Project Spotlight: **Windsor Road Bridge**

Project Overview

- **Company**: S&L Steel
- **Project**: Sydney Metro Northwest, Transport for NSW
- **Client**: Impregilo Salini Joint Venture (ISJV)
- **Date**: November 2015 to current
- **Services Provided**: steel fabrication and surface protection, on-site installation and shop detailing.

Project Background

Sydney Metro is Australia's biggest public transport project.

Stage 1 – the $8.3 billion Sydney Metro Northwest – includes the elevated skytrain viaduct, taking Australia's first fully-automated metro railway above Sydney's North West for 4km between Bella Vista and Rouse Hill.

The skytrain will be between 10m and 13m above ground level, made up of 1,216 concrete segments and supported by 130 piers spaced approximately 39m apart.

The skytrain includes a new 270m long cable-stay bridge over Windsor Road at Rouse Hill, similar in design to Sydney's Anzac Bridge and destined to become an iconic landmark.

The bridge deck will be supported by a single plane of 32 cables in a modified fan arrangement, and two steel towers, up to 45m high.

The bridge is consistent with the overall form of the skytrain and takes a continuous curve over Windsor Road. This requires a flexible support structure, and hence the use of steel for the two towers, rather than the usual concrete—steel is much more elastic and pliable. In fact, when the two steel towers are first installed, they will not be completely straight. It will not be until the 32 cables are tensioned that the two towers will ultimately align.

Sydney Metro Northwest – formerly known as the North West Rail Link – opens in the first half of 2019.

S&L Steel's Scope

S&L Steel is engaged by the Impregilo Salini Joint Venture to fabricate two large steel towers, which support the curved bridge deck for the skytrain tracks.

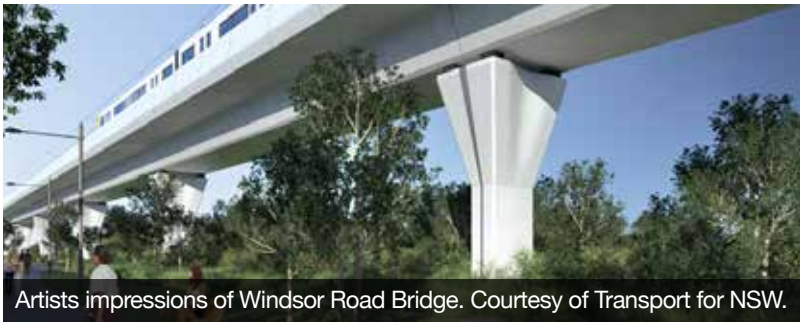
The towers are each 45m high, and approximately 6m wide. With a weight of 240 tonnes each, once the towers are complete, they will be the heaviest items that S&L Steel have had to transport.

Within these towers, there are cable anchors and guide tubes, which are 110mm thick anchorage plates aligned to a precise angle with special heavy guide tubes attached to fix the high strength cables used for suspension of the bridge deck from the towers. Freyssinet is undertaking the tensioning and cabling work.

The tower is designed using 350 grade steel for its additional strength, as well as its excellent weldability and good formability.

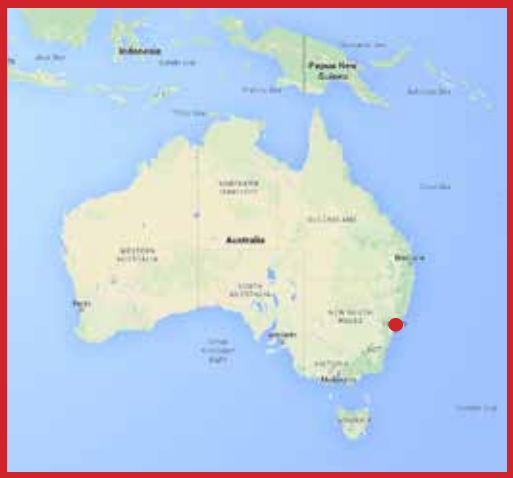
S&L Steel commenced work on the towers in November 2015, with a dedicated crew working non-stop. It is expected that the fabrication work will be completed by early May, with delivery and installation to occur almost immediately.

Founded in 1974, S&L Steel is a leader in structural steel fabrication, engineering and erection, providing expert services on some of Australia's largest infrastructure projects. S&L Steel has current WTIA certification to AS3834 (Part 2) and will receive its ISO 9000 QA certification this month. For more information, visit www.slsteel.com.au.



Artists impressions of Windsor Road Bridge. Courtesy of Transport for NSW.

Fabrication work on the two towers in S&L Steel's Sydney workshop.



About Sydney Metro Northwest

Australia's largest public transport infrastructure project, Sydney Metro Northwest (formerly North West Rail Link) will be the first fully-automated metro rail system in Australia. It is on track to open in the first half of 2019.

The project will deliver eight new railway stations and 4,000 commuter car parking spaces to Sydney's growing north-west. Trains will operate every four minutes in the peak, with at least 15 trains an hour. Sydney Metro Northwest will deliver a reliable public transport service to a region which has the highest car ownership levels per household in Australia.

There are 16 construction sites for the project, with three core zones:

- Epping to Bella Vista Station: tunnel work
- Bella Vista Station to Rouse Hill Station: embankment and skytrain
- Rouse Hill Station to Tallawong Road: surface or bridge and viaduct structures Metro Trains Facility

The project includes construction of twin 15km tunnels from Bella Vista to Epping, which, upon completion, will be Australia's longest rail tunnels.