



# engenium

smart project delivery

## Demonstrated Capabilities

- Engineering Design using SpaceGass Structural Analysis and Design Software.
- ProSteel 3D Intelligent Model of the structure was developed and from that Fabrication Drawings were produced.
- Our Design Engineers assisted in the erection sequence.
- Efficient design to enable a lower tonnage of steelwork.

## Port Navigation Aids Engineering Design and Shop Fabrication Drawings

### Client

Thomas & Coffey.

### Project Location

NCIG Coal Terminal, Port of Newcastle, New South Wales.

### Scope

Engenium's Newcastle office were asked to provide the Civil and Structural Engineering Design and Shop Fabrication Drawings for six navigation towers ranging in height from 10 metre to 38 metre. This work was part of the NCIG Coal Terminal shipping route upgrade at the Port of Newcastle.

### Business Objective

A new coal terminal was to be constructed in the Port of Newcastle, as well as new requirements for shipping control. New berths were also constructed on Kooragang Island further upstream than the Port Waratah Coal Loader berths.

### Challenges to Overcome

There were two main design requirements noted in the design criteria. Firstly, the maximum deflection under working wind load was to be limited to  $H/300$ . Secondly the natural frequency of all towers was limited to greater than 1Hz. One tower was located on the foreshore of the harbour and therefore piles had to be installed through existing geotechnical substructure.

### Smarts

Estimating wind drag on the towers was a challenge due to the significant platforms, ladders, handrails and signage located at the top of the towers. The piled footings were modelled with the towers to ensure that any footing deflection was taken into account to comply with the deflection limit. The designer assisted with the erection of the towers in designing lifting lugs and erection procedures.

### Project Outcome

The work was delivered on time and under budget. Fabrication Drawings were produced using ProSteel. Engenium went from Engineering Design directly to Fabrication Drawings. The work resulted in savings for the client.

### Want To Know More?

For more information please contact our Newcastle office on +61 (0)2 4940 4100, email [info@engenium.com.au](mailto:info@engenium.com.au), or visit our website [engenium.com.au](http://engenium.com.au).

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