Nu-Guard 31™ Technical Note

Using low strength concrete around Nu-Guard 31™ Guardrail System posts

Purpose

To advise the recommended practice for the installation of Nu-Guard 31™ posts when installed in hard surfaces such as concrete footpaths.

Background

Nu-Guard 31™ posts should be installed in soil conditions that meet the requirements of AS/NZS 3845:1999 and TNZ Specification AP40. However due to its smaller footprint and no blockout requirement Nu-Guard 31™ may need to be installed in areas that have thick asphaltic layers or even a concrete footpath.

Barrier performance is a combination of the steel barrier ribbon strength and the lateral resistance of the posts. The Nucor post is manufactured from high tensile steel and is designed to yield at ground level allowing the W-Beam rail l to maintain height in an impact by sliding up the slot in the post until the bolt breaks through the top of the Nu-Guard 31™ post. As the concrete surrounding the Nu-Guard 31™ post has no flexibility, unlike soil, it can create a pinch point. In a vehicle impact this may cause the post installed in the hard surface to snap very quickly and as a result not give enough support to the W-Beam rail to perform as designed.

Full strength concrete strips can limit the Nu-Guard 31™ performance

Recommended practice

The recommended treatment involves creating a hole in the hard surface around the post to remove the possibility of any pinch point and fill with a low strength concrete/grout or flexible asphalt.

A hole in the hard surface material of 300 x 300mm square is to be keep clear around each Nu-Guard 31™ post in a side of road installation. The post sits centrally in the hole but at the front face closest to the road as shown in Figure 1. The post can sit against the hard surface at the front of the hole as the top of the post will only rotate backwards but the post area below ground will not rotate forward as with a timber post. The Nu-Guard 31™ post is installed in compacted soil under the pavement surface that meets the requirements of AS/NZS 3845:1999 and NZTA specification AP40.

After installation of the Nu-Guard 31™ post, the widened hole in the surfacing is filled with a grout mixture to a maximum depth of 150mm. This grout mixture is a recipe by volume of 7 parts sand, 2 parts water and 0.5 parts cement. The compressive strength should be about I MPa. It must not be a concrete mix (i.e no graded aggregate composition) but rather a uniform sand and cement matrix. This is the same mixture as per recommendation for around timber posts in the NZTA Technical Memorandum TM-2005.

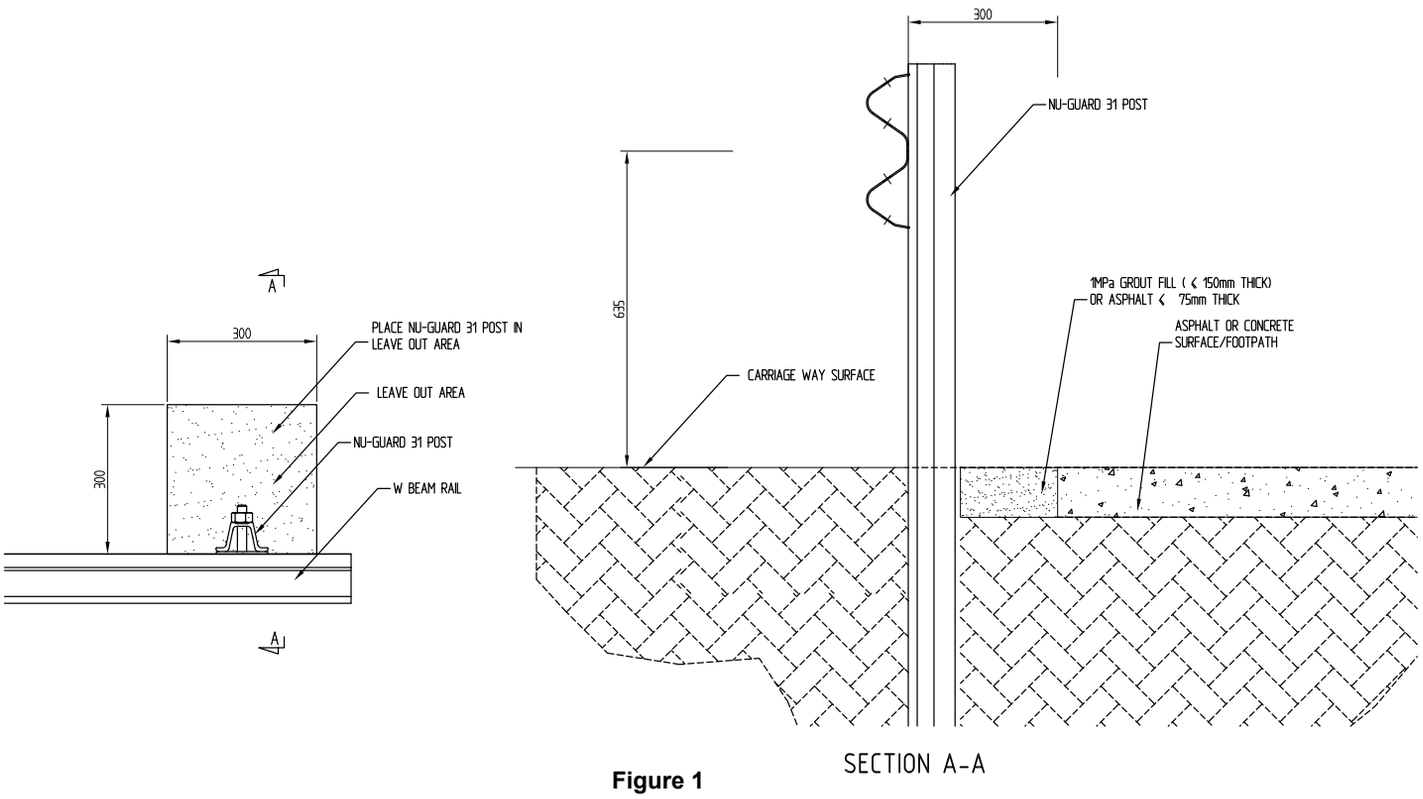

Figure 1

The top of the hole can also be filled with a topping asphalt with a maximum depth of 75mm. If the depth of the hole is greater than 75mm then a suitable compacted fill such as GAP20 should be used to bring the surface to the correct height before applying the asphalt.

The same applies for a median installation except the Nu-Guard 31™ post is placed centrally in the 450mm x 450mm hole in the hard surface.