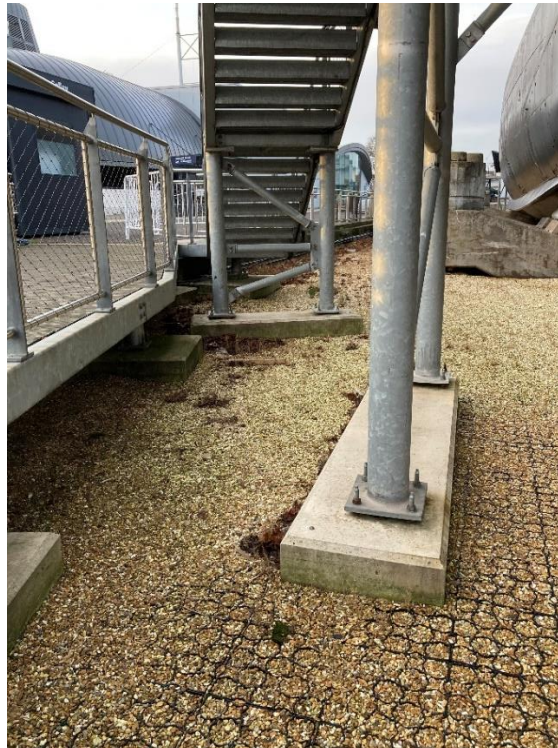


HMS Alliance, Gosport - Bow access, Cofferdam, and fill

The NMRN have concerns regarding the condition of the cofferdam fill and associated structures supported within (Bow Platform and Forward bow access staircase) site survey's where completed on 17.11.20 approx. 15:00hrs (High water 5.01m ACD at 12:24hrs) and 20.11.20 approx. 07:30hrs (low water 1.50m ACD at 07:51hrs) observations and recommendations are as follows.

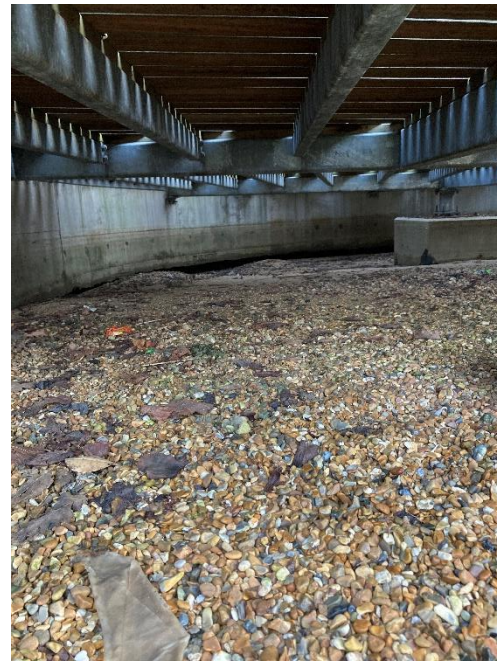
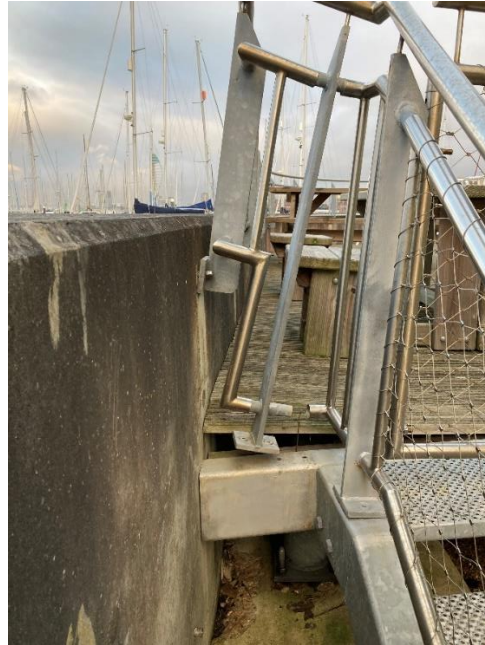
Defects and assumptions noted at time of surveys**1. Access bow staircase**

The bow access staircase is currently in contact with the boat (HMS Alliance) and it is assumed has been touching/ leaning on the hull for some-time indicating the outer most foundation pad could be inactive/ unsupportive as the foundation pad is secured/ suspended from the column base feet adding additional load/ stress to the hull contact point and staircase structure assembly itself.

