High Level Bridge Newcastle

Essential cold Metalock repairs

HIGH LEVEL BRIDGE NEWCASTLE

Designed by Robert Stephenson and built between 1847 and 1849, it is the first major example of a wrought iron tied arch or bow-string girder bridge. It is a fine and long standing engineering solution to a difficult problem; the spanning of 1337 feet of river valley, including 512 feet across water.

The High Level Bridge has six river spans of 125 feet (38 m) length, sitting on masonry piers, 46 by 16 feet in section and up to 131 feet (40 m) height.

There are also four land spans on each side, of 36 feet 3 inches. The single carriageway road and pedestrian walkways occupy the lower deck of the spans, 85 feet above the high water mark, and the railway the upper deck 112 above the high water mark.

The total weight of the structure is 5,000 tons.

Essential cold Metalock repairs

The bridge was closed to road traffic in February 2005 to allow essential maintenance to ensure the bridge's long-term future, including replacement of wooden supports beneath the road deck.

It was expected to reopen in late-2005, however, the reopening has now slipped as severe cracks were found in some of the bridge's iron girders.

Having assessed the bridge girders, engineers have decided to engage the services of Metalock Engineering UK Ltd to carry out the essential cold Metalock repairs.

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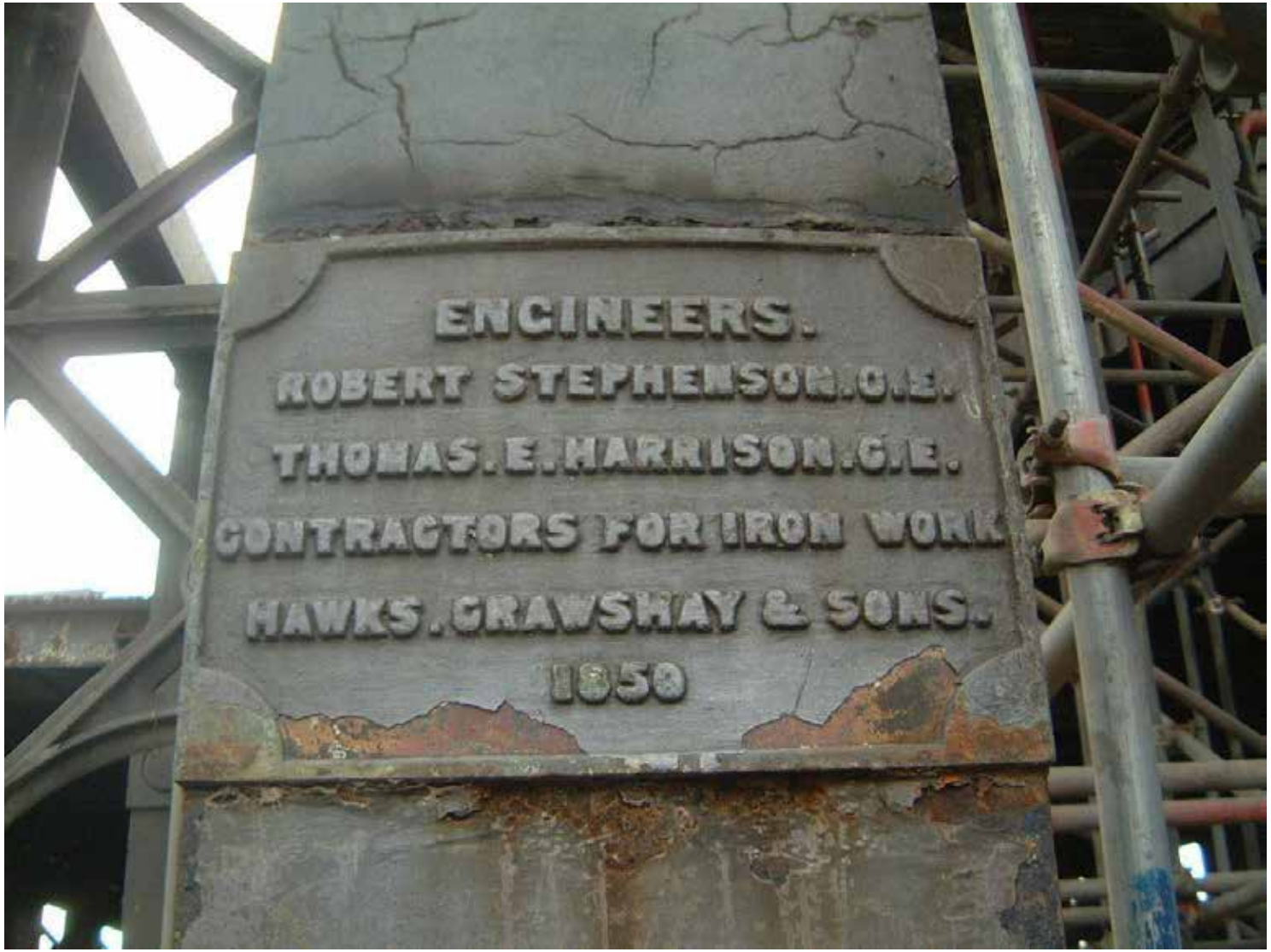
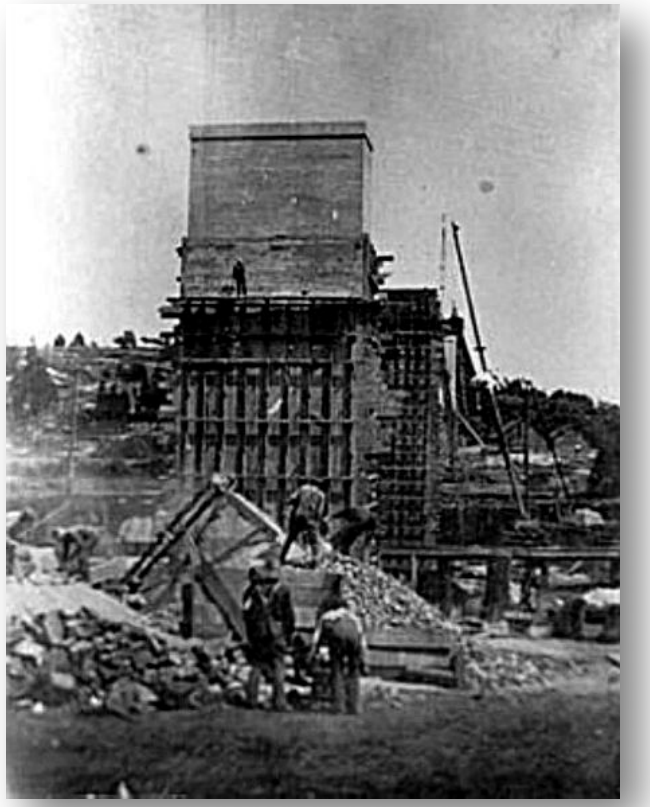

