

Case Study

Shelbourne Hotel Dublin

cpt

Opened in 1824, the Shelbourne Hotel, Dublin is one of the most prestigious and well known hotels in Ireland. In 1901-1902 an extra floor was added to the hotel comprising concrete encased structural steelwork with a brick facade.

Location
Dublin, Ireland

Client
McFarland Associates Ltd.

Completed
Summer 2015

Structure
Heritage Building (Hotel)



The Problem Identified

During external work to the Shelbourne Hotel façade it was noticed that the structural steel work was corroding and causing cracking to the encasement material. The material surrounding