SH4 REALIGNMENT
OKURA (BETWEEN WANGANUI AND RAETIHI)

GREEN TERRAMESH BRIDGE ABUTMENT—15.7m (max height)

**Product:** Green Terramesh Units, Tensar RE Geogrid, Miragrid GX Geogrid

**Problem**

Two abutment walls needed to be constructed to protect the bridge piers and support the embankment fills behind the bridge abutment forming the new realignment for SH4. This new bridge alignment spans across Mangawhero River linking between Wanganui and Raetihi.

**Solution**

The Green Terramesh reinforced soil structure was considered and was the final choice for the bridge abutment wall. The versatility of geogrid reinforcement when laid around the two existing bridge piers, allowed the structure to be constructed quickly and concurrent with the backfilling process. The alternative option was a conventional concrete retaining wall, which proved to be too costly and impractical to construct. In addition, some geogrid wrap around structure was constructed behind the existing piers to relief the lateral soil thrust on the bridge piers. This was essential especially for a very tall structure.

MacStars software was used to analyse the Green Terramesh bridge abutment structure for both static and seismic cases. Full PGA horizontal load was applied in the design and analysis of the structure since it was associated with a bridge abutment, i.e. structure movement or deformation shall be restricted during an earthquake event. This required a base geogrid reinforcement length of 16m. The design also considered a rapid draw down case for a 100 year flood event on the static case.

The contractor completed the structure for the Southern Abutment (330m²) and for the Northern Abutment (600m²) expediently and was very pleased with the final outcome.

**Client name:** NZTA

**Main contractor name:** CONCRETE STRUCTURES (NZ) LTD

**Engineer’s name:** GWH NEW ZEALAND LTD

**Products used:** GREEN TERRAMESH UNITS, TENSAR RE, MIRAGRID GX

**Construction date:** MID FEB - END APRIL 2009