ENGINEERS.
ROBERT STEPHENSON.C.E.
THOMAS.E.HARRISON.C.E.
CONTRACTORS FOR IRON WORK
HAWKS.CRAWSHAY & SONS.
1850



THE HIGH LEVEL BRIDGE, BUILDING AT NEWCASTLE.—FROM A PICTURE BY MR. CARMICHAEL.—(SEE NEXT PAGE.)

Initial repair

Typical damage to Fascia Panels

False arch repairs



1050
ERIC

High Level Bridge Newcastle

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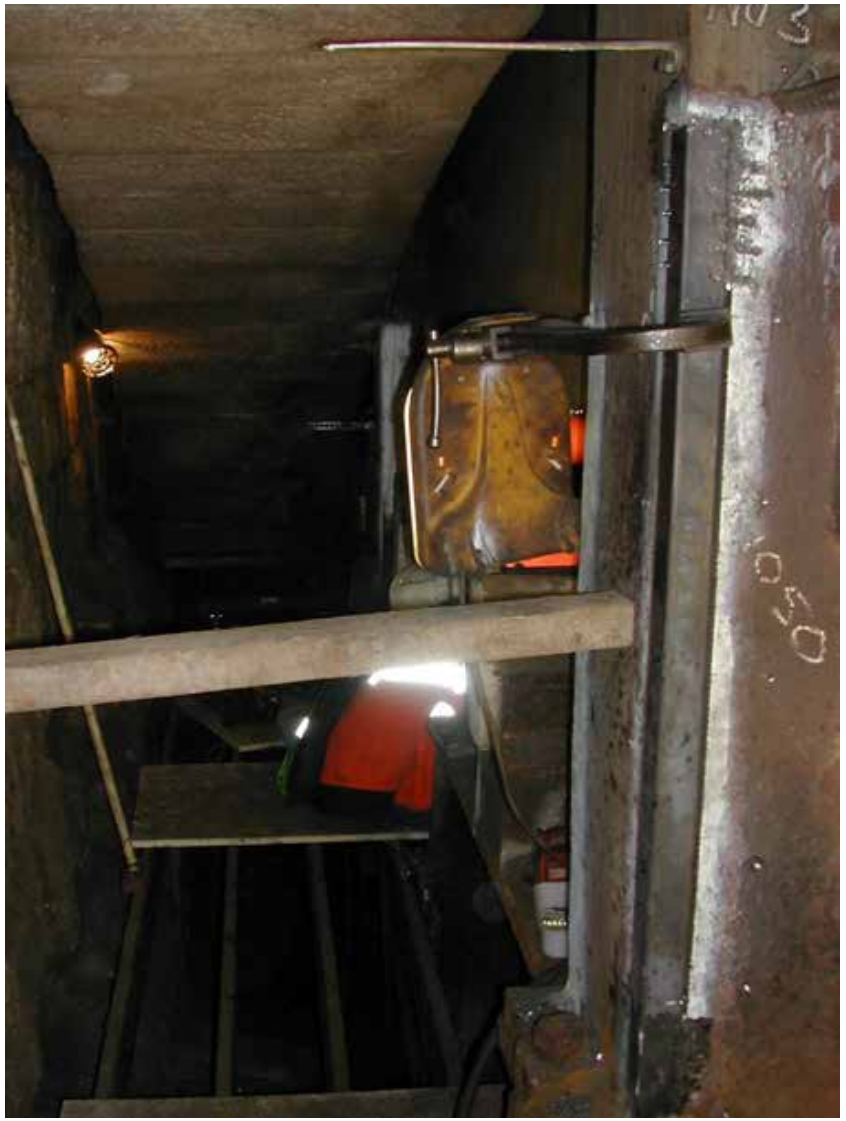

