



GoldHawk take bridge from 3 Tonne to 40 Tonne weight limit

Client: Sheffield City Council

Location: Lower Bradfield, Sheffield

Engineers: Amey

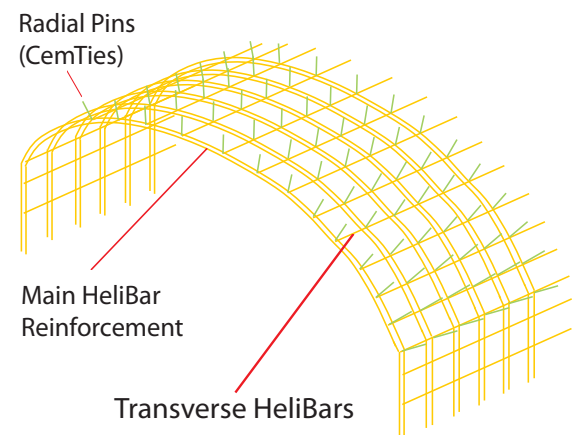
Installers: Goldhawk Bridge Restoration Ltd

As with many masonry bridges of its age, Smithy bridge was not fit for today's loading requirements. Sheffield County Council, via Amey consultants, instructed GoldHawk to undertake strengthening works to the bridge, to increase the bridge's loading capacity from 3 to 40 tonnes.

The bridge is located in the Low Bradfield conservation area, which lies within the Peak District National Park, it was therefore very important that any repairs preserved the bridge's aesthetics.

The GoldHawk Solution:

Goldhawk carried out a full structural assessment of the bridge using the ASSARC computer software program, enabling an optimised repair and strengthening scheme to be devised using the **MARS** system (**M**asonry **A**rch **R**ehabilitation and **S**trengthening).



- The bridge strengthening grid pattern was marked out on the underside of the arch and narrow longitudinal and radial slots cut into the masonry.
- Stainless steel HeliBars were bonded into the slots using Marflex (an elastic structural adhesive comprising durable polyureide) and interlocking hooked CemTies installed with HeliBond grout up into the arch ring at the grid intersections. Normal structural movement was accommodated with minimal disturbance to the retained original masonry.
- The entire reinforcement grid was encapsulated with Marflex, resin with high bond strength, which was colour matched to leave the bridge virtually unchanged.

Outcome:

The weak Smithy Bridge was sympathetically and economically strengthened to accept full highway loadings and comply with EU regulation. The concealed repairs left the bridge virtually unchanged but with its structural integrity restored at a fraction of the cost of full bridge replacement