

Wentworth to Broken Hill Pipeline

Pipeline in NSW, Australia



Project Need

The installation of the 264km Wentworth to Broken Hill (W2BH) Pipeline was critical for Broken Hill and surrounding communities in New South Wales which had been suffering from significant water scarcity prior to the construction of the pipeline. The pipeline is a major piece of public infrastructure supplying up to 37.4 megalitres of raw water per day for the communities in regional NSW.

The need for this project was identified by the New South Wales (NSW) Government, who selected the Murray River in Wentworth as the beginning point, stretching all the way down to Broken Hill. The pipeline was stipulated to be an effective long-term solution for the drought-stricken region. The NSW Government had identified the W2BH Pipeline as the ideal solution because it would provide the most reliable long-term water supply sourced from the River Murray. The project requirement included a majority of Australian made steel.

The W2BH pipeline is a \$500 million dollar project funded by the NSW Government and represents the largest major investment in history to secure water supply for a regional town. Deputy Premier Troy Grant said this investment would **"give Broken Hill the opportunity not just to continue to exist, but to thrive"**. WaterNSW appointed a consortium of John Holland, MPC Kinetic and TRILITY to design, build, operate and maintain the W2BH Pipeline.

The pipeline was constructed underground from the River Murray on the Victorian border near Wentworth to Mica Street Water Treatment Plant in Broken Hill, with the intention to secure water for recognised demand for domestic, industrial and the urban needs of the people of Broken Hill. Majority of the buried pipeline runs adjacent to the Silver City Highway predominantly on the western side of the road - with the last 6km running under the streets of Broken Hill until terminating at the Mica Street Water Treatment Plant.

Project: Wentworth to Broken Hill Pipeline (W2BH)

Principal: WaterNSW

Location: Wentworth to Broken Hill

Completion: December 2018

Supplied: 264km of 762mm of Sintajoint Rubber Ring Joint Mild Steel Cement Lined pipe.

The pipeline required four pumping stations which were constructed along the route, as well as a 720 megalitre bulk water storage facility 25 km south of Broken Hill on Balaclava Station.

The W2BH Pipeline was the largest single pipeline order (264km) undertaken by Steel Mains within the last 30 years.

Solution

In 2014, an Options Assessment by NSW Public Works identified Steel Mains' fusion bonded, polyethylene coated, Sintakote[®] mild steel cement lined pipes as the preferred material for use in the W2BH project. The decision was based on the design flexibility, price, laying cost, product quality and service life of Steel Mains' pipes.

Steel Mains manufactured and supplied a mammoth 264km of its Sintakote cement mortar lined steel pipe in a 10-month duration which commenced in October 2017. Cathodic protection and a bitumen seal coat was applied to the full pipeline.

172km was fabricated at Steel Mains' Somerton manufacturing facility in Victoria which ramped up to double shifts for the duration of the project, with the remainder manufactured at the Kwinana facility in Western Australia. Steel Mains' flexible labour model supported efficient ramp up and ramp down in line with demand.

The complex manufacturing process included 16 different pipe configurations consisting of different steel grades, thicknesses and pipe joint end-type combinations. At its peak, more than 240 Steel Mains employees were working on the project. Steel Mains also used two local fabrication subcontractors in Wentworth and Broken Hill for specialised fabricated pipe specials. This ensured local participation and that a skills legacy was brought to communities in proximity to the pipeline's construction.

At the plants the hot rolled coils were transformed into spiral welded pipe in lengths of approximately 12 and 13.5 m, with each section weighing about 3 tonnes. A total of 20,827 straight length pipes were manufactured which equaled to almost 30,000 tonnes of steel including steel fittings. A total of 2,317 truckloads were required to transport the steel pipe and fittings to its designated locations. Manhours totaled up to 344,000 hours for steel pipes and 20,798 hours for steel pipe fittings.



Steel Mains' proprietary SINTAJOINT[®] steel rubber ring joint was specified for the W2BH pipeline. SINTAJOINT is specifically designed to eliminate the need for any on site field reinstatement after assembly on site. It also incorporates the Sintakote coating system which is continuous within the joint and its interface under the cement lining-providing the ultimate corrosion protection with a highly effective high-pressure seal.