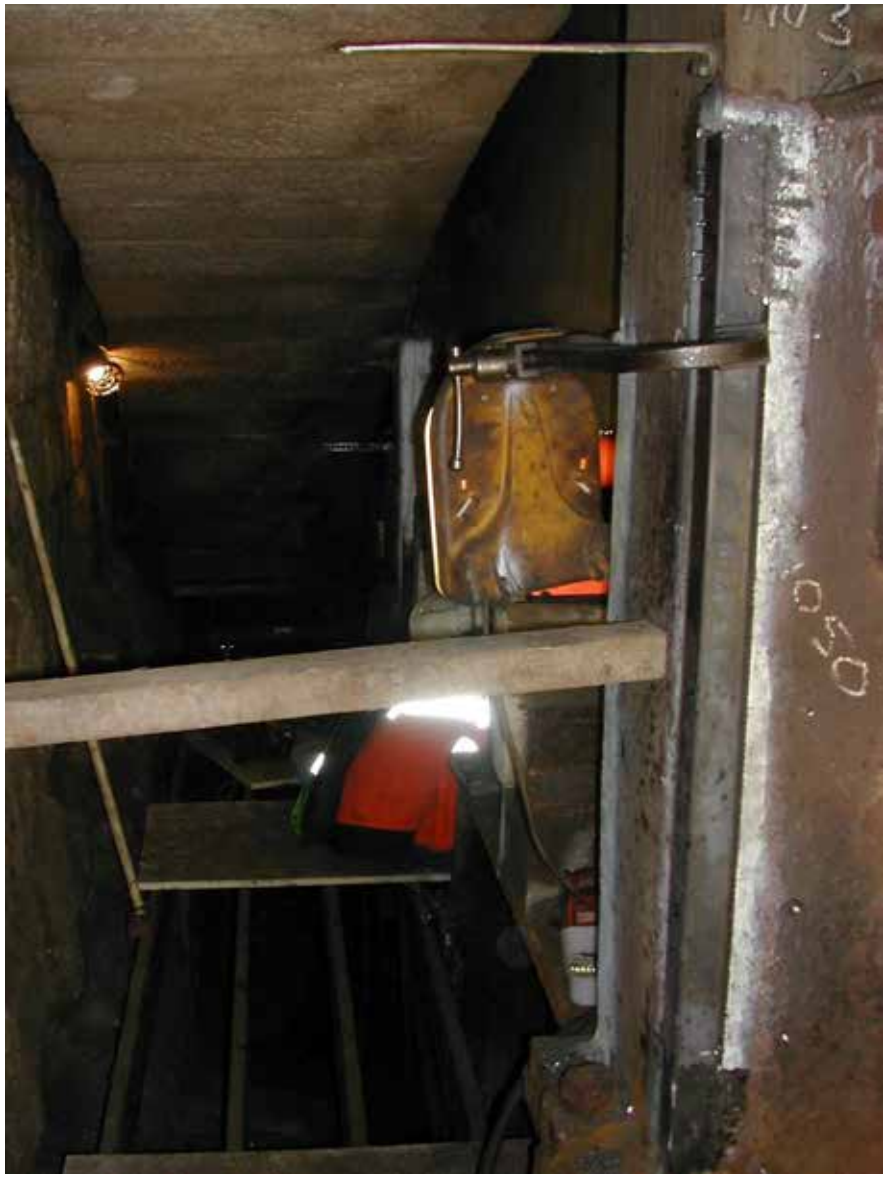

Gutter repairs

High Level Bridge Newcastle