**2. Bow platform structure**

The bow platform to the northern side at the maintenance entrance, has collapsed as the foundation footings below have lowered in height to which has dragged the main front platform support beam down. Where the platform frame is attached to the cofferdam ring beam, this section remains at the installation height, so subsequently the handrailing, decking adjacent is very stressed and has failed in all directions making the whole platform very unstable and not safe for public or staff usage.

HMS Alliance, Gosport - Bow access, Cofferdam, and fill



High water (17.11.20)

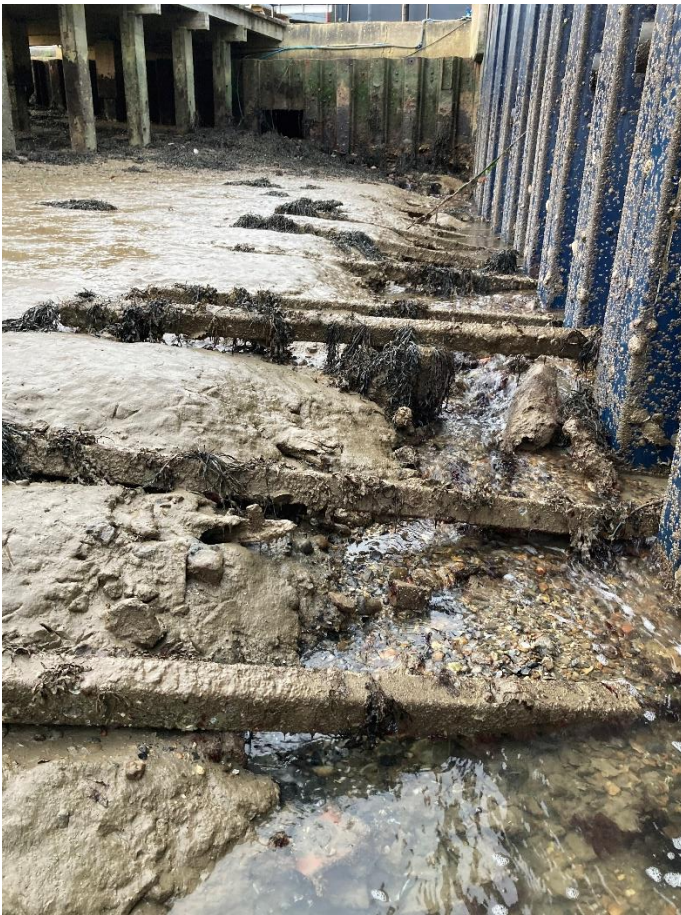
lower water (230.11.20)

It is thought the cofferdam fill area around the bow has lowered some 200/300mm whereby the granular materials have compacted through the constant ebbing and flowing of tide through its substrates. This action would have started from the outset and although it is in more recent times that the northern platform corner has collapsed it is my assumption that the surrounding supporting decking/ handrailing has been over stressed for a considerable time to which has finally given way in more recent times.

HMS Alliance, Gosport - Bow access, Cofferdam, and fill**3. Cofferdam, Sheet piling & Cathodic Protections**

The cofferdam sheet piling system has a cathodic protection system installed to which on the southern side (at low water below) you can clearly see the anodes laying on the seabed connected via earth bonding cables, to which from distance all seem fully intact.

The steel sheet piling has been installed with a good quality paint system and only minor areas of corrosion are present at some clutch joints. All through tie bar end caps seem fully intact. The main capping beam is fully intact, and no significant cracks are present other than one at the transition joint connection at the ramping end.



