

Road bridge renewal

Allt Chonoglais, Scotland (UK)

The existing A82 Allt Chonoglais Bridge was identified as being understrength to carry future traffic loads. Its repair and strengthening was deemed uneconomic and so in August 2012 work started to demolish and replace the existing bridge with a new stronger reinforced concrete structure, incorporating both carbon steel and stainless steel rebar.

In order to create a durable and economic bridge over the full design life period it was decided by the consultant engineers that stainless steel rebar should be used in the areas which are at greater risk from chloride induced reinforcement corrosion due to the application of de-icing salts

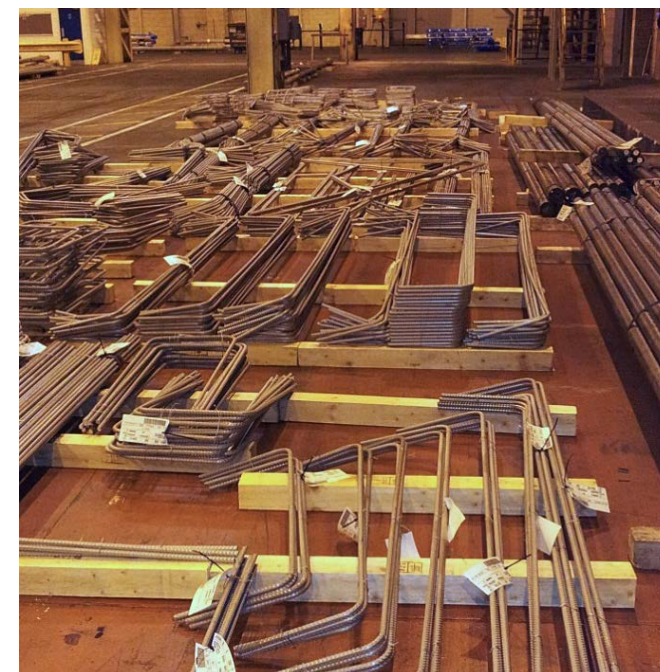
during the winter months. This included the bridge deck, abutments, wing walls and bearing plinths.

The original specification called for EN 1.4301 (304) stainless steel rebar, but after in-depth discussions with the supplier, steel designation EN 1.4362 (2304) was accepted as an alternative. Tests show that this grade has a Critical Chloride Threshold Level (CCTL) over 4% per mass of cement at room temperature, which is over ten times the figure usually associated with carbon steel rebar and beyond the levels normally expected at typical rebar depths of cover, concrete quality, and for a 120 year design life, even in the most severe of chloride environments. In order to avoid contamination with carbon steel, all of the stainless steel rebar was fully cut and bent to shape on machinery designed and used solely for stainless steel.



Details

Structural engineers:	Scotland Transerv, Glasgow
Owner/developer:	Transport Scotland, Glasgow
Fabricator:	Morrison Construction Ltd.
Stainless steel grade:	2304 (EN 1.4362)
Product type:	Reinforcement bar
Dimension:	Diameters 10, 16 and 25 mm
Total quantity:	67 t
Producer or supplier:	Otokumpu
More information:	otokumpu.com



From left to right: Demolished bridge - Replacement - Cut and bent stainless steel rebar segments