Fascia & cornice panels

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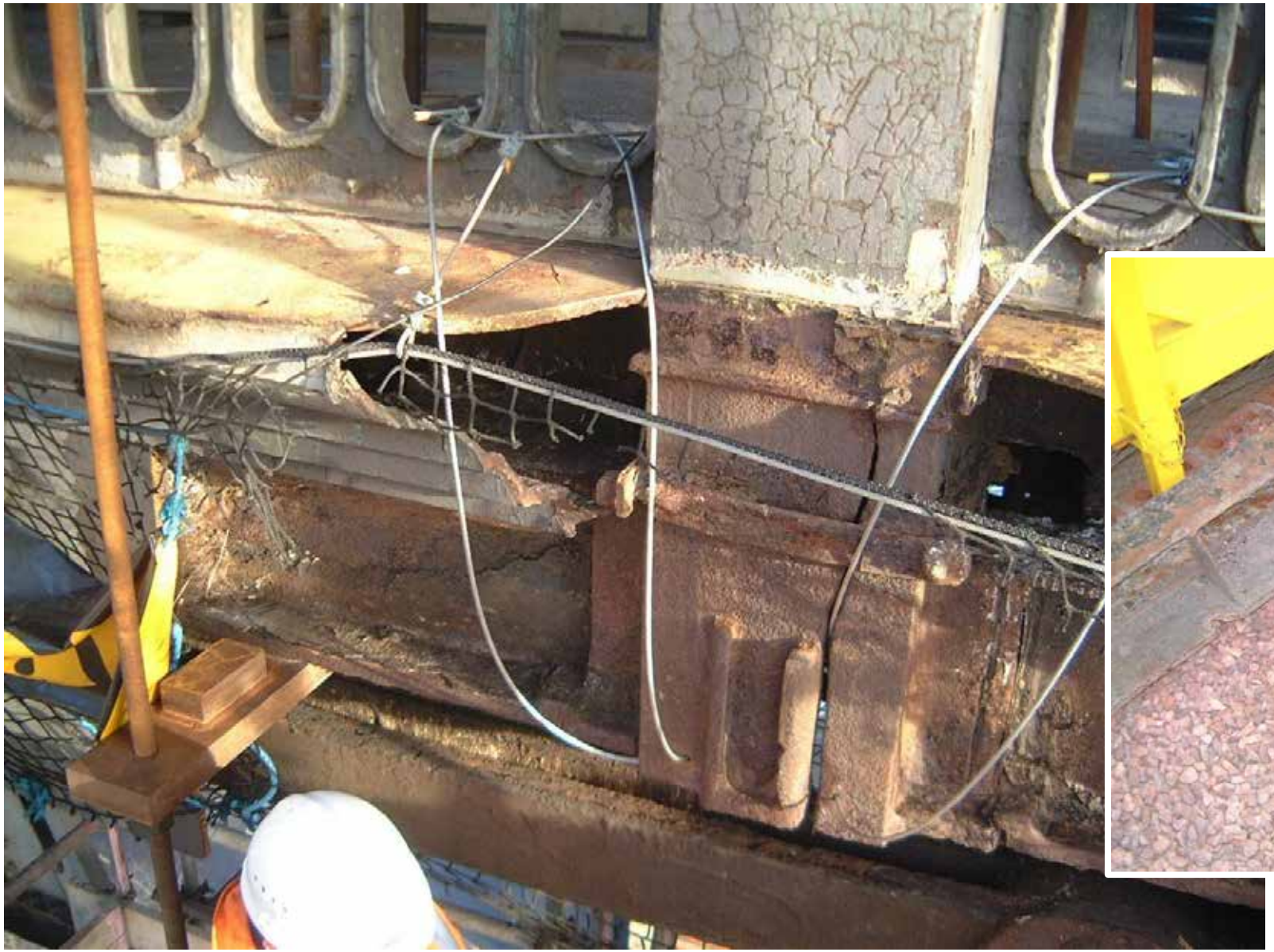