Anode bars

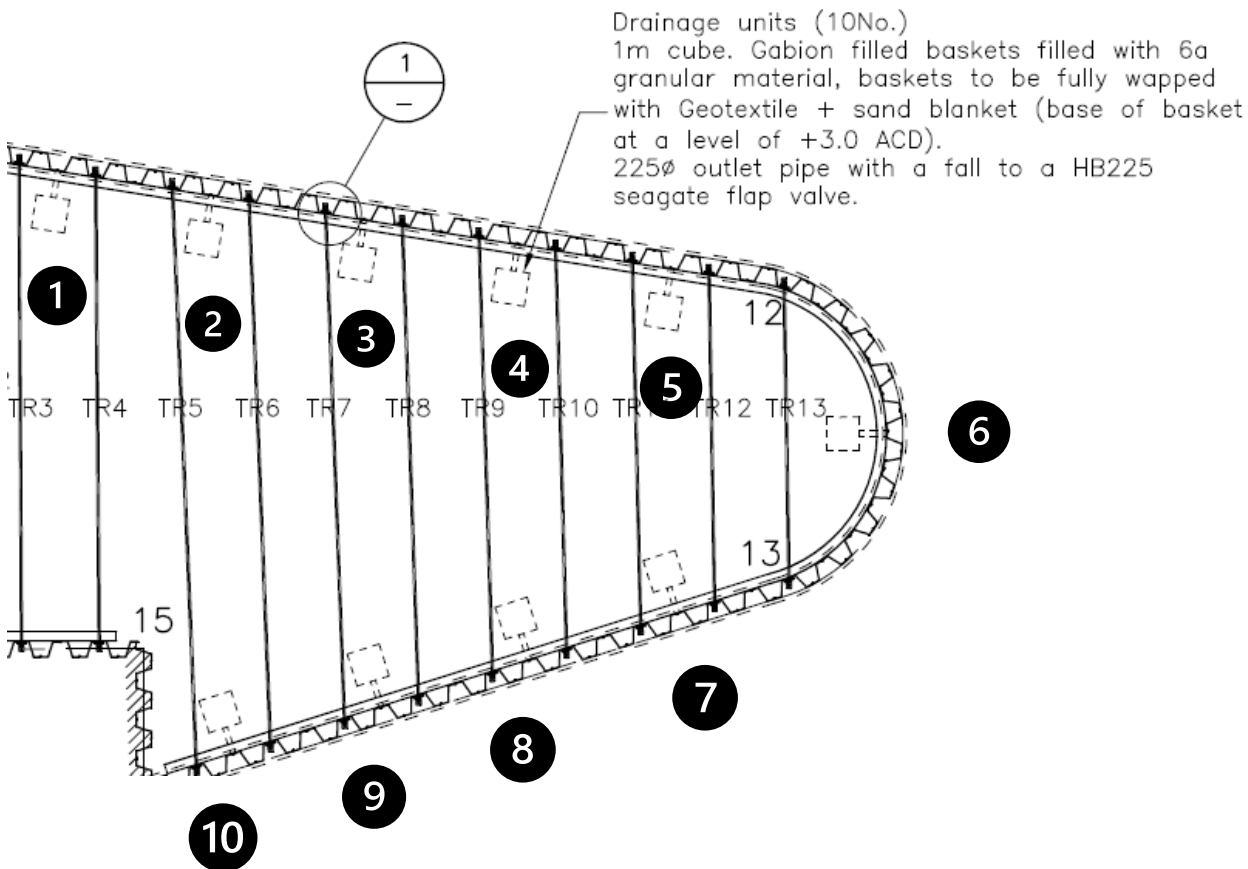


Transition joint cofferdam to ramp (crack)

The cathodic protection system is unknown on design life and if any means of testing the system have been installed. Ideally this information should be in the Builders maintenance file and copies should be sourced.

HMS Alliance, Gosport - Bow access, Cofferdam, and fill**4. Cofferdam drainage**

As part of the cofferdam installation, a series of drainage flaps have been installed to the eastern end deepest fill point to enable the drainage of the ebb and flow of tidal waters through the substrates. During the survey some were inspected on the low water survey to which drainage flaps 4, 5 & 6 are collapsing and or blocked completely. Drainage points 1, 2, 3, 7, 8, 9 although all not inspected fully due to access issues, each are assumed to be intact as flaps 3 & 7 were accessed and are fully functionable 1,2, 8, 9 & 10 lead to shallower fill areas.



