

Potts Hill Pressure Tunnel Bridge

Sydney Water's Potts Hill Reservoir and Water Pressure Tunnel have serviced Sydney since the mid 1920s. The Potts Hill Water Supply Reservoirs were an integral part of the Upper Nepean Water Supply Scheme, which was crucial to the development and growth of Sydney, from the late nineteenth century. The construction of the Reservoirs was a major achievement in hydraulic technology and associated construction methods at the time.

The complex also includes the inlet for an early twentieth-century high pressure tunnel and bridge. When it was built, the tunnel was an outstanding engineering feat and the third largest water supply tunnel in the world. Today, the lower reservoir is not used for bulk water storage, the connecting infrastructure is still an operational network asset. Due to the deterioration of metal structures at the tunnel intake tower, it was deemed necessary to replace the tower's metal roof and truss bridge that provides access to Sydney Water's operational assets. The truss bridge—like several bridges around the reservoir—is of historical significance and is, therefore, heritage listed. This necessitated an extensive approval process for the design and aesthetics of any components requiring replacement.

Process Engineering Technologies (PET) was engaged to design, fabricate and install a replacement truss bridge that not only looked similar to the existing Potts Hill bridge, but was compliant with today's design codes and standards. To help retain the bridge's original, heritage-listed appearance, the original painted bridge gate and intruder bars were salvaged and blasted, and corroded sections were repaired, prior to hot dipped galvanizing.

The Use of Hot Dip Galvanizing

The new bridge consists of two 12.3m long, 1.5m wide fully welded truss frames that were each galvanized in a single dip. Galvanized grating and handrails were also used across the access walkway. Galvanizing of the bridge was considered a superior solution, particularly compared to traditional painted coatings that had been used previously, which required a significant amount of ongoing maintenance and inspection. This was an important consideration for Sydney Water given the reservoir assets are of heritage significance and the other (non-operational) bridges around the reservoir site remain painted.

Technical and Engineering Innovation

The main challenges faced by the project team were logistics and execution, particularly how the large 12.3m long truss frames would be fabricated, transported, and galvanized. Industrial Galvanizers reviewed the project constraints during the initial concept of the project to ensure that the truss frames could be galvanized using a single dip process—this all depended on the size of the galvanizing bath at Industrial Galvanizers' premises in Girraween, Sydney.

To ensure that the 12.3m long truss frames could be galvanized using a single dip process, the stabilising members on the exterior of the truss frame (a feature designed to maintain the historical appearance of the bridge) were



removed during the galvanizing process. This required the installation of temporary cross bracing inside the frames during transportation and lifting. The stabilising members were then bolted onto the outside of the truss prior to installation, and the temporary cross bracing was removed.

Galvanizing such a large, fully welded structure meant that consideration had to be given to preparing weld joints, corners and lapped joints. Industrial Galvanizers inspected the completed fabrications at PET's workshop before they were transported to their premises in Girraween. This collaborative working relationship between the fabricator and the galvanizer ensured the smooth delivery of the project not only during the galvanizing process, but throughout the transportation and installation phases.

The existing bridge gates and security spikes (another historical feature of the bridge's appearance) were also salvaged, grit blasted and the damaged elements were repaired. It was discovered that one security spike was missing. As such, PET fabricated a replica to complete the installation. The original spikes were not welded but were a brazed fabrication. Unsure of how the low temperature of brazing would perform during the galvanizing process, a test piece was successfully galvanized prior to undertaking the remaining repairs.

Project Team

- Client: Sydney Water and Ventia Services
- Design, Fabrication and Installation: Process Engineering Technologies
- Galvanizer: Valmont Coatings
- Steel Supplier: Horans Steel