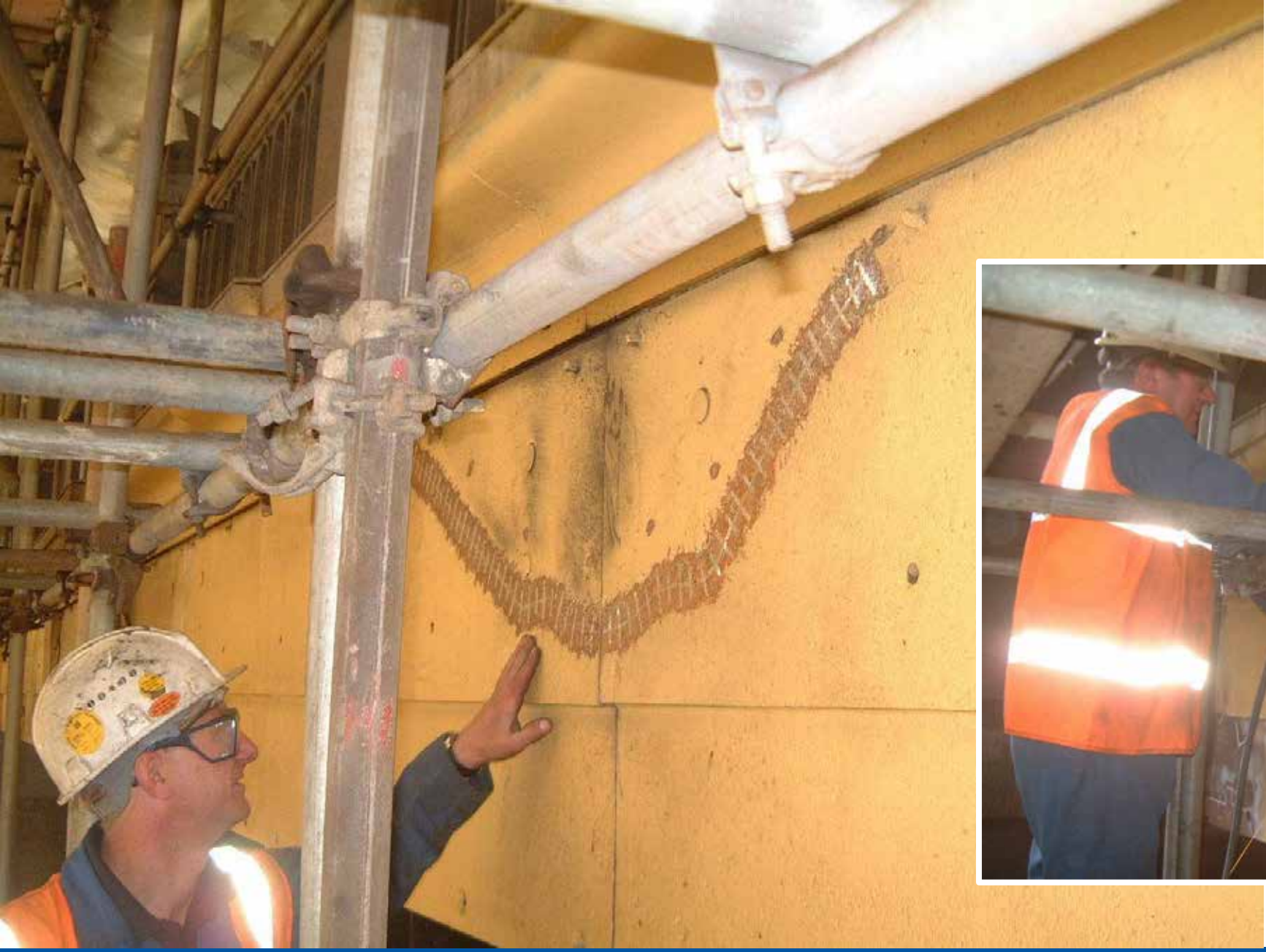
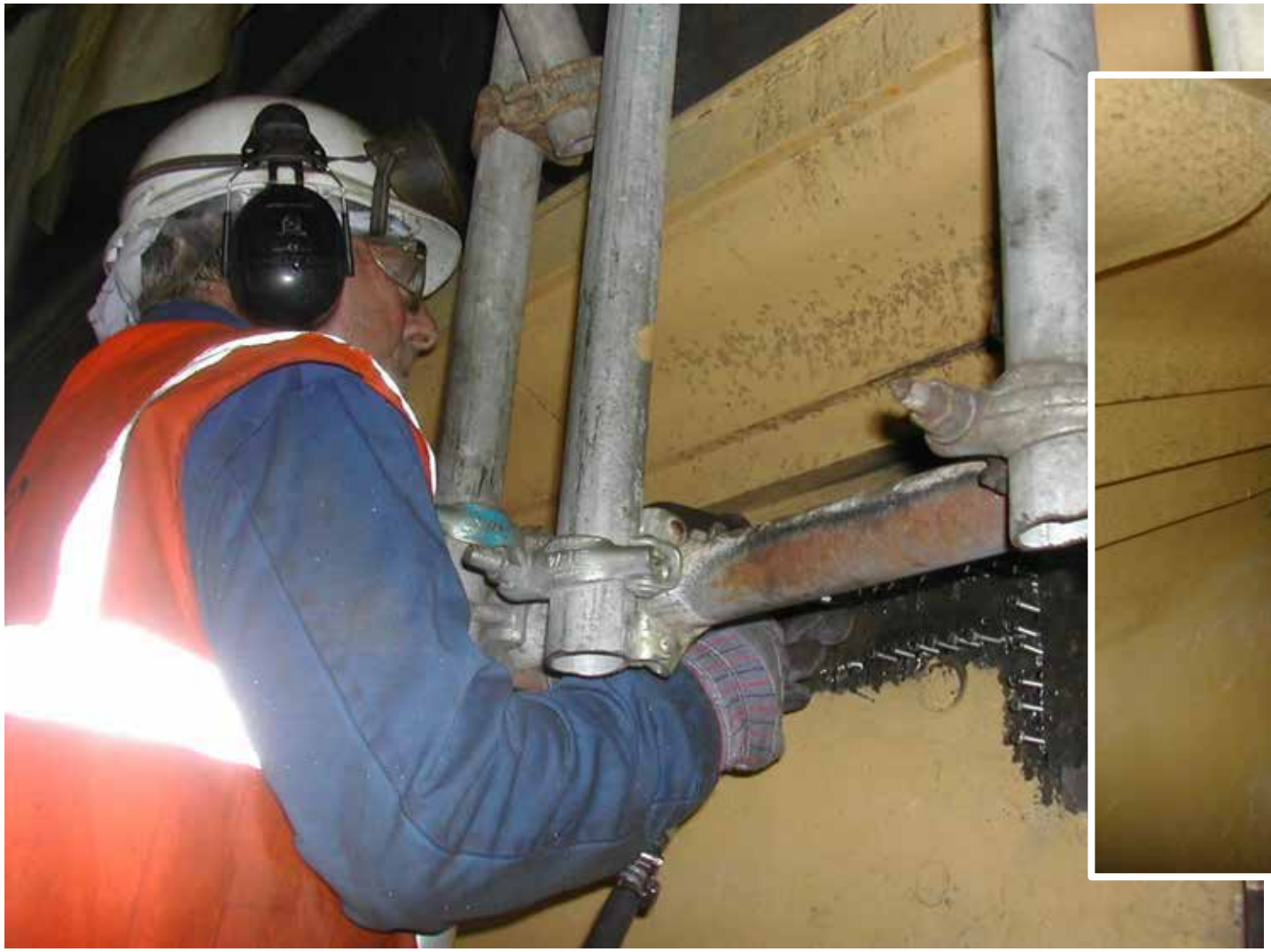




