

Case Study: Jet Scour

Engineer: Atkins Mattress Designer: Proserve Contractor: Balfour Beatty 2013

CT220 concrete mattress was selected to provide scour protection to the new combi piled quay wall of the upgraded Fast Ferry Berth at Weymouth Ferry Terminal. Some 3,300 m² of mattress was installed in challenging conditions by a dive team in 6 weeks.

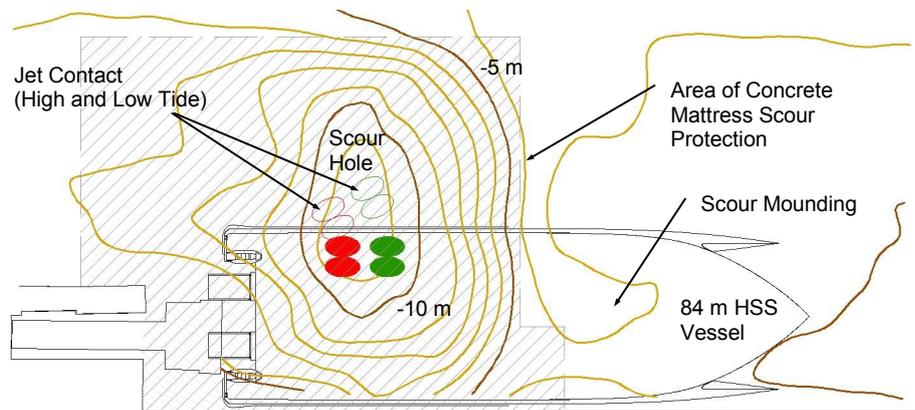
The concrete mattress provides a 220 mm thick cast insitu concrete slab on the bed of the berth, with interlocking ball and socket joints, providing highly effective protection from fast ferry jet flows of some 6.7 m/s from the Condor Vitesse and Rapide vessels operating from the berth.

Required protection thickness is significantly reduced compared to other methods, as the slab construction prevents entry of positive pressures from the high velocity jet, and the interlocking mattress panels cannot be displaced by rolling or sliding.



Weymouth Ferry Terminal

The concrete mattress was laid over an existing scour hole formed in the stiff clay bed, some 6m deep, which was partly infilled with rock to provide support to the new quay wall. The concrete mattress extent was designed to protect both outer and inner hull jet contact zones, with edge protection in the clay bed provided by a concrete bolster.

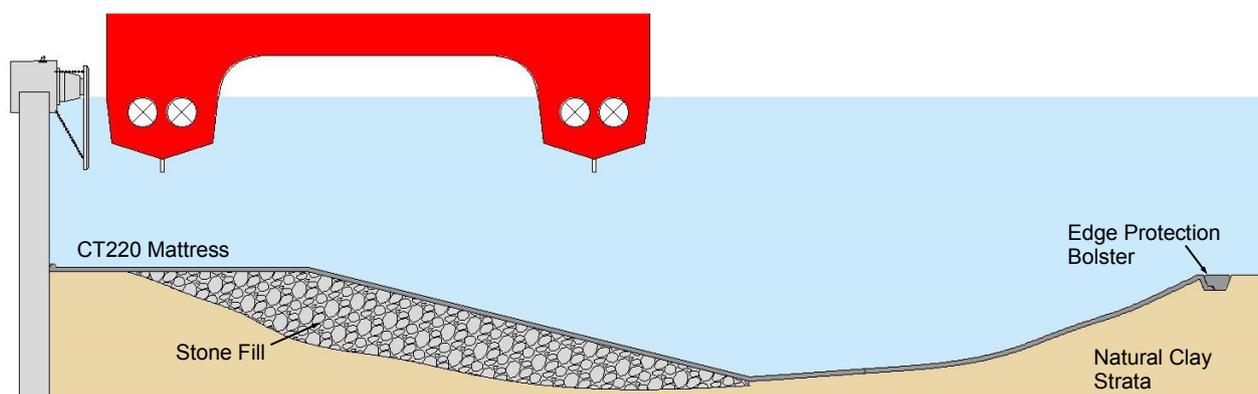


Scour Hole Extent with Designed Protection Overlaid

Proserve's Engineers designed the mattress construction system to overcome the challenges of the scour hole shape and site constraints, in agreement with the Main Contractor and Diver. Mattress panels were fabricated to suit, and Proserve provided detailed installation guidance, site visits and office based support to aid construction.

The concrete mattress system allowed the slab thickness to be accurately controlled, over locally undulating and sloping bed profiles, importantly maintaining the required berthing clearance.

Mattress panels were filled using a combination of automated layflat hose, and diver filling.



Section Through Completed CT220 Mattress Scour Protection