



ROMTECH Lattice Girder Tunnel Reinforcement System



OneSteel Reinforcing is the exclusive Australasian licensee for ROMTECH Lattice Girders. (See overleaf for details of projects).

ROMTECH Lattice Girders are manufactured in low-tolerance jigs to ensure dimensional accuracy. However, the fact that the units can be fabricated just days before being required, means last minute changes to profiles can be incorporated, and the various sections manufactured to suit the required excavation and installation sequence.

The light weight sections simplify transport and handling, and simple connection details makes them easy to install on site.

Depending on the ground conditions, they may be held in place during construction by soil or rock anchors, and are supported by standard or adjustable footplates at the invert of the tunnel.

Sprayed Concrete

A major benefit of the technology is that it offers complete encapsulation in sprayed concrete. This is the only method of tunnel lining support that forms an immediate and intimate bond with the strata and interacts actively with the excavated ground surface, instead of passively requiring the ground to move before it begins to resist that movement.

ROMTECH Lattice Girder profiles are designed to minimise shadowing during shotcreting.

In the projects detailed, the lattice girders were encapsulated using steel fibre reinforced concrete.

The steel fibre used was Dramix RC-65/35-BN, supplied by BOSFA (Bekaert OneSteel Fibres Australasia). Dramix steel fibres provide an excellent combination of toughness and crack control in shotcrete applications.

Other major Australian projects currently using Dramix steel fibres include the M5 East and the Northside Storage Tunnel in Sydney.

REINFORCING SOLUTIONS

Lattice Girders, in conjunction with shotcrete, are becoming an increasingly popular strata control method in tunnelling applications. They have been used on projects such as the Channel Tunnel Rail Link, Heathrow Airport Tunnels, and many more major European infrastructure projects.

Suitable for use in hard rock or soft ground conditions, ROMTECH Lattice Girders provide a high strength-to-weight ratio.

Developed by UK-based ROM Ltd, they are available in a wide range of sizes, and can accommodate complex radial geometries.

When used with reinforcing mesh and steel fibre-reinforced concrete, they form a continuous reinforced concrete shell, which can support both temporary and permanent loadings.



Bekaert OneSteel Fibres Australasia

Project:

South East Transit
Project, Brisbane



ROMTECH Lattice Girders reinforce South East Transit Tunnels



Queensland Transport's \$520m South East Transit Project (SETP) involved the construction of a 30km bus way and transit lane system between Brisbane CBD and the Logan Motorway. It was the first project in Australia to utilise ROMTECH Lattice Girders.

Buranda Bus Way Tunnel

90 complete ROMTECH Lattice Girder Sets were used in the construction of the 190m long tunnel in Section II of the SETP, which was built by Thiess Contractors.

Varying in width from 12.8m at the northern end to 19.2m at the southern end, construction of the tunnel was compromised by the close proximity of heavy haulage and passenger south side train lines and the nearby South East Freeway.

The rail lines were located 2.5m above the crown of the tunnel at the southern end, adding complexity to the southern portal design.

Design engineer, SMEC, specified lattice girders and steel fibre reinforced shotcrete as the primary tunnel support.

The ROMTECH Lattice Girders were manufactured locally by OneSteel Reinforcing at Acacia Ridge.

This meant lead-time was minimal and provided Thiess Contractors with the flexibility to make last minute dimensional changes as the project progressed.

The southern lattice girders were supplied in four sections with flexible foot plates, while the northern lattice girders were designed to be installed in a two-stage advance, heading and bench, utilising six lattice girder sections.

Vulture Street Y-Junction

The Vulture Street Tunnel forms part of the SETP Section I, was built by Leighton Contractors.

Peabody Resources were awarded the driven tunnel construction contract, which involved constructing a 400m long tunnel, including a complex geometrical Y-junction to allow connection at a later stage to the proposed Brisbane Light Rail.

The Y-junction is a 16m long section of tunnel on a complex curved alignment, and construction was further complicated due to the low overburden to the roadway above. Following the successful use of ROMTECH Lattice Girders on the Buranda Bus Way Tunnel, design engineer, Connell Wagner, specified them as an integral part of the overall strata control system.

OneSteel Reinforcing assisted in the design of the lattice girders to simplify installation and the lattice girders were supplied in six sections to follow the proposed tunnel advance process. The sections were installed in each of the two tunnel advances, and then in the crown section once the central pillar had been removed.

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