



Sumburgh East Runway Remedials, Shetland

Contract Value: £3,500,000
Consulting Engineer: RPS
Engineer's Representative: Sinead Henry (028 9066 7914)
Client: McLaughlin & Harvey Ltd
Client's Representative: John Mariner (028 9034 2777)
Works completed: July 2015

Categories:- Coastal Defences, Marine Civil Engineering, General Civil Engineering, Dredging.

Works Comprise:

Ashleigh Contracts secured a major Revetment project with McLaughlin & Harvey at Sumburgh Airport on Shetland which commenced in July 2013.

Ashleigh Contracts were appointed as the specialist marine contractor for this project to undertake the overlaying of the existing rock Revetment profiles and construct a new X Bloc Revetment with the detailed works to comprised:-

- Offloading and stockpiling up to 40,000T of Rock Armour imported from Norway by barge – with the armour ranging in size from 3T up to a maximum of 27T individual stone weights.
- Void infilling works to the existing Revetment which comprised the remedials to approx. 1,250m³ of voids as identified by RPS dive surveys. Works identified below -4m CD involved working with teams of divers to locate individual voids and place and infill specifically manufactured grout bags – each of which were placed into position by divers and infilled using pumped underwater concrete. Voids above -4m Cd were attended to by using heavy long reach excavators to collapse the outer face of the Revetment profile and rebuild the heavy outer armour surfaces. This combined void filling operation was required prior to the reconstruction and overlaying of the existing profile using heavy plant and equipment.
- Underwater rockbreaking of approx. 1,800m³ to form a Toe trench up to 2m deep around the perimeter of the new Revetment and to levels as deep as -12.8m CD.
- Placement of 118No 14T precast concrete X Base Units into the Toe trench and approx. 1,400No 14T X Bloc Units on the lower slopes of the new Revetment.
- Construction of a rock armoured Toe Mound to secure the base of the X Bloc Revetment by placement of 10T to 12T Armour stones out to a radius of up to 23m from the machine.
- Placement of 14T X Blocs to the final crest height of +6m CD and placement of crest armour stones in the range 18T to 27T.
- Miscellaneous site demolition and earthworks to provide for the upgrading of perimeter filling, secant piling and pilecap construction works.

All works had to be undertaken on the main live runway servicing the busy oil and gas industry on Shetland – which meant that works had to be carried out at night generally between 20:00pm and 06:30am. In addition, possession of the runway for working was further constrained by overnight air ambulance flights for which limited notice was possible and resulted in all operations having to be stood down and the runway vacated of heavy plant and equipment which could not be lowered below the runway level.

A range of specialist plant and equipment had to be deployed on this contract due to the reach and depth requirements and also due to the weights of rock armour and X Bloc revetment units. The most notable was a 130T Hitachi EX1200 excavator which was rigged for both long reach working (28m reach) to construct the lower slopes in water depths to -12m CD and in short reach heavy lift

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mode (17m reach) in order to handle the crest armour stones which weighed up to 27T individually.

In addition to the full use of Prolec PCX 3D GPS machine control on all lead-machines constructing the works, Ashleigh Contracts also deployed Echoscope 3D sonar imagery attached to the Hitachi EX1200 during the placement underwater of the 14T X Blocs. This provided the operator with live sonar imagery during placement of each Bloc to achieve best possible interlock when setting each unit on the heavy graded armour profile. An in-house developed hydraulic rotating and remote-sling release system was also used on the EX1200 in the placement of Blocs underwater to negate the use of divers as sea state and night working conditions were not safe for diving operations to be carried out safely or efficiently.



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