

Case Study

Abercorn Bridge



The Abercorn Bridge was built to a Hennebique design in 1932. Having served the local community of Newtownstewart for over 80 years, the four span steel reinforced concrete bridge was showing signs of severe deterioration and was subject to a one lane 3 tonne weight restriction.

Location
Newtownstewart, UK

Client
**Graham Structural Solutions,
N. Ireland Transport**

Completed
December 2014

Structure
**4 Span Bridge
(Hennebique Design 1932)**

The Concrete Society Awards



The Problem Identified

Abercorn Bridge was suffering from a significant amount of corrosion, which had consequently reduced the strength of the bridge.



The Solution Developed

A detailed survey and a series of non-destructive tests to determine the condition of the bridge was carried out. In addition, a Finite Element Analysis (FEA) model was developed to determine structural behaviour.

Utilising the results of the survey work, a minimum disruption repair solution was designed using a DuoGuard™ hybrid anode system to halt ongoing corrosion and prevent further damage. Initially an external power source was used to apply an impressed current to stop active corrosion and render the steel passive. The DuoGuard anodes were then disconnected from the power source to self-generate a galvanic current, sufficient to maintain steel passivity and control corrosion. A range of DuoGuard hybrid anode sizes were used in this designed solution. A monitoring station was installed with the DuoGuard hybrid anodes to track the condition of the steel reinforcement within the structure.

Abercorn Bridge was reinstated to a two lane usable bridge without taking away from its original appearance and at a price significantly lower than replacement.



The Benefits Provided

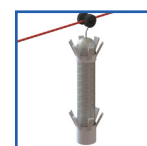
Corrosion related deterioration of Abercorn Bridge has been halted. After the initial power up period using an external power source, the DuoGuard system is self powered thus minimising future maintenance requirements and associated life costs.

This project received the 2014 Northern Ireland Concrete Society, Certificate of Excellence award (Restoration category).

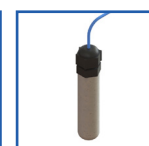


Severe deterioration, Abercorn Bridge

CPT Products Used



DuoGuard™
500 & 750



MN15
Reference
Electrode



DuoCrete
SD Mortar



CPT
Monitoring
System

Number of Anodes used: 4,000



ISO 9001
Cert No. 10159