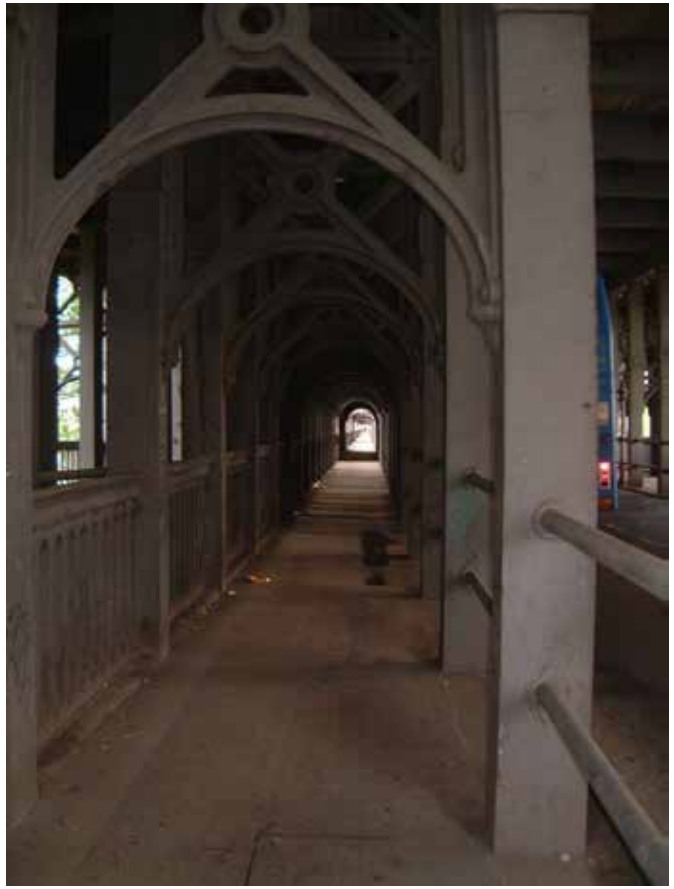



150
100
200
300

Columns


N FACE



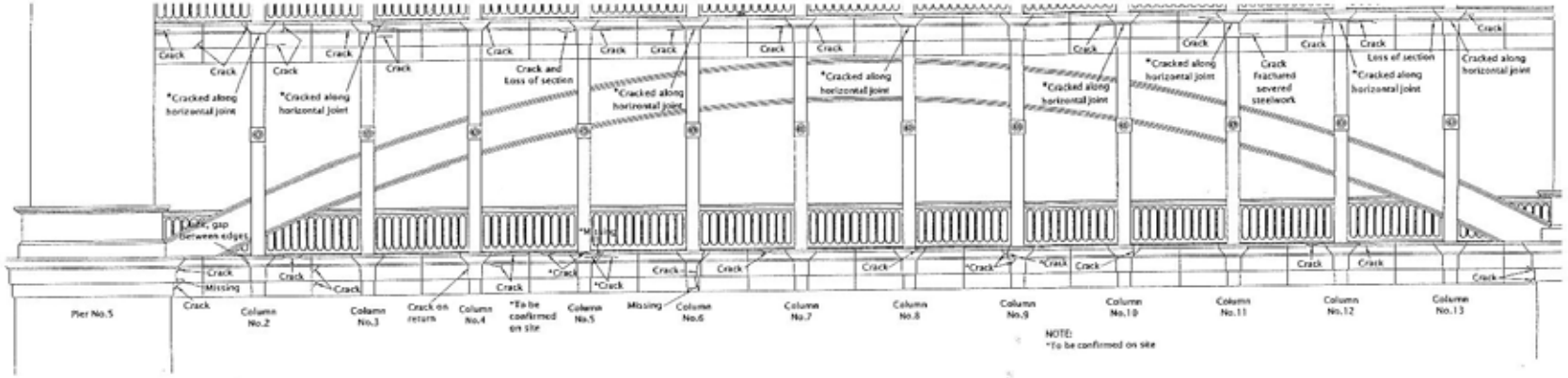



Assorted repairs

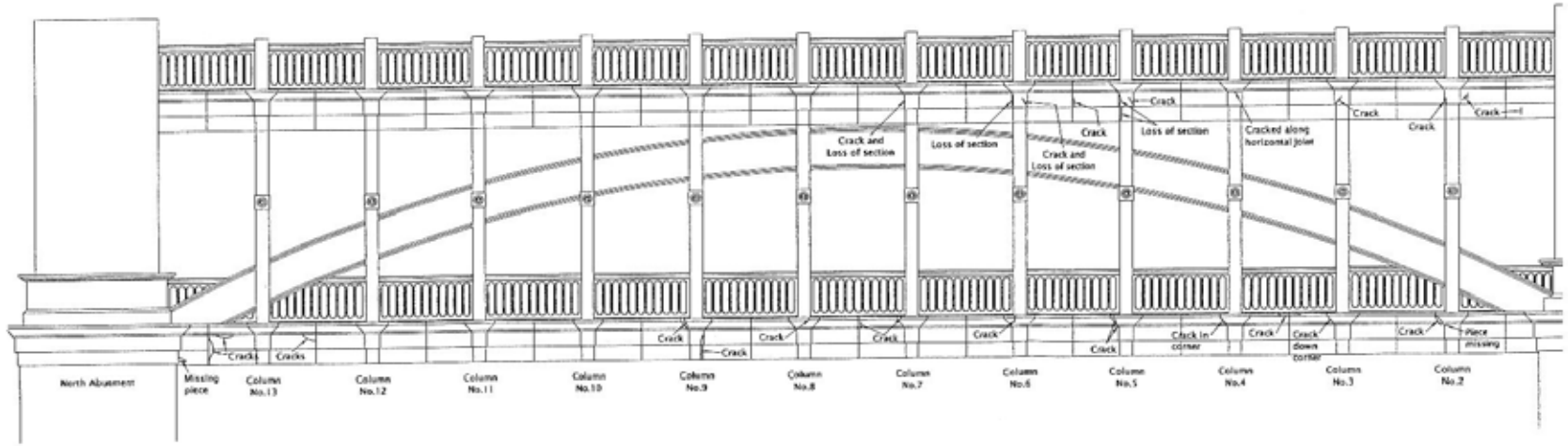



Commenced repairs on the Road Deck level

20th December 2004



East Elevation (Row A)



West Elevation (Row D)

Metalock Engineering Group®

Items still waiting a repair decision

Fascia plates

Longitudinal girder


2670

Longitudinal girder

- 140 Main Girders x 12 metres long span the Bridge
- 3 were removed and tested to destruction
- Metalock were asked to carry out repairs

High Level Bridge Newcastle

Cut into 2 piece by drilling and breaking along its weakest point.

Each Girder Section was placed into a machine at Manchester University and tested to destruction

All readings were within an acceptable level with the order being given to Metalock to repair


