
- 01 Very good, clear view around bend
- 02 Good, clear view around bend, duct a little lower
- 03 Fair, clear view around bend, duct lower
- 04 Fair, clear view around bend, duct lower
- 05 Poor, plastic duct collapsed although still attached to flap housing
- 06 Poor, stainless steel mesh fitted over opening, duct collapsed behind
- 07 Fair, clear view around bend, duct a lot lower
- 08 Good, clear view around bend, duct a little lower
- 09 Very good, clear view around bend
- 10 Very good, clear view around bend



Typical poor condition flap



Typical good condition flap

Scope of works

To enable safe excavation and temporary shoring works required for the drainage system modifications, the existing public view platform shall be carefully disassembled as necessary, set to one side, then reinstated on completion of the works to which some foundation blocks shall be removed, and new structural steel beams installed to support the reinstated viewing platform.

1. Cofferdam Drainage

To each drainage flap point marked 02, 03, 04, 05, 06, 07 & 08, Markup sketch SK01.

- 1.1. Excavate cofferdam fill to expose installed drainage gabion baskets, Seagate flap valve housing and drainage duct at approx. 2.4m ACD. Noting current fill level in main basin area is at 4.9m ACD, 4.4m ACD under observation platform and substrates are tidal.
- 1.2. Once area fully exposed to each location, remove drainage 6a fill material, duct, and gabion mesh basket frames to enable access to the rear face of the flap valve.
- 1.3. Manufacture heavy duty 316 grade stainless steel cylindrical mesh filter basket 300mm long with end plate fabricated from perforated plate with 10mm holes on 15mm pitch, with flange face to suit flap valve bolt pitch. (*See details SK02*)
- 1.4. Install new valve drainage basket to each flap valve back by disconnecting Seagate flap valve and fit additional new flanged mesh basket on back face of flap valve on existing bolt pattern along with servicing, cleaning and reinstating the flap valves.
- 1.5. Provide suitable isolation between new mesh filter basket, fixings and sheet piles, due to protectional bi-metallic corrosion between dissimilar materials.
- 1.6. Manufacture shelf header bracket from mild steel 300x75xPFC x 400mm long channel with 2x M20 bolt holes to one flange, finish hot dip galvanized.
- 1.7. Install new channel header bracket above each Seagate valve location to provide addition support from fill materials above, bolted through sheet pile pan using M20, 8.8 grade galvanized bolts.
- 1.8. Compact ground below each flap valve drainage area before reinstating modifying gabion basket to fit over/ through new drainage outlet cylindrical basket, reinstate the 6a material within gabion basket, add additional material as necessary, along with fitting new geotextile wrap and sand blanketing all round to each location.
- 1.9. Once the drainage system is reinstated, build up disturbed cofferdam substrate fill in layers, compacting regularly with excavated cofferdam fill in layers to build back up to 4.85m ACD.
- 1.10. For the final finishing layer up to 4.9m ACD, reinstate 40mm deep ground reinforcing plastic panels, add additional as necessary, final dress area with 10mm pea shingle and level.

2. Platform structure

Due to the current viewing platforms support foundations fluidity, potential movement during the cofferdam drainage works, addition support beams are to be installed in-leu of reinstating the R/C slab foundations.

- 2.1. To mark-up sketch SK01 five foundation blocks as a minimum are in the area where Cofferdam drainage works will potentially disturb the substrates and consequently the foundation blocks may/ could move.
- 2.2. Remove whole each concrete foundation block (approx. 1.0m³) as indicated on SK01 and dispose.
- 2.3. Design, manufacture and install, as indicated on SK01 new suitable structural steelwork to support the existing viewing platform to a minimum of 5kN/m² UDL.

- 2.4. The connection design of structural steelwork to the existing cofferdam wall, shall be designed so not to overload the sheet piling/ capping beam at the structural connection locations.
- 2.5. As the new support steelwork is within a tidal area, finish should be hot dip galvanized as a minimum.
- 2.6. The new structural steel beams shall under sling the existing platform steelwork, connected by the redundant foundation stool connection points to support framework above.

Note-

Throughout the works the museum shall remain open to the public and fully operational, access to HMS Alliance via the forward and aft staircases shall remain open at all times. Also, it should be noted the existing 63mm dia tie rods at 3.0m ACD shall remain fully intact and undamaged.

Supporting documents-

Drg. 16676-MR-008

Drg. ML-12-121-9

Drg. ML-12-121-10

Drg. ML-12-121-11

Drainage Flap Survey dated 22.03.2021

Mark-up SK01

Mark-up SK02