



# engenium

smart project delivery

## Demonstrated Capabilities

- Project management
- Mechanical engineering
- Construction management
- Feasibility studies.

## Kwinana Shiploaders Project Management and Mechanical Engineering

**Client** CBH Group

**Project Location** Kwinana, Western Australia

### Scope

Engenium was appointed by CBH Group to complete a number of different projects with regards to the shiploaders at Kwinana Port.

1. Develop concepts for optimisation of the shiploaders on the Kwinana jetty, including relocation of SL1 and removal of SL2 via heavy lift vessel.
2. Develop engineered solutions to recover shiploader SL4 from breakdown state and install new luff pivot bearings, this also included the project management of the contractor brought in to complete the works.
3. Carry out a condition assessment of shiploaders SL1 and SL2 and then develop recommended refurbishment options based on estimate of lifecycle cost.
4. Carry out market research for the complete replacement of the shiploaders.
5. Provide engineering support optimisation of shiploaders from concepts developed for SL1 and SL2 and carry out support for all contractors acting as CBH Group Engineer.

### Business Objective

CBH Group has aging assets and is continually looking to optimise product while reducing risk. The maintenance

on SL4 resulted in restoration of a critical outloading asset to production. Optimisation of the shiploaders on the wharf reduced the risk of breakdowns on SL1 and SL2 affecting the operation of the key machines SL3 and SL4. Removal of SL2 for decommissioning reduced the maintenance spend required by removing the least reliable asset.

### Challenges to Overcome

The machines were over 40 years old and design data was difficult to find or non-existent. Physical limitations on the wharf are limited space, low strength limits on the wharf deck and working over water. Environmental considerations for the luff bearing replacement and heavy lift included poor weather with high winds. These limit the available methods for maintenance and lifting. The machines handle grain which meant hygiene and potentially hazardous conditions were to be considered. Each machine weighed 740 tonnes and thus required heavy lifting equipment for any movements, but the machines were not designed to be lifted complete.

### Smarts

Engenium teamed up with FLSmidth to carry out the bearing replacement. Lifting method for optimisation required developing methodology within a very short timeframe while maintaining high standards of safety. Structural analysis to verify lifting methodology was critical to the client and was successfully carried out by using a risk based approach to identify critical loading cases and completed using analysis software.

### Project Outcome

Production levels were restored with SL4 back into production. The client also benefited from safe optimisation of the shiploaders and removal of SL2 to reduce maintenance costs.

# Delivering Value. Delivering Results.