

Construction of the Tauranga Eastern Link

Introduction

The Western bay of plenty has experienced significant population growth in recent years which is expected to continue over the next 30 years. The key drivers of this growth will be the increasing use of New Zealand's largest port, the Port of Tauranga, and the development of new commercial, residential and industrial land to the east of the city.

The current route through Te Puke is State Highway 2 and is considered the second worst state highway under the New Zealand Road Safety Assessment Programme, based on fatalities and serious ongoing crashes per kilometer. SH2 carries 18,000 vehicles per day, 2000 of which are trucks requiring access to the port in a timely manner. Construction of the Tauranga Eastern Link (TEL) will reduce the travelling time to and from the port and provide a more reliable and consistent route for those in logistics to plan their journeys. For these reasons the TEL is considered a Road of National Significance.

TEL Scope

The TEL is a design and construct project with a construction value of \$300 million. It consists of 23km of 4 lane motorway from Te Maunga to Paengaroa, bypassing Te Puke. Due to the projects size and complexity, it was divided into three construction zones managed independently by the respective zone. Each of the three zones has varying ground conditions requiring significant geotechnical assessment and monitoring, resulting in a range of ground improvement treatments.

Construction of the TEL commenced in 2011 with a forecast completion of mid 2015. The 5 year project duration is due to a large portion of the TEL constructed over peat (a highly compressible material). To mitigate the effects of ongoing settlement, preloading of this ground was required for durations ranging between 3 and 18 months.

A combination of imported pumice sands, tephra cut to fill and on-site sand cut to fill to complete the 3 million cubic metres of earthworks. In addition to the earthworks, 550,000 square metres of pavement construction, 9400 lineal metres of drainage, 8 bridges, 4 mowing boat culverts and 1 stock underpass are required to complete the works.

Domain Interchange

The centre piece of the TEL is the Domain Interchange consisting of two bridges and three embankments built from 40,000 cubic metres of polystyrene, spanning 490m. The on-ramps and off-ramps connect to various local roads with two roundabouts managing traffic to and from Te Puke and Papamoa.

The ground conditions surrounding this interchange are some of the worst on the project. Therefore, a number of ground improvements were required prior to construction of the embankments and bridges.

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These included sand fills up to 8m deep with wick drains to accelerate settlement, high strength geotextiles and geogrids and light weight fill to construct the embankments.

Opportunities were identified at the design stage to modify the layout of the interchange from the specimen design due to the location of an existing substation. This resulted in the inclusion of three polystyrene embankments.

Construction challenges

As with most construction projects, there are several challenges that must be overcome to produce and deliver a successful project. The major impacts on construction of the TEL were:

- Managing dust to minimise the environmental impacts on surrounding properties. A large number of watercarts were required to control the dust risk across the 23km site.
- Due to the topography of the site, construction is regularly hindered by rain events causing severe flooding.
- Large sections of the project consisted of soft silts and peat deposits. Robust haul roads were required to undertake works and support the heavy machinery from becoming stuck.
- One third of the alignment follows the current State Highway. This raised the issue of managing high volumes of traffic on a daily basis and staging works to accommodate this traffic.
- Due to the length of the projects there are numerous stakeholders impacted by the project. Ongoing support and consideration is required to minimise the distress to these people and businesses.
- Programming the earthworks on the project with the uncertainty of settlement durations was a huge project challenge to minimise the quantity of imported fill and maximise efficient mass hauls.

With these challenges aside, the construction of the Tauranga Eastern Link has so far been a success in the eyes of the client and contractor and is due to be delivered 6 months ahead of its initial programmed completion date.