The fast installation speed associated with Steel Mains' SINTAJOINT enabled the pipe layers to achieve a laying average of 2.5-3km per day which allowed the construction team (John Holland and MPC) to install the pipeline in seven months and scheduled completion for December 2018.

The steel pipes and fittings were manufactured under robust quality management systems in place and aligned with the appropriate Australian Standards of:

- AS 1579 - Arc Welded Steel Pipes and Fittings for Water and Waste Water
- AS/NZS 1594 - Hot-rolled Steel Flat Products
- AS 4321 - Fusion Bonded Medium Density Polyethylene Coatings and Linings for Pipes and Fittings.
- AS 1281 - Cement Mortar Lining of Steel Pipes and Fittings.
- AS 1646 - Elastomeric Seals for Waterworks Purposes.

Achievements

The W2BH pipeline was a significant regional project delivered with a record efficiency from fabrication to installation. Steel Mains' superior pipe jointing technology allowed the laying contractor to achieve an outstanding record laying rate of 7.3 kilometres of pipe in a single day. The W2BH was eventually named as one of the fastest infrastructure projects ever built in the state.



The economical benefits that were associated with this project were immediate and immense for the national economy and both the Wentworth and the Broken Hill communities. Over 150 locals contributed to the pipeline workforce which had reached a peak of over 500 workers during construction.

Broken Hill and Wentworth based companies supplied almost \$50 million in goods and services to the project and various community initiatives were carried out by the delivery team. This included sponsorship of the Broken Hill Community Volunteer Awards and fundraising for local community-run organisations.

The Sintakote Installation and Training program provided by Steel Mains greatly assisted in the successful installation of the W2BH Pipeline and provided learning opportunities to individual pipe layers on the team. This training program was specifically designed for general pipelayers, leading hands and supervisors, as well as engineering personnel in order to gain general pipeline construction and installation knowledge – all of which are aligned with the industry standards.

The \$500 million dollar project was completed on time and was commissioned in January 2019 to March 2019. The first water event was held in February 2019 in Broken Hill where NSW Deputy Premier John Barilaro acknowledged the outstanding achievements of the W2BH pipeline,

“Broken Hill’s people, its places and industries are so important to our outback history, our regional identity and the State’s economy...We started this journey to guarantee safe and secure water for Broken Hill – removing the stress from what is a basic right for any community, no matter where it is...With this critical piece of water infrastructure now in place, we have secured a future for Broken Hill for generations to come.”

CEO of WaterNSW, David Harris also noted,

“The project guarantees water security for the Broken Hill community and the social and economic benefits that come with a secure, dependable water supply... With the total workforce reaching approximately 500 workers at peak times, the spin-off benefits to local businesses was considerable. It is estimated that the local economies will benefit by up to \$50 million....The skills acquired by local subcontractors on a project of this scale will also expand those firms’ capacity to engage in largescale capital works in the future. The contractor also invested around \$3 million in training, meaning that locals who worked on this project will have transferable experience and skills for future work.”

The pipeline entered the operation and maintenance phase in April 2019 and since then has significantly improved the community’s access to adequate and accommodating water supply.

Steel Mains’ participation in the W2BH Pipeline involved 98% local content through local manufacturing by strategically mobilising both of its manufacturing plants to productively provide the required supply to the asset owner. Materials and labour were sourced domestically such as local stock, delivery design, installation training and support.

The W2BH Pipeline infrastructure is one of the many pertinent projects that Steel Mains was involved in. Steel Mains has contributed directly to enriching communities by manufacturing and supplying steel water pipes that promote prosperity, growth, and survival. By choosing Steel Mains as the primary supplier, the asset owner was able to avoid significant cost burdens associated with construction and can expect to benefit from over 100 years of pipeline operational life expectancy. Steel Mains’ century-long experience in engineering coupled with high level partnerships and connections to Australian resources were of key importance in the life-changing and empowering outcomes of the W2BH project.

The successful completion of the W2BH Pipeline demonstrates the high-level capabilities of Steel Mains and all other suppliers and contractors operating in the water industry that work hard to secure ample water supply for communities in need.