



INVESTIGATION

Our roads professionals are globally networked to provide a range of investigative services to achieve the transportation goals of our clients. Our people combine technical skill and experience to evaluate how best to deliver road projects by analysing options and risks as well as geological and geotechnical issues.

OUR CAPABILITIES

GHD's related investigation services for roads include:

- ▶ Geotechnical analysis
- ▶ Surveys
- ▶ Estimates
- ▶ Option analysis
- ▶ Geological analysis
- ▶ Risk Analysis
- ▶ Foundations
- ▶ Contract documentation and tender evaluation

OUR EXPERIENCE

RECONSTRUCTION, WIDENING AND SLOPE STABILISATION, AUSTRALIA

The project involves the concept and detail design for a reconstruction and widening of a section of highway in New South Wales.

The cut slopes above the road at each bluff are steep and carry a high risk of rockfall. GHD was engaged to conduct preliminary assessment of the slopes and proposed concept options for treatment plus concepts for widening the road at each location.

Detailed design is being carried out in parallel with an extensive geotechnical investigation of the slope below the road, which has experienced a series of slips in the past. The geotechnical investigation includes geological mapping, georadar investigation and borehole drilling.

CENTENARY HIGHWAY EXTENSION, AUSTRALIA

GHD has been engaged for a number of projects on the Centenary Highway to the South of the railway at Wacol near Brisbane.

One of the projects we delivered was the planning for the Camira Bypass that would traverse the southwest districts of Brisbane and adjoining Ipswich City, where two major master planned communities were underway at Forest Lake and Springfield. The corridor connects to the existing transport links of the Centenary Highway and Ipswich Motorway at Darra and traverses through 5 kilometres of urban development and about 10 kilometres of Greenfield holdings, including a Department of Defence firing range.

The project investigated the impacts on the local hydrology and drainage regimes, flora and fauna and potential habitat areas, air quality, the acoustic environment, groundwater quality, archaeology and heritage items, existing infrastructure services, existing and potential land use, the landscape, social interaction and land values. Extensive community consultation was also undertaken including newsletters, public displays and workshops with community groups and individuals.

LAWRENCE HARGRAVE DRIVE, AUSTRALIA

The winding Sea Cliff Bridge is located in New South Wales and links the coastal towns of Coalcliff and Clifton. It comprises two lanes of traffic, a cycle way and a walkway, and boasts spectacular views of the picturesque Lawrence Hargrave Drive.

The bridge replaced a section of Lawrence Hargrave Drive that was previously closed due to regular rock falls. The 665-metre long Sea Cliff Bridge is an engineering landmark and GHD contributed the geotechnical and landslide investigations to this iconic project.

SORELL CAUSEWAY BRIDGE, AUSTRALIA

The 460-metre long replacement of the Sorell Causeway, east of Hobart in Tasmania, is one of the only match-cast, precast-segmental channel road bridges that has been built outside of Europe or the United States.

It was built to the south of the original bridge, which was demolished once the new bridge had been completed.

GHD proposed the channel concept as an alternative design and completed detailed design after the contract was awarded. Our multidisciplinary team also delivered the geotechnical analysis for the bridge.

The unique cross section of the bridge is efficient and has many advantages compared to the conventional designs. The design includes extensive use of precast technology to help achieve the durability requirements and to improve the constructability of the bridge. The specified serviceable life of concrete elements was 100 years and a maximum crack width of 0.2 millimetres was specified. Careful consideration of concrete mix, work methods, and structural design was made to accommodate these requirements, including the use of precast formwork shells. The longitudinal stiffness and strength of the bridge is obtained by significantly proportioned parapets, while the roadway slab spans between opposing parapets essentially as a one-way slab. The parapets resist crash loading as well as providing longitudinal strength. However, they are non-redundant and were designed to resist vehicular impact loads elastically.

