



CASE STUDY

JETTY LOADING ARM CAPACITY ASSESSMENT

CLIENT: CONFIDENTIAL

LOCATION: UK

HIGHLIGHTS

- Structural assurance
- Geotechnical modelling
- Targeted strengthening

THE CHALLENGE

Arthian was commissioned to assess Jetties at Grangemouth to support replacement of marine loading arms. The objective was to confirm whether the existing reinforced concrete jetties and piled foundations could safely accommodate the new loading.

The jetties are ageing marine structures supported on deep steel tubular piles, with varying geometry and limited historical records. No recent site-specific ground investigation data was available, requiring development of geotechnical models using regional information.



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THE SOLUTION

Arthian delivered a combined structural and geotechnical assessment. Finite element models were developed in SAP2000 to analyse load transfer from the proposed loading arms into the jetty structure.

A range of loading scenarios was assessed in line with Eurocodes and maritime standards. In parallel, a ground model was developed from historical data to assess pile capacity using Oasys PILE.

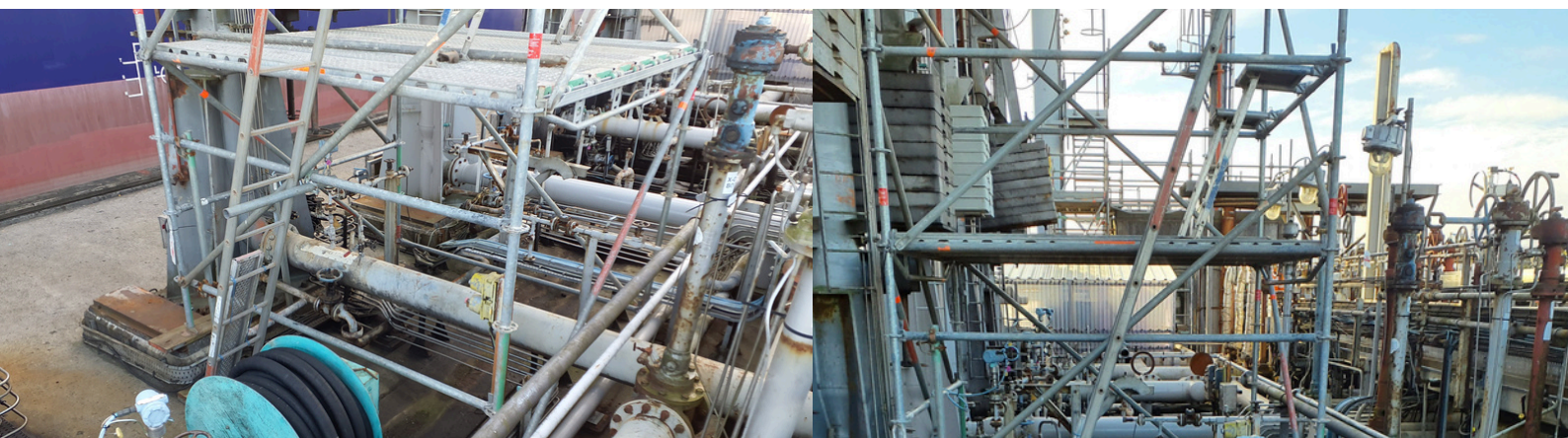
The assessment confirmed that both jetties have sufficient structural capacity for the proposed loading arms. Targeted recommendations were made to reduce risk, including strengthening of holding-down bolts at specific locations on the Jetty and further ground investigation to refine foundation performance.

Key Outcomes

- Confirmed structural capacity of both jetties
- Identified targeted strengthening requirements
- Developed geotechnical models in the absence of site data
- Recommended further ground investigation (currently underway)
- Supported safe progression of the loading arm replacement

Project Insight

A robust, evidence-led approach allowed Arthian to provide clear engineering assurance and practical recommendations despite limited ground data and complex operational constraints.



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