

Technical Note 49

Theft Proofing of Aluminium Bridge Rail and Balustrade

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1 Background

Thefts of aluminium bridge rail and balustrade have occurred from a number of bridges in various districts. The aluminium is being stolen and sold for scrap.

This theft presents a major safety issue to road users and a financial liability to the Department of Transport and Main Roads. This technical note address means of overcoming this problem for existing and new bridges.

2 Existing installations

The following remedial work should be undertaken on existing aluminium bridge rail and balustrades.

One tack-weld should be applied to each nut. The size of the tack weld should not damage the separator (usually plastic or fibre) washers fitted between stainless steel nuts and washers and the aluminium baseplate.

Consumables used for this welding must be Grade 316 stainless steel. A 2.5 mm diameter electrode will be suitable. A minimum of three threads of the holding down bolts should protrude through the nut for welding to allow easy access to the joint for welding. This will also allow tack to be removed by grinding, if necessary, by maintenance personnel.

Under no circumstances should mild steel electrodes be used as their use will allow corrosion breakdown of stainless steel components.

3 Future designs

The use of aluminium bridge rail and balustrade should be limited to high corrosive environments, for example, salt spray zones. Aluminium rails should not be used in normal environments.

All new jobs shall have a note: "All stainless steel nuts to be tack welded to bolts using 316 stainless steel, with 2.5 mm diameter electrodes for anti-theft protection after installation".

