

## CART ROAD UNDERBRIDGE

**CLIENT:** Transport for Wales

**LOCATION:** Cardiff, South Wales

**MAIN CONTRACTOR:** AmcoGiffen/Amey

**COMPLETED:** August 2024

Goldhawk Bridge Restoration in their capacity as specialist bridge surveyors and engineers were invited to undertake a load capacity assessment and design a remedial strengthening scheme for the Cart Road Underbridge in Cardiff, thereby enabling the introduction of an additional rail track on the line between Cardiff Central and Cardiff Bay stations.

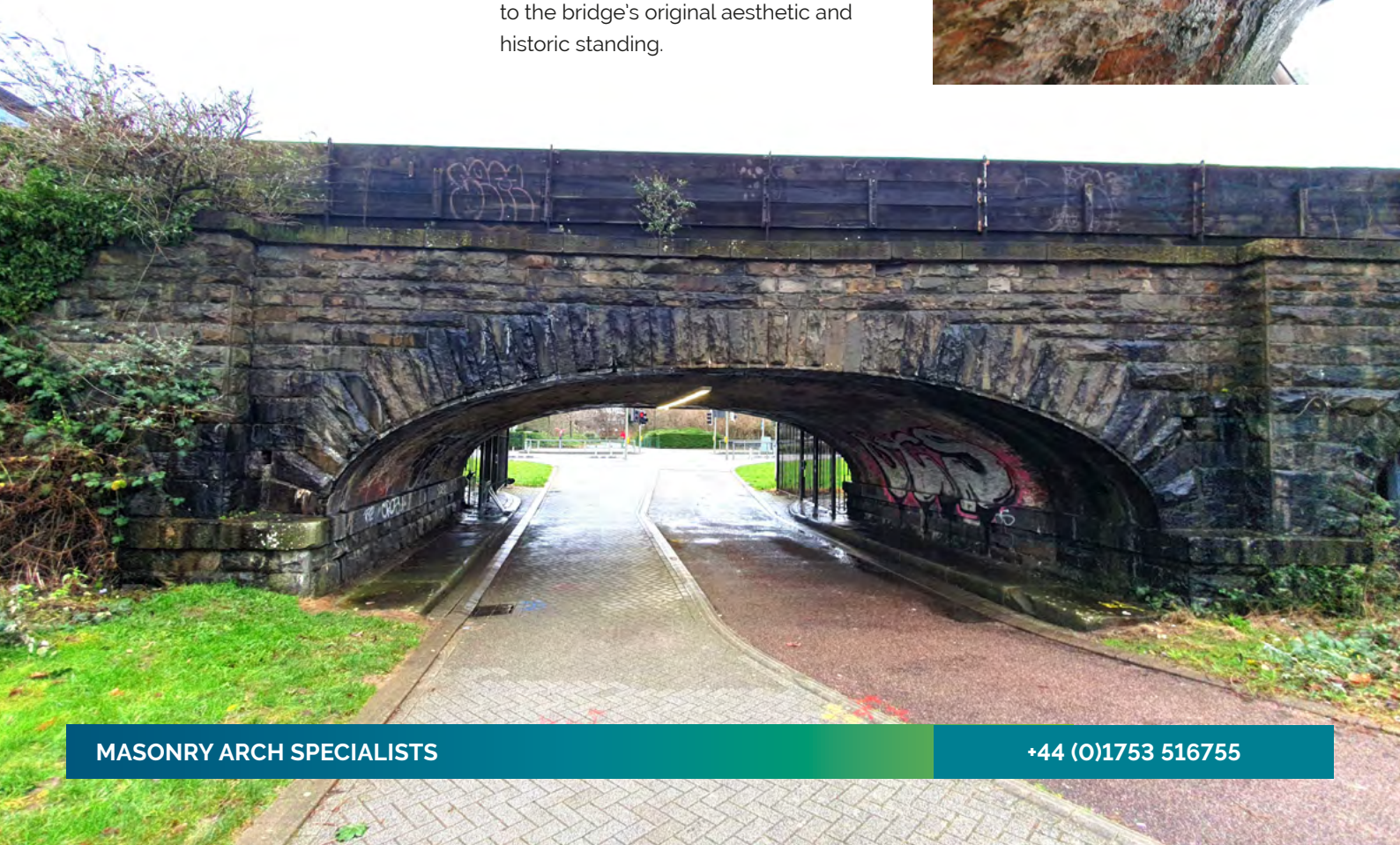
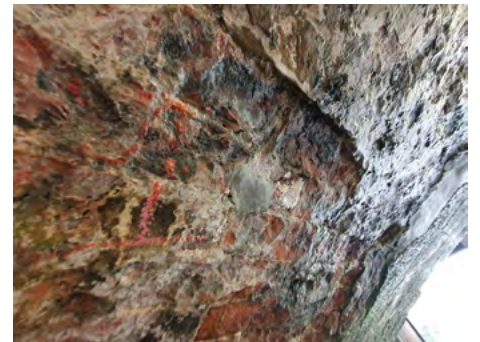


### Strengthening and rehabilitation of a historic Grade II listed rail bridge

#### The challenges and solutions

The resulting AIP report from our analysis in March 2023 defines the requirement for a MARS grid system to be installed into the soffit of the arch to enhance the structural capacity of the bridge.

The masonry in the arch barrel was in poor condition, with evidence of spalling and mortar loss over significant portions of the barrel and voussoirs. Various repairs had been previously been undertaken, using cementitious mortars and other such materials and that were unsympathetic to the bridge's original aesthetic and historic standing.





## Delivering on the client's brief

Due to the structural condition of the arch and the client's programme of works it was necessary to carry out the strengthening whilst allowing both rail traffic on the single line and construction traffic to lay the second new line. The propping system is to ensure a safe system of work.



### Specialist skills employed

- ✓ Removal and replacement of brickwork together with surface repairs and heritage pointing.
- ✓ Specific brick facing repairs to disguise the location of the masonry reinforcement.

## Benefits of the MARS system

The MARS system was chosen by the client to provide the bridge structure with the necessary capacity to support two rail lines and achieve **Route Availability 6** on both the up and down lines.

The MARS system could be installed whilst the programme of track alterations was completed and the existing line remaining open to rail traffic.



## A successful conclusion

Goldhawk Bridge Restoration successfully completed the programme set out by the client, Transport for Wales. CADW (Welsh Conservation) permitted the MARS strengthening system together with the repairs, as it met their stringent aesthetic parameters.

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