Each drainage point although indicated on the Gifford preliminary drawing (extraction above from Drg. 16676/MR/008) the Build details are each drainage flap; fitted to sidewall flange of sheet pile, 225mm duct bend has been installed to give route to assumed, installed gabion 6a granular material filled baskets with geotextile wrap and sand blanketing to give through drainage as Gifford design detail.

It should also be noted, that between drainage points 3 & 5 the sea wall sheet piling collapsed during the construction and the capping beam has been casted to account for the heavily leaning sheet piling local to this area. Suggesting ground conditions locally are unstable more fluid like as well as being the deepest part of the cofferdam fill.

Conformation of the builders 'as built' details of the drainage soakaways which feed the drainage flap points should be sourced.

HMS Alliance, Gosport - Bow access, Cofferdam, and fill



Drainage point 4 (collapsing breaking away)



Drainage point 5 (collapsed and blocked)



Drainage point 6 (collapsing)



Drainage point 7 (good, drainage 3 is the same)

It should be noted no significant volumes of aggregate materials were found outside of each drainage point, only minor levels sands and gravel.

HMS Alliance, Gosport - Bow access, Cofferdam, and fill**5. Cofferdam fill**

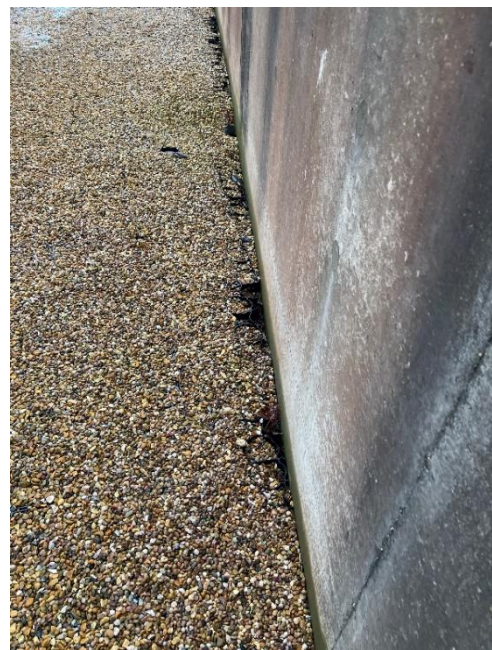
The cofferdam fill ramp area (western end) since construction has now established itself with fine granular materials so allowing growth of weeds, moss, and alike vegetation. To each of the main boat support piles (two set of four), the fill material has compacted and lowered as well as to some of the perimeter edging to the cofferdam ring beam. The fill area below the bow platform is significantly lower than the main fill by circular 500mm although this was the case (Refer to Drg. MLD 12-121-10 AB) once fill was completed. area installed at a lower area and has reduced in high some 300/400mm at the ring beam edge.



Ramp end



Compacting materials under main pile sets

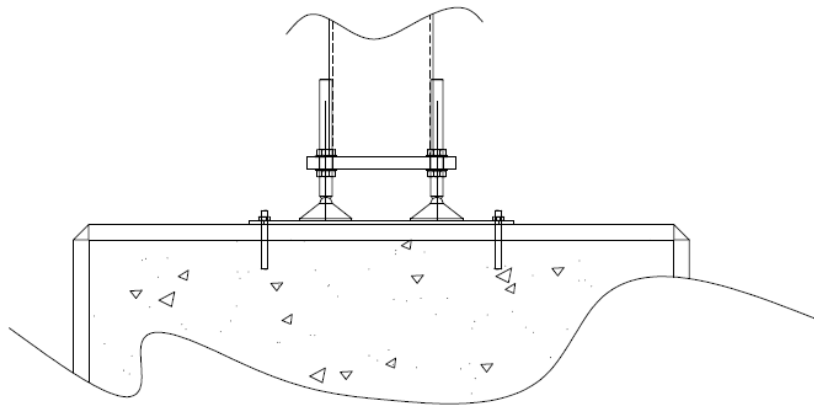


Cofferdam ring beam fill material compacting around edges

HMS Alliance, Gosport - Bow access, Cofferdam, and fill**Recommendations – Statement of Requirements (SoR)****1. Access bow staircase**

