

## UNIVERSAL DRIVE EXTENSION - STAGE 1 & 2 HENDERSON, WAITAKERE CITY

### PAVEMENT REINFORCEMENT

**Product:** Tensar SS Geogrid, Tensar TriAx Geogrid, Bidim Geotextiles

#### STAGE 1

##### **Problem**

The original design of the pavement was based on a subgrade CBR strength of 2%. During construction the contractor encountered a section of road having very soft clayey material with high ground water table. The CBR value was estimated to be <1.0%. Concerns were raised over the performance of the road in the long term against the initial design.

##### **Solution**

Tensar SS biaxial geogrids were proposed to improve performance based on over 10 years of historic use in road applications over soft ground by local Councils and Transit NZ .

The final pavement layout was to use Bidim A29 geotextile as a separator layer between the soft subgrade and 400mm thick sand layer. The high flow rate of Bidim non woven geotextiles ensured dissipation of water pressures resulting from compaction of fill over ground with a high water table thus preventing a "water bed" effect that can occur if a geotextile with poor flow characteristics is used i.e. woven tape.

Tensar SS30 geogrid was placed between the 400mm thick sand layer and a 400mm thick GAP65 sub-base course layer followed by 150mm TNZ 40. Tensar SS30 geogrids, besides increasing the design traffic also help to minimise the effects of potential differential settlements when constructing over ground with variable subgrade strengths.

TensarPave software demonstrated that the inclusion of Tensar SS30 geogrid increased the design traffic by a factor of 4 when using the same pavement thickness.

Benkleman Beam testing of the sub-base course layer achieved design deflections of less than 2.0mm. The performance of the initial Tensar reinforced section resulted in the client doubling the area of reinforced pavement for this project.

Client / consultant name:

WAITAKERE CITY COUNCIL

Main contractor name:

HEB SMITHBRIDGE LTD

Product used:

TENSAR SS30, TENSAR TX160, BIDIM A29

Construction date:

OCTOBER 2007 - OCTOBER 2008



Soft Subgrade

Date: October 2007



Laying Tensar geogrid

Date: October 2007



Placement of GAP 65 sub-base course

Date: October 2007

## STAGE 2

Following the success of the road construction of Stage 1, over soft ground using Tensar SS geogrid; the contractor together with the Council's engineer, had no hesitation in using Tensar geogrid for the stabilisation of Stage 2 of the road. The only difference was the use of the newly launched TriAx geogrid, which provides better performance, when compared with conventional biaxial geogrids.

Tensar TriAx geogrid provides better interlocking with the granular material and hence improves performance when compared to Tensar SS geogrid, whilst the cost per metre remained the same. The Waitakere City Council has had no hesitation in using this innovative new Tensar TriAx geogrid.



Laying of Tensar geogrid

Date: October 2008



Granular fill on top of the grid

Date: October 2008



Completed road

Date: August 2009

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