

# technical memorandum



NZ TRANSPORT AGENCY  
WAKA KOTAHI

road safety hardware series

## Road Safety Barrier – Ground Beam

TM-2012

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### Purpose

To advise on the recommended practice for the design and installation of a ground beam for the support of semi-rigid road safety barrier systems. NOTE: this design applies to public domain systems only. For equivalent details for proprietary barrier systems, contact the system supplier.

### Background

A semi-rigid barrier system consisting of W-Beam or Thrie-beam guardrail supported on timber or steel posts requires continuity in longitudinal stiffness. This is generally achieved through the standard set-out and hardware, including post spacing and embedment. On occasion the required post spacing or embedment length may not be possible due to either the presence of underground services or the lack of a stable soil embankment behind the barrier. In those cases where the problem cannot be addressed through nesting (refer Technical Memorandum TM-2003) and leaving out one or two posts, the best solution is to construct a ground beam installation and use bridge guardrail posts.

A ground beam and bridge posts using 2.7mm highway guardrail (refer NZTA Standard Drawings B1 and B2) is considered to be equivalent to the driven strong post timber system using highway guardrail. A ground beam and Thrie-beam bridge posts using Thrie-beam guardrail (refer NZTA Standard Drawings B3 and B4) is considered equivalent to Thrie-beam bridge posts on individual concrete footings of 600mm diameter and 1000mm deep.

The lack of a standard detail for the design and installation of a ground beam has resulted in significant variation in construction practice and project cost. A standard detail providing dimensions and reinforcement details is now provided in Figure 1. This detail applies for semi-rigid barrier systems (W-Beam or Thrie-beam) supported on steel posts (refer NZTA Standard Drawings B1 thru B4) and fixed using the NZTA standard necked bolt fixings (refer NZTA Standard Drawings B5).

The referenced NZTA Technical Memorandum and Standard Drawings may be downloaded from the NZTA website at <http://www.nzta.govt.nz/network/technical/hardware/drawings.html>

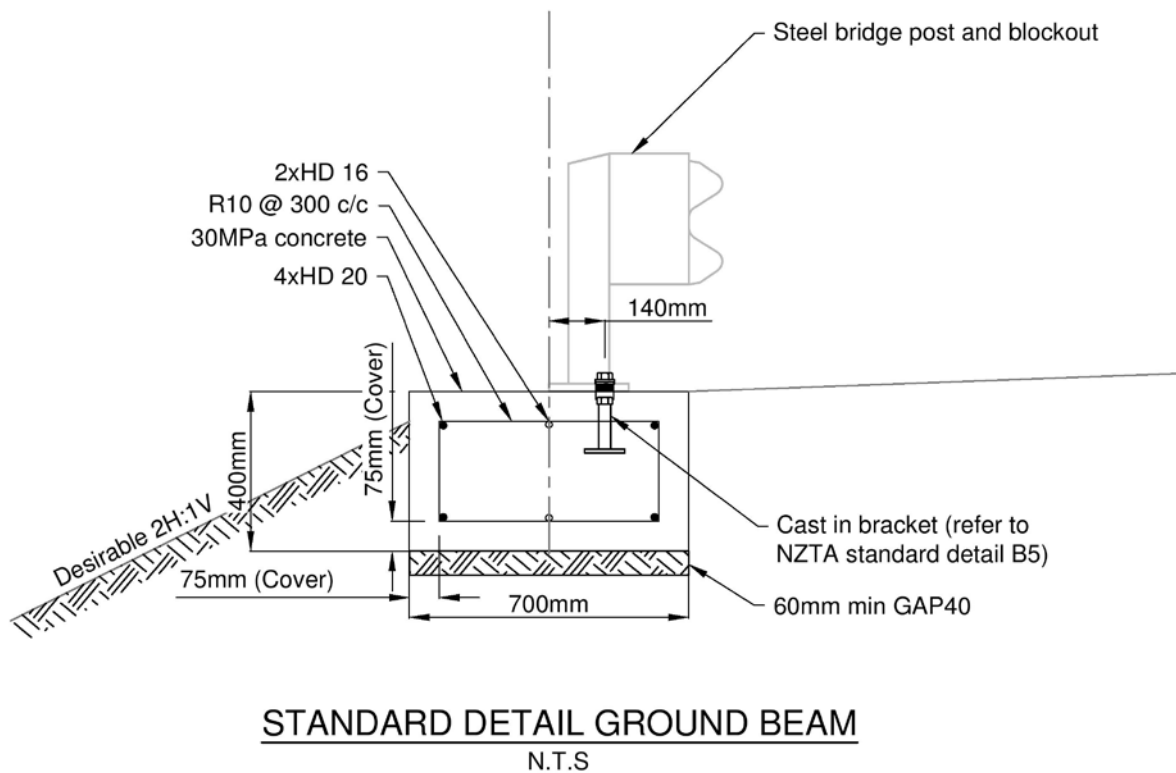
### Recommended practice

The ground beam should be constructed in accordance with the following:

- The minimum length of ground beam shall be not less than 20m.

- Excavation to be done to minimise over break and loosening of in situ material.
- All loose material to be removed from the trench before pouring concrete.
- The Cast in Bracket Assembly (NZTA Standard Detail B5) to be set out and fixed under the beam reinforcement before pouring concrete.
- Concrete strength to be minimum 30MPa at 28 days.
- Concrete to be poured on a bed of well compacted GAP 40 material (minimum depth 60mm).
- Concrete to be poured against trench sides, with neat edges formed using framing at the finished ground level.
- Road side of ground beam to be flush with shoulder.

In those locations on State highway projects where a ground beam is the appropriate solution but cannot be constructed in accordance with the dimensions shown, the proposed modifications and supporting rationale should be referred to the local NZTA Principal Safety Engineer for resolution or escalation.



**Figure 1: NZ Transport Agency Standard Detail – Ground Beam for Semi-Rigid Barrier Systems**  
(Note: Minimum length = 20m, cover to all sides to be minimum 75mm)

Endorsed by: National Traffic & Safety Manager