The forward staircase should be jacked of the hull using the existing stud fixing arrangements on each foundation pad and add additional steel shim plates as necessary as soon as practical. If the above is not achievable then additional measures should be actioned, i.e. Provide suitable temporary support systems to the access staircase to enable further works and continuation of use (install temporary support systems i.e. Acrow support props and clipped scaffold)

Once the staircase has been adjusted and stabilised (not in contact with HMS Alliance) remove and replace the existing stud connections with stainless steel adjustable jacking feet on the northern foundation pad (closest to Alliance), to which each column support should have a natural UHMW-PE 10mm thick plate fixed to the foundation pad to act as a bearing plate for the new adjustable stud feet to bear onto.



Typical staircase foundation pad with new type of connection/ support



Typical M20 stud fixing

Note- Future maintenance inspections should be undertaken every 12 months to ensure the access staircase is level and not in contact with HMS Alliance, adjust the base feet as necessary, record any adjustments undertaken for future record. This inspection should also include the stern access, bow deck as a matter of course.

2. Bow platform structure

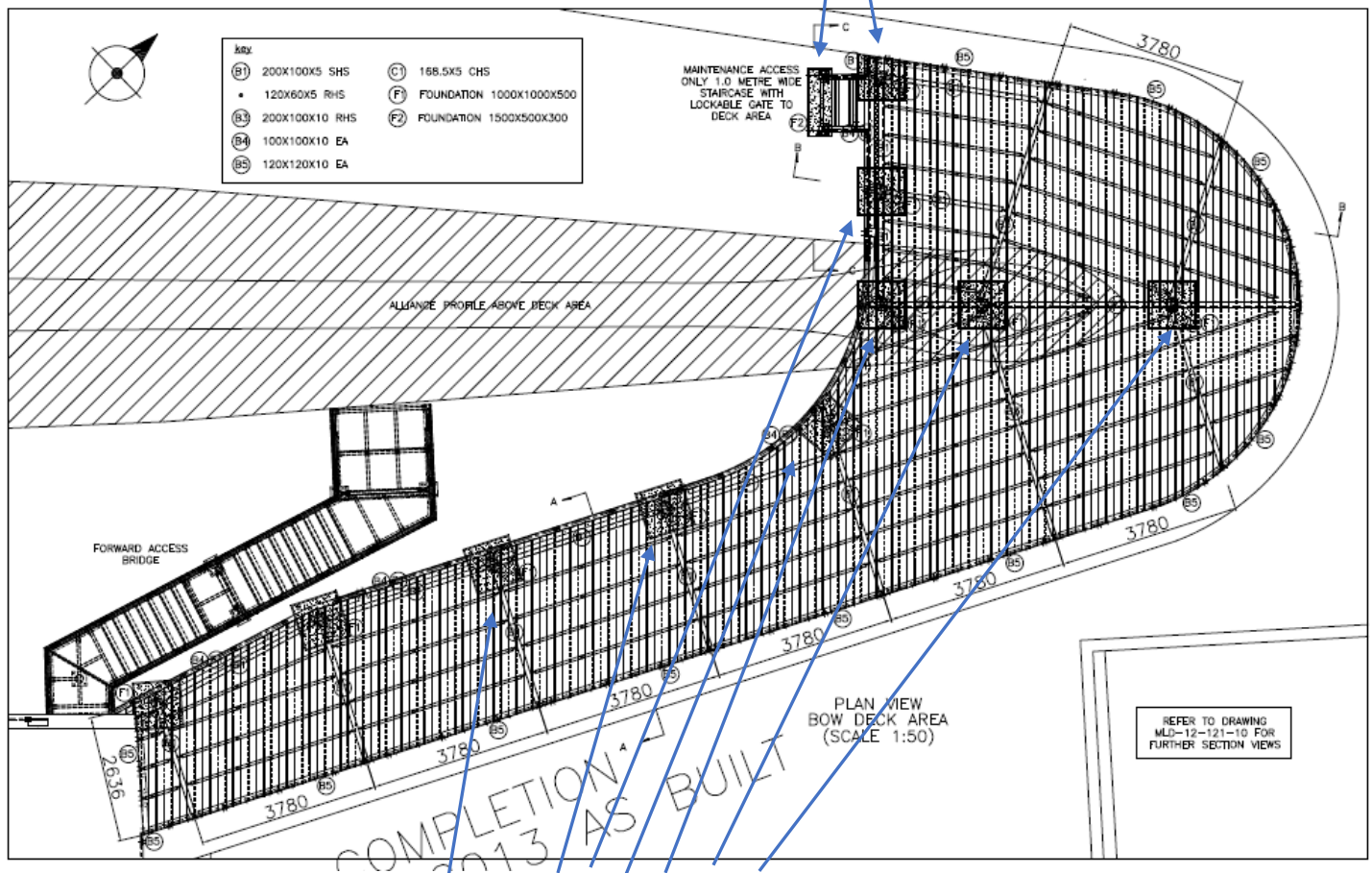
Firstly, the bow deck platform should be barriered off and closed from access in the short term for health and safety concerns. The platform structure should then be jacked up, packed, levelled, and temporarily supported as soon as practical.

