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TITLE
CASE STUDY THREE
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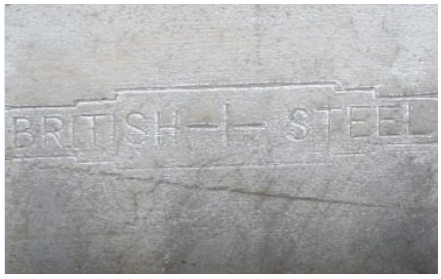
DURABILITY: BRIDGE IN THE NETHERLANDS AFTER 60 YEARS



The durability of galvanized coatings can be reliably predicted using a variety of techniques. One of the most reassuring is the use of case histories such as this Dutch bridge. Galvanized steel structures have been around for many decades and these examples provide real-world demonstrations of coating performance.

The Ehzer Bridge was built quickly by Canadian troops in 1945 in support of the liberation of the Netherlands. It carries a small local road, over the Twente canal, from Almen to Laren which is still being used by local traffic. The bridge is just wide enough to allow cars to pass in each direction but nearby bridges are now starting to take the fast urban traffic leaving mostly cyclists and pedestrians to use the bridge.

Visual inspection
The bridge was recently inspected by technical staff from the Dutch Galvanizers Association (SDV) who were struck by the good appearance of the bridge, which was characterised by a dull grey galvanized coating with only some light rust staining.

Some remedial work had been done in the vicinity of the bolted connections and youngsters with their spray cans had also contributed to the appearance of the bridge! Most importantly, the steel structure itself had not suffered any significant corrosion.

Remaining coating thickness
During the inspection, coating thickness was electromagnetically determined in a number of randomly selected areas, using an average of 10 readings at each location. At three diagonal bracing sections (150 x 150 mm) coatings of 74µm, 115µm and 219µm were found. At two other diagonal sections (130 x 130 mm) coatings of 69 µm and 82 µm were found. Two connecting plates were found to have coatings of 114µm (19 mm steel thickness) and 86µm (9 mm steel thickness).

In comparison with the thicknesses of the zinc layers as reported by Dutch galvanizing expert, Van Eijnsbergen, 25 years after the bridge was built there appears to have been no significant reduction of the coating thicknesses.

Note that the requirements of EN ISO 1461 for new galvanized steel are for 85µm for steel of section thickness > 6mm.

Future for the bridge
The Ehzer bridge at Almen could make it to 100 years without significant maintenance. Whether the bridge will actually last that long is dependent on other considerations. Will the road where the bridge is located remain a quiet local road or will heavier traffic be passing over it in due course? Or will the use of the canal change completely and the bridge clearance need to be changed or the span need to be increased?