

Case Study: Bow Thruster, Wave and Current Action

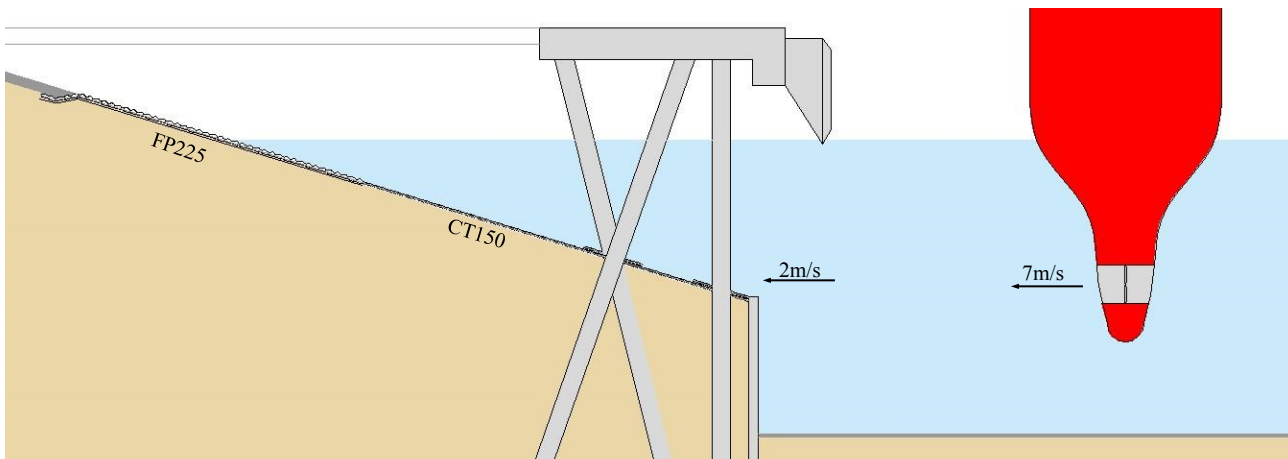
Engineer: U.R.S. Mattress Designer: Proserve Contractor: Laing O'Rourke/D.I. Installation: Kaymac 2011



Shell Jetty

The existing Shell Jetty was deepened for larger vessels and the existing revetment slopes required protection from bow thruster erosion. The working conditions were difficult with tidal currents to 1.6m/s, a design wave height of 1.1m and soil investigation showed a layer of soft silt to slopes up to 1.5m thick with an estimated settlement of 70-140mm.

A 150mm thick cast insitu concrete mattress system was designed with crack and movement control joints at 2.2m and 3m centres to accommodate settlement. An FP225 porous filter point mattress was used in the tidal range with a geotextile under layer pre-sewn to the mattresses. Lower slopes subject to bow thrusters wash were protected by CT150 mattress. Toe trenches were provided to mattress edges to protect against underscour.



Typical Section London Gateway



Mattress Filling

A site specific mattress installation was developed by Proserve and Kaymac with mattress panels custom designed and fabricated to aid rapid panel installation in diver working periods limited typically to some 1.5 hours. Internal filler sleeves within the mattress allowed rapid filling by pumping a 35N/mm² sand:cement micro concrete mix to form the insitu protection. The mattress was fabricated for installation around existing piles, with a sliding steel and mattress collar formed to cope with expected settlement. Working between vessel movements, Kaymac overcame the working conditions to complete the scour protection.