



**CASE STUDY:**

# **HERD HOUSE**

## **Riverside Road**

**INCH BALCLUTHA, NEW ZEALAND**

**MARCH 2017**

**CLIENT: PEGGIE BUILDING**

**CONTRACTOR: PEGGIE BUILDING**

**DESIGNER: CALIBRE CONSULTING**

## **TENSAR TRIAX GEOGRIDS**

The Tensar TriAx geogrid is the most advanced geogrid in today's market and the result of 30 years continual innovation and development. It outperforms conventional biaxial geogrids and substantially reduces construction time and costs.

The Tensar TriAx geogrid is based on one of the most efficient, stable structural forms – the triangle. Where biaxial geogrids have inbuilt strength in two directions, with the TriAx it's multi-directional, providing greater stability and increasing bearing capacity.

Tensar TriAx geogrid with its improved rib geometry and junction efficiency, greatly improves aggregate interlock and confinement – leading to improved structural performance of the mechanically stabilised layer. Tests included trafficking trials at the University of Nottingham and, on at full scale, at the Transport Research Laboratory (TRL), the Building Research Association (BRE), as well as in-house at Tensar's own Technology Centre prove the performance improvement Tensar TriAx geogrid offers when compared with the conventional biaxial geogrid. This work was augmented by field trials and demonstrations to be assured of the real performance benefits.

**GEOFABRICS®**  
Smarter Infrastructure

Foundation settlement compromised a recently built cattle herd house on a dairy farm located at Inch Clutha. This site being a large, flat island sitting in the delta between the Matau (northern) and Koau (southern) branches of the Clutha River downstream from the town of Balclutha in the South Island of New Zealand.

Dairy farms in the Inch Clutha area have developed on 2 m deep river sediments placed there during the 1878 floods, estimated by hydrologists to have been a once in two thousand year event.

<https://www.nzgeo.com/stories/the-river-wild/>

The soil type at this site comprises Koau deep silt loam with a CBR of 1 or less on gently undulating terrain and is poorly drained in its natural state.

These are less than ideal foundation conditions for an in-ground cattle herd house with ground water level sitting at an estimated 150 mm below the base of the concrete slab.

Calibre Consulting proposed a foundation remediation plan to minimise future settlement of the structure based on findings in the report from Adams Geotechnical Ltd. Working with the Geofabrics Technical Team part of the design solution included a combination of bidim A29 non-woven geotextile and Tensar TriAx TX190L geogrid. TX190L large aperture geogrid was selected for its interlock performance properties with AP100 aggregate cover materials.

With this design, contractors Peggie Builders were able to work within the confines of the existing walls and roof negating the need to remove the entire structure and extend the raft a metre beyond the exiting footprint.

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### Installation Procedure

1. Remove concrete in 15 m sections and excavate 500 mm below concrete, per design. Be careful to not over-excavate or excessively disturb the subgrade.
2. Place bidim geotextile in 4 rollouts. Sew at the seams due to soft ground conditions. Use Double Stich J-Seam. Sew before placing (recommended) or carefully after placing so as not to disturb the subgrade. Place bidim up the sides of the excavation to fully protect all backfill from fines infiltration.
3. Spread bedding layer over geotextile, keeping equipment off bidim. Static roll only, if required.
4. Place geogrid flat and smooth in 3 rollouts with 1m minimum lap, keeping equipment off geogrid. No need to place up the sides.
5. Place backfill on all edges to hold geogrid in place while backfilling remainder of the layer, as designed. Static roll.
6. Place second layer of geogrid and backfill. Minimum 600 mm lap required in geogrid. Vibratory roller permitted on backfill this layer and above.



#### Ready for the next layer

The bedding layer is spread over the bidim.



#### Capping blocks

Backfill is laid on top of the Tensar TriAx geogrid layer.