



CASE STUDY

Union Chain Bridge Ground Anchors

THE PROJECT

Refurbishment of a 198-year-old Grade 1/
Category A listed bridge.

THE PROBLEM

The bridge's heritage meant any new designs had to fit with the original design and look of the bridge.

REMEDY'S SOLUTION

A new anchorage system involving 7no. highly loaded strand anchors, using latest design standards and new testing standards.

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Ground Anchorage System Replacement

Remedy Geotechnics was appointed by Northumberland County Council as geotechnical advisor for the refurbishment of Union Chain Bridge, a Grade 1/ Category A listed bridge joining Scotland and England across the River Tweed. The 198-year-old suspension bridge has huge historical significance as the oldest vehicle-carrying bridge of its kind in the world. The £7.3m scheme, currently in development phase using National Lottery funding from the Heritage Lottery Fund, is working towards a second-round submission in 2019.

For the English tower, Remedy designed new ground anchorages to replace the original anchorage system comprising steel plates excavated into the bedrock. The new anchorage system involves 7no. highly loaded strand anchors drilled into the bedrock. Because of the high loads and restricted access, 7no. Multiple Stage Anchors will be verified using the

new testing standard, BS EN ISO 22477-5:2018. The layout of the anchors was selected to minimise the risk of clashing with the exiting anchorage plates, as the tower needs to look the same once the works are complete. Due to constraints on the Scottish side of the bridge, vertical piles were chosen to provide the anchorage. The high lateral and tensile forces imposed by the restored chains anchored into the new pile cap are counteracted by 12no. 900mm diameter piles. Concerns over the concrete of the pile section cracking under high lateral loading have been addressed by carrying out a detailed lateral loading analysis and calculating concrete crack widths to ensure they were within the limits of BS EN 1992.

Contact Remedy Geotechnics - we'll give you an answer every time.

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