To two locations, disconnect the foundation block to the base of the staircase and the foundation block closest to the sheet pile ring beam on the northern quarter (under stairs) breakout and remove concrete pads complete. Design, supply and install a new support bracket arrangement for the platform edge beam end, fixed to the cofferdam concrete ring beam. Replace to seven foundation block locations, new type stud connection fixings on natural UHMWPE plate, as per staircase column repair scheme above.

Remove as necessary and make good the stainless-steel handrails, stanchion, and gate to the northern quarter. In addition, manufacture and install an additional stair tread to compensate for the removal of the foundation block at the base of the staircase, the new tread to be as per existing type/ style, suspended at a suitable height off the existing staircase stringers.

HMS Alliance, Gosport - Bow access, Cofferdam, and fill

Remove 2x concrete blocks complete and fit new support bracket



Install 7x new type of adjustments to each foundation block

Note – For all new adjustable stainless-steel stud fixings, each should have bimetallic corrosion protection (Isolation between dissimilar materials using nylon washers or similar) and Denso tape wrapped around threads for future maintenance.

3. Cofferdam, Sheet piling & Cathodic Protections

Further survey and testing of the cathodic protection system should be undertaken once more design information is available from the 'As build' file and design life details acquired.

The concrete crack at the transition point between the main cofferdam ring beam and casted ramp wall should have a larger expansion joint between to allow movement (hence the joint has cracked, and a section has broken away). Make good with a concrete repair locally and increase the gap between the two concrete casted sections to a 15mm opening as far as access allows down to ground level, insert suitable expansion joint material (fibreboard) and seal with a suitable mastic sealant.

HMS Alliance, Gosport - Bow access, Cofferdam, and fill

4. Cofferdam drainage

Further Investigate of drainage flap number 5 should be undertaken along with clearing debris and marine growth behind flap, insert stainless steel mesh grill to prevent any further material loss from drainage point.

Carry out a further survey investigation to all drainage points not accessed originally. 1, 2, 8 , 9 & 10.

5. Cofferdam fill

To various areas of the cofferdam fill (western ramped area mainly) remove all weeds and vegetational growth, apply strong weed killer.

To the cofferdam fill areas sunken around the main support piles, under platform deck and ring beam edge, replenish the fill levels back up to 4.9m ACD & 4.4m ACD under platform deck area so in accordance with intended design levels. Fill material being a 10mm pea shingle aggregate, estimated 5 cubic metres required.

Time scales

Work tasks 1 and 2 remedial works should be completed soonest (one month) with the suggested longer-term modifications completed by Spring 2021.

Work tasks 3, 4 & 5 should be completed by the springtime 2021 and once more builder's information is available.