

Belfast Harbour, Berth VT4

HSS scour protection apron

- using concrete mattress

Consultant: Royal Haskoning
Contractor: M^cLaughlin and Harvey
2008



Proserve Ltd.

80 Priory Road,
Kenilworth,
Warwickshire, CV8 1LQ,
England

UK: 01926 512222
Int: 00 44 1926 512222
office@proserveltd.co.uk
www.proserveltd.co.uk

Fabriform



HSS Stena Voyager leaving Belfast Harbour

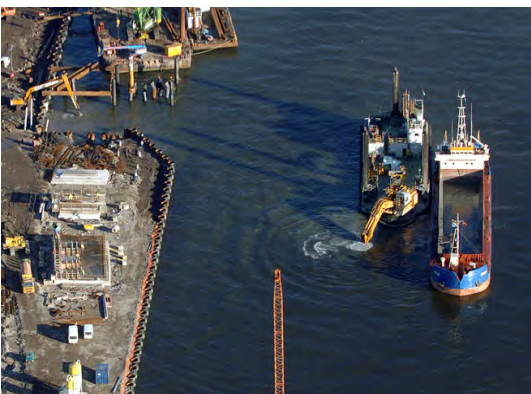
The HSS berth was moved seaward to Victoria Terminal 4 in 2008 to accommodate large HSS vessels. Significant bed protection works were required to the berth to protect the piled combi wall span height and embedment depth.

The large HSS had high velocity exit jets to 23m/s. Jet rotational movement during berthing at the Strantaer berth had created a major scour hole some 9m deep into the soft deposit bed under the unprotected area of the outer hull. The inner hull area had successfully been protected by concrete mattress.

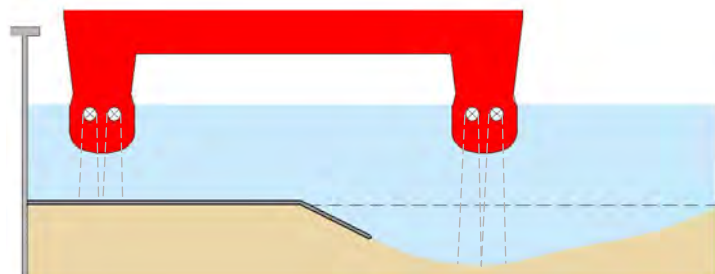
For the new Belfast berth, the area under the outer hull was also to be left unprotected. Unfortunately, the extent of the scour apron defined in the contract was in an area of significant scour potential, requiring the edge protection to be unusually deep and problematic.

The mattress thickness was designed by comparison with other successful aprons and a thickness of 350mm of constant thickness mattress was chosen. A layer of soft clay 'sleetch' at the proposed formation level was removed to allow the mattress to be founded on firmer soils to resist high jet impact pressures.

Mattress panels typically 30m long were rolled out by divers and zip connected to form 'ball and socket' shear joints. A 35N/mm² micro concrete mix was used to pump fill the mattress using a long reach boom pump. Typical installation rates were 100-130m²/day per dive team. The scour apron comprised 4,700m² of mattress.



Berth VT4 during construction



Scour profile after 1 years service