

Legacy Way Cross Passages

Brisbane, Australia

BarChip Inc.

The Synthetic Fibre Experts

Project Details

Brisbane's Legacy Way tunnel is a 4.6 km long twin tube TBM driven road tunnel. Transcity, a joint venture between Brisbane-based BMD Constructions, Italian tunnelling company Ghella and Spanish tunnelling and civil infrastructure company, Acciona Infrastructures won the design and construct contract. Two 12.4 m double shielded Herrenknecht TBMs excavated the tunnel in record breaking time, achieving 30 day maximums of 787.8 m and 818.9 m respectively and total time of 6 months and 9 months for each TBM drive.

The Transcity JV won the 2013 ITA tunnelling award category Major Tunnelling Project of the Year (Over \$500M) for the Legacy Way tunnel, which is due for completion in 2015.

Design Details

The two tunnels are connected by 37 underground cross passages, spaced every 120 metres along the length of Legacy Way. Each passage is 4 metres wide, 3.5 metres high and 10 metres long. Excavation consisted of rock hammer, road header and where necessary drill and blast. Ground support comprised a temporary steel or synthetic fibre reinforced shotcrete lining, followed by

a cast in situ synthetic fibre reinforced permanent arch lining.

Following form work set-up, the permanent arch lining was poured in one 8 to 12 hour shift. The arch lining was up to 1m thick in places and solely reinforced with 4 kg/m³ of BarChip synthetic fibre reinforcement. The design specification called for a maximum crack width of 0.2 mm. FEA Analysis undertaken by BarChip and on-site in-situ trials undertaken by Transcity combined with 12 hour and 3 day beam testing showed that BarChip synthetic fibre reinforcement was able to meet the design specification.

Project Benefits

BarChip synthetic fibres are capable of meeting high performance design requirements without any of the problems normally associated with traditional steel reinforcement. BarChip fibres eliminate the need to set up steel mesh, are less damaging to equipment and are non corrosive, ensuring long term durability. BarChip fibres do not suffer embrittlement, minimise maintenance down time and are the highest performing fibre on the market at the lowest cost per joule.



Fibre reinforced temporary shotcrete



BarChip synthetic fibre reinforced cast in-situ permanent lining.

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