SIKA AT WORK
JOHNSTONE'S HILL TWIN TUNNEL
NEW ZEALAND

CONCRETE
WATERPROOFING
SEALING & BONDING
The tunnels run a total length of 640m and the tunnel design includes two cross-passages, lighting, ventilation and fire protection. The tunnels were constructed through a steep ridgeline clad with native forest. The decision to construct the tunnels option resulted in significant safety, aesthetic and environmental benefits.

The motorway had several engineering challenges including the site’s location within a steep mountainous area high in ecological value. The initial tunnel support was to be sprayed concrete incorporating steel fibres, and the shotcrete mix had to meet the specified compressive and flexural strength tests. The batching plant was approximately 30 minutes away from the tunnel site, and it was the preference of the Tunnel Engineer that the mix was not to be dosed with admixture on site.

Sika offered the following solutions for the concrete application to the tunnel:

- Sika ViscoCrete SC305 - retarding superplasticiser
- Sigunite L53-AF - accelerating sprayed concrete at the nozzle during application
- SikaTard-930 - set stabilising admixture, which controls cement hydration allowing the concrete to be sprayed 12-18 hours after batching.
- Sika also supplied a Sika Aliva PM500 Robot Sprayed Concrete machine for the shortcrete application.

Breaking through to the other side of Johnstone’s Hill

The Sika Aliva PM500 robotic arm sprays the shotcrete containing Sika ViscoCrete SC305 retarding superplasticiser, and Sigunite L53-AF accelerator for sprayed concrete.
Once the tunnel was excavated and shotcrete applied, Sika once again stepped in with a solution for waterproofing.

Sika has supplied 25,000m² of Sikaplan FPO (Flexible Polyolefin) waterproofing membrane.

This membrane was applied by Sydney based Bluey Construction Products.

The membrane was installed over a felt protection material, directly to the excavated tunnel wall or to the shotcrete (where used).
The concrete tunnel lining was then poured against the Sikaplan membrane. The concrete contained Sika ViscoCrete 5-500 a superplasticiser for an ultra smooth finish.

Sika Products used in the Northern Gateway Johnstone’s Hill Twin Tunnel Project:

**GROUTING**
- Sika Grout-212, -215
- Sika Grout-212 HP
- Sika Grout GP
- Sikadur-31
- Sikadur-41
- Sikadur-42

**CONCRETE REPAIRS**
- MonoTop Primer
- MonoTop Structural Mortar
- MonoTop High Build Mortar
- MonoTop Micro Concrete
- Renderoc LA 55
- Renderoc FC
- Nitoprimel Zinchrich
- NitoKit LV
- NitoKit TH

**WATERPROOFING**
- SikaProof Torch-on 3P & 4P Mineral
- Sikaplan FPO

**JOINT SEALANTS**
- Silaflex MS
- Sika Firerate
- Sika Firerate PU
- Plastiseal
- Sika Boom
- Sikaflex Construction
- Sikaflex-11FC
- Sikaflex Tank

**ADMIXTURES**
- Sika ViscoCrete 5-500
- Sika ViscoCrete SC 305
- Formol
- Rugasol MH & Rugasol MH extra
- SikaFilm
- Separol WB-230
- Sigunit L53- AF
- SikaTard-930

**ARCHITECTURES**
- Sika Blockbase
WHO WE ARE
Sika AG, Switzerland, is a globally active specialty chemicals company. Sika supplies the building and construction industry as well as manufacturing industries (automotive, bus, truck, rail, solar and wind power plants, façades). Sika is a leader in processing materials used in sealing, bonding, damping, reinforcing and protecting loadbearing structures. Sika’s product lines feature highquality concrete admixtures, specialty mortars, sealants and adhesives, damping and reinforcing materials, structural strengthening systems, industrial flooring as well as roofing and waterproofing systems.