



Case Study – Rehabilitation of Wrought Iron Pipe Bridge

Problem

The condition of a Victorian pipe bridge was at risk of compromising the integrity of a 30 inch water pipeline it supports. This pipeline is an important asset as it carries 25 million litres of water a day and supplies a large urban area.

The bridge is also a historical land mark and there was keen interest in the local area to see it restored.

Solution

AESL inspected, analysed, repaired and refurbished the three span wrought iron bridge of bolted and riveted construction and the 30inch diameter wrought iron riveted pipeline to restore the integrity of both the bridge and the pipeline.

The process involved:

- Bridge inspection and stress analysis.
- Replacement of pipe support members.
- Decorative iron work repairs.
- Bridge and pipeline painting.

The AESL bridge inspection revealed that 35 brackets which support the pipeline along the length of the bridge were severely corroded and some were sagging, these required replacement.

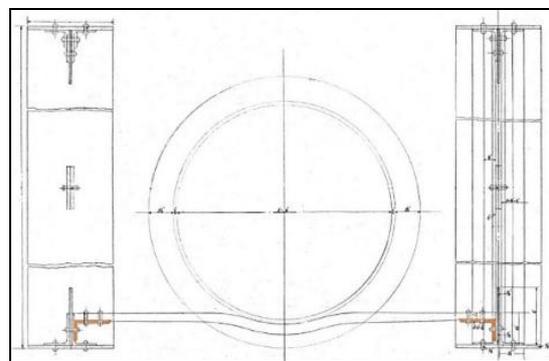


Fig 1 - Cross sectional drawing of Pipe Bridge



*Fig 2 - Corroded and sagging brackets
(35 brackets required replacement)*

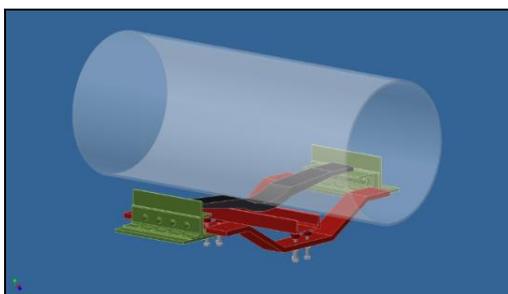


Fig 3 - Temporary support during bracket replacement

Temporary supports were designed and manufactured to allow the replacement of the brackets to take place safely and without compromising the integrity of the pipe.

AESL completed a stress analysis of the corroded pipe bridge to confirm whether the bridge structure was within the allowable stresses for the wrought iron material and whether reinforcement of the corroded sections was required.

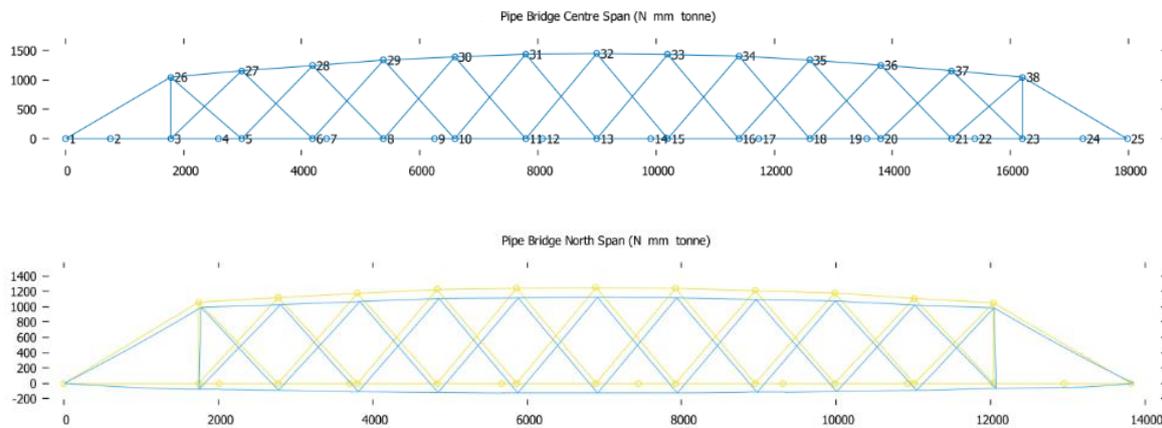


Fig4 - Stress analysis of Pipe Bridge - deflected structure (bottom diagram)

Repairs were made to secure the ornamental lattice work on the bridge. Finally AESL grid-blasted and re-painted the metal structure of the bridge and pipework.



Fig4 - Before refurbishment work

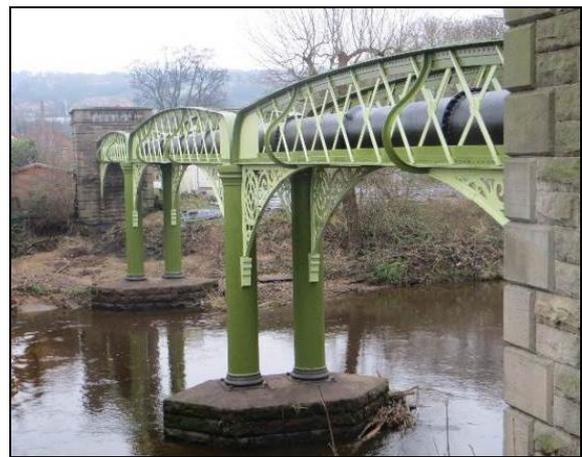


Fig 5 - After refurbishment work

Conclusion

The integrity of the pipe bridge has been maintained and security of supply to the water company's customers has been improved by the rehabilitation work.

The visible maintenance to the pipe bridge has received positive feedback from the local customers.