Woronora Bridge, Sydney - Australia

A VSL package including rock anchors, post tensioning and launching.

▲ *Bridge in final position*

The Woronora Bridge, on the southern outskirts of Sydney, provides a safer and much improved road connection across the Woronora River, between the Menai growth area and the Sutherland business and transport hub.

The superstructure is 521 metres long, and carries four lanes each 3.5 metres wide. The bridge deck, weighing approximately 20,000 tonnes, was constructed using the incremental launching method.

Comprising 10 spans of 58.7 metres typical length, the bridge has both horizontal and vertical alignment curvature with a maximum downhill gradient of 5.5 %. This configuration offered considerable construction challenges from a number of aspects, but none more challenging than that of the launching operation.

Because of the steep downhill gradient and the low friction of the teflon coated rubber launching pads a braking mechanism was incorporated into the design of the launching system.

The essential elements of the launching system compromised a 500 tonnes launching jack constrained by two SLU330 bracking jacks. All jacks moved up and down 31 strand tendons which were fixed between temporary concrete anchorage blocks. The jacks were fixed to the bridge by ‘pulling sticks” passing through the top and bottom flanges of the concrete box girder. Each launched segment was approximately 30 metres in length corresponding to half the typical span length. Automation of the system allowed a single operator to control the launch from a central control panel achieving launching speed of up to 8 metres per hour.

The VSL scope of works also included the supply and installation of the post-tensioning. Approximately 250 tones of multi-strands post-tensioning was installed into the single box girder. Casting of the segment was done in two operations. The webs and the bottom flange. 50mPa concrete was used allowing stressing to take place within 12 hours of placing concrete which , in turn, was responsible for an optimum cycle time of only six day.

VSL also installed 16 permanent rock anchors in the pier and abutment foundations. These ranged in size from 8 x 15.2 mm strands in the piers to 14 x 15.2 strands in the abutments.

Scope of works performed

- Launching operation
- Supply and installation of the post-tensioning
- Installation of rock anchors

▲ *VSL SMU330 “brake” jack*

OWNER
Roads and Traffic Authority NSW

ENGINEER
Taylor & Herbert Construction Engineering Pty Ltd.

MAIN CONTRACTOR
Barclay Mowlem Construction Ltd.

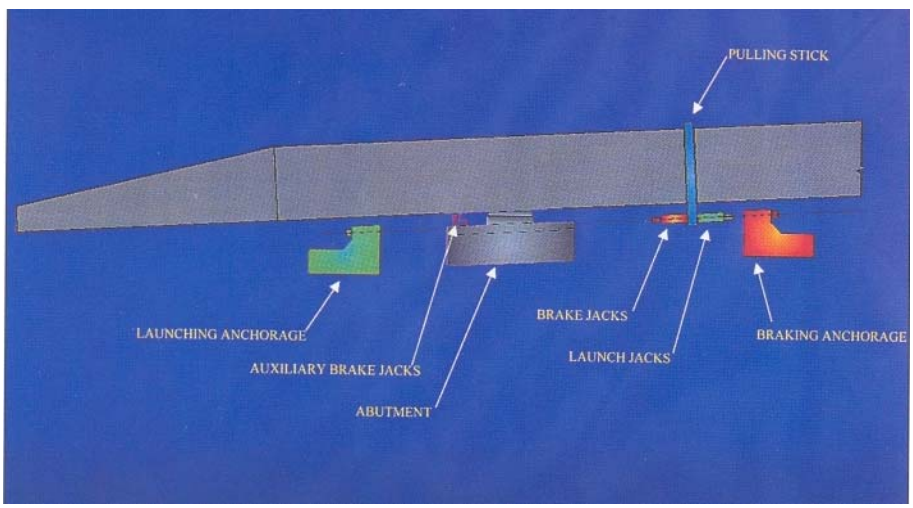
VSL ENTITY
VSL Prestressing (Aust.) Pty Ltd.

DATE
02-1999 / 12-2000

Work on the rock anchors commenced in February 1999 and the last of the post-tensioning was completed in December 2000.

▼ *Bridge during launching*

▼ *Launching and braking system arrangement*



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