PALFINGER


Petroplus
HYSTER


HYSTER


HYSTER


HYSTER

Clamped, Optically Aligned and then verified by the Bridge Consultants before repairs begin


Metalock

High Level Bridge Newcastle

Metalock Engineering UK®


Joint 3


P6


HYSTER

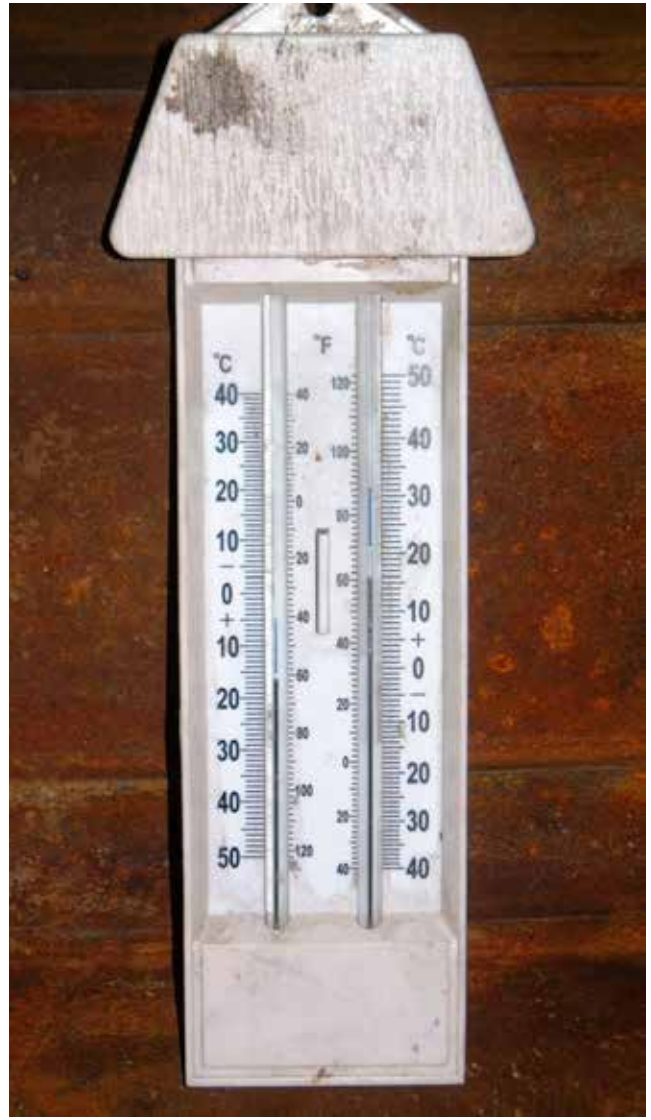
Removal of diaphragms

Wheel cleats

Metalock repairs completed

Metalock repairs are now completed and the next stage of repairs begins with Carbon Fibre strengthening

Maintain temperature


°C
40
30
20
10
0
10
20
30
40
50
°F
°C
50
40
30
20
10
0
10
20
30
40

Pull Off Test for Carbon Fibre Plates

Salt test

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24

Returned to site


ECO-Skate


FITZGERALD
HEWDEN


FITZGERALD


TEREX

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