RAIL BRIDGE

During refurbishment of a UK rail bridge in winter, heavy snow, extended cold periods and a continuous flow of water from concrete above the bridge beams, made it impossible to use an ordinary coating system. Preparatory blasting work in many areas was beginning to show significant re-rusting because of the delays in coating. The contractors, with expensive scaffolding and other infrastructure in place, were anxious to avoid any further delays and sought a solution using Alocit.

An area was chosen and a test application arranged. On the day of the application, the substrate was at freezing point and, although some coating was applied to this area, as it was below the recommended minimum temperature (4°C/38°F)

another, slightly warmer substrate area was chosen for the full test application, two on a vertical surface and one on a horizontal plane. After curing, testing showed coating thickness to be as specified and pull-off testing showed glue-line separation at 500, 750 and 900 psi. Testing to the coating on the freezing substrate also gave a reading of 900 psi before the glue holding the dolly to the paint surface gave way.

A very surface-tolerant coating, Alocit can be applied to areas with a certain amount of re-rusting, but some areas were so badly affected, it was decided to pressure wash before application. Many areas were too bad for this to be effective, so it was decided to flash blast and rinse with water to remove blast debris before applying the first coat.

On the day full application was due to begin, heavy snow had fallen with ambient temperatures well below freezing (-4°C/25°F), but spraying was able to commence using an in-line

Above: Freezing conditions for the bridge coating project.

Left: Before and after the first coat was applied.

Below: Spraying the first coat.

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AUSTRALIA

A&E Systems PTY Ltd
3/20 Clark Court, Bibra Lake,
Perth WA 6163, Australia
Tel: +61 (0)8 94183688
Fax: +61 (0)8 94183588
Email: aus@ae-sys.com

EUROPE

A&E Systems Ltd
3 Charles Wood Road
Dereham, NR19 1SX, UK
Tel: +44 (0)1362 694915
Fax: +44 (0)1362 695350
Email: uk@ae-sys.com

MALAYSIA

A&E Systems Sdn Bhd
26 Jalan Pendaftar U1/54
Seksyen U1, 40150 Shah Alam
Selangor Darul Ehsan
Malaysia
Tel : +60 (0)3-5569 4277
Fax : +60 (0)3-5569 4377
Email: mal@ae-sys.com

USA

A&E Anti-Corrosion
Systems LLC
150 Hilden Road,
Ste #301, Ponte Vedra,
Florida 32081, USA
Tel: +1 904 819-8985
Fax: +1 904 819-1430
Email: usa@ae-sys.com

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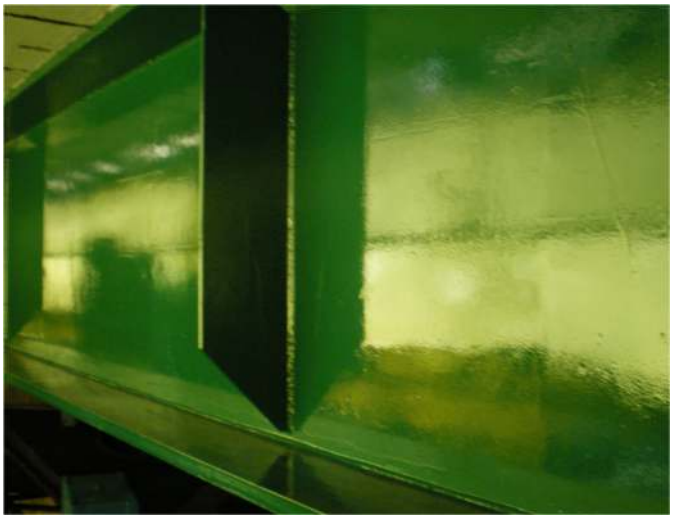
HIGH PERFORMANCE PAINTS AND COATINGS



heating block. The extremely icy conditions reduced the affect of dripping water, allowing large areas to be sprayed without difficulty. Remaining wet areas and stripe coating were accomplished using brushes.

The second coat of 'British Racing Green' was applied without any problems, producing a hard-wearing attractive finish for the bridge beams. On completion, final testing showed optimum film thickness was achieved, with pull-off tests showing adhesion in excess of 2000 psi with all separations occurring through glue-line failure.

Specification and inspection data

Paint System

2 x 300 micron/12 mil index coating system using 28.15 Grey RAL 7004 as a base coat with 28.15 Green 14c39 (British Racing Green) as top coat, giving final DFT 0f 600 microns/24 mil. Stripe coat all edges, welds and bolted areas. An index system uses separate colours for each coat to ensure proper coverage.

Preparation Specification

Abrasive blast to SA 2.5/SP10 to give a blast profile of 90-95 microns/3.5-4 mil, rinse down with water where needed on wet areas to clean off blast dust

Ambient temperatures

Minus 5°C/23°F - 12°C/53°F

Substrate temperatures

5°C/41°F - 20°C/68°F (raised using hot air blowers)

Material temperatures

In mixed form in batches of 30kgs (5 gal): 10°C/50°F to 15°C/59°F

At spray tip via heating block set at 20°C/68°F

Equipment data

Graco 68.1 airless spray pump fitted with 3/8 inch spray line with 1/4 inch whip end

XTR Graco spray gun with 4-21 thou spray tip

Graco In-line paint heater block

Film Thickness/Adhesion Testing

Average DFT - 615 microns

Adhesion - range between 1600 psi and 2000 psi with all separations in the glue line.

Top left: Spraying on the second coat, showing stripe coating of edges and welds.

Top right: Finished beams in British Racing Green

Above left and right: Checking Dry Film Thickness

Below: Pull-off testing showed excellent adhesion with no damage to the paint surface, even at over 2000 psi!