

PROJECT: RIVERSIDE QUAY EXTENSION PORT OF TYNE

VALUE: **£18.6M**
ROLE: **MAIN CONTRACTOR**
START DATE: **DECEMBER 2014**
COMPLETION: **MARCH 2016**

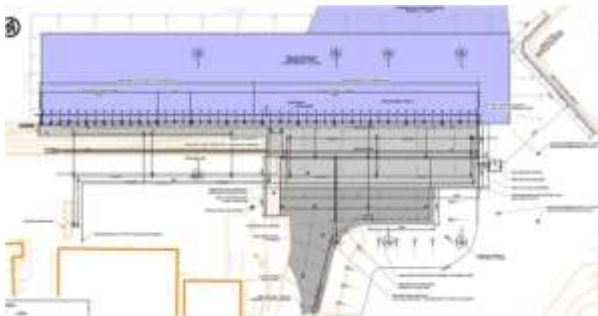
CLIENT: **PORT OF TYNE AUTHORITY**
MARITIME HOUSE
SOUTH SHIELDS
NE33 9PT

- 36m wide heavy duty piled deck
- Over 240 number tubular piles to install
- Over 100 pairs of AZ sheet piles to install
- New Quay Structure measuring over 125m
- Existing Quay Rebuild measuring over 120m
- Overall length of Quay totalling over 250m
- Existing Quay demolished and rebuilt in 9 weeks due to live Port Operations (24 hour working)

- 9,000 m3 of Insitu Structural Concrete to place
- 2,000 m3 of Precast Structural Concrete constructed on site direct by SCEL
- 125,000 tonnes of imported engineering fill delivered to site in 78 hours.
- Quayside furniture – 24 Fenders, 24 100t bollards, Dual crane rail system, Cable turnover trench (Panzerbelt), Electrical Shore pits, Water hydrants.

Southbay were awarded RSQE in November 2014 and commenced site activities in December 2014. The scheme is a design and build where Southbay appointed Royal Haskoning DHV (RHDHV) as their preferred consultants to deliver this £18.6m lump sum contract.

The basis of design was set around a demanding specification set by the Client in relation to the tie-in to the existing quay structure, position of crane unloader rails and berthing line meant the detailed design stage to be complex and even more so due to the high bedrock level throughout the scheme.



Detailed design commenced in November 2014 and complete in July 2015, the close coordination and delivery of certain design elements were paramount to ensure programme activities were unhindered and Southbay delivered each stage of works on time to their targets.

Works include to provide an additional 125m length of new berth to accommodate Panamax and Kamsarmax bulk cargo vessels, 36m wide heavy-duty piles deck to support rail mounted CSU (continuous ship unloader) complete with Fenders, bollards, quay ladders, grab chains, service pits, power, hydrants, ducts, captured drainage, lighting masts, cable trench and cover, double turnover pit, guard rails and vehicle barriers.

PLANNING & PROGRESS MAIN DECK EXTENSION

Works soon commenced to import 125,000 tonne of engineering fill to both construct the 'West Bund' and also act as the main working platform which later became instrumental to the delivery of the scheme



The 6A fill was delivered in 4 shipments where Southbay held close communication and planning with the Port to ensure no disruption was caused to the Port's activities, all deliveries were discharged in less than 78 hours whilst adhering to the robust environmental regime and conditions set by the Local Authority.

The Client required a 36m wide quay, Southbay and RHDHV detailed a 18m wide suspended quay with a large combination tube and sheet pile wall retaining the 125,000 6A material, sited in the 6A engineering fill is a 18m wide Precast Piled bearing slab.

Works soon developed to shape the West Bund and create a working platform for the 300t crawler crane to install piles to the main extension



The main piling to the deck extension was continuously, bay- by-bay (6 bays in total) installed by the 300t crawler crane, and upon completion of each bay associated Precast units placed which allowed the structural in-situ concrete deck to be constructed. The 300t crane also installed the 110m long combination tube and sheet pile retaining wall prior to the working platform (West Bund) being excavated for the associated tie bars and anchor to the retaining wall



DREDGING

The scheme involved capital dredging to the River Tyne, which included a new approach from the channel to the Quay and a 250m long pocket to the new berth of Riverside Quay. In total a volume of over 100m³ was dredged by a cutter suction dredger. A cutter suction dredger was required due to the high bedrock level throughout the site.

PILE TOP DRILLING – DRILL, DRIVE, DRILL

The level in bedrock insisted that most piles required to be lower than set refusal due to the designed dredge, this design initiative involved large diameter drilling to the bore of the pile using a pile top rig and boring some 8m to 10m below dredged level.



PRECAST CONSTRUCTION

Utilising direct skills and employees, Southbay carried out the construction of all Precast units required for the Quay Extension. To construct the Quay, this involved Beams and Planks, there were a range of varying types of both beams and planks to suit its location. All PCC units incorporated into the deck were of structural nature meaning this would reduce in-situ fixing at a later date.



PCC Beams and Planks being placed onto deck extension

MCNULTY QUAY

McNulty Quay is situated East of Riverside Quay, although the Quay is non-operations, due to the close proximity of the dredge pocket and new combination tube and sheet pile retaining wall was required. Piles averaged 32m long and were driven and drilled to -23m CD.

QUAY REBUILD

The existing quay was supported on concrete piles set into bedrock, due to the new dredge pocket works were required to demolish and rebuild the quay frontage. Works were carried out in a possession agreed with the client to minimise any disruption to the live Port activities.



CHALLENGES

- During the scheme many challenges were encountered, including:
- Environmental restrictions / conditions set by the Local Authority and MMO.
- Close coordination working in a live Port and allocated working space.
- Existing bedrock at a high level and minimum overburden making it difficult to install temporary works.
- 44 lost days in the first 6 months due to strong winds and weather conditions.
- Design and construction phase working simultaneous, careful planning and coordination for detailed design release throughout first 7 months of scheme.
- Procurement of piles from detailed design meant delivery was in late February'15
- Procurement of materials upon gaining detailed design.

PROGRAMME

The client set a demanding timescale on the scheme at 66 weeks on site construction and applicable liquidated damages thereafter. This encompassed with the possession of the rebuild dictated that part of the site and specialised activities required 24-hour working.

The scheme was not without its day to day challenges and logistical movements, however it is reported that the scheme will be complete its contracted scope of works by Christmas 2015, some 9 weeks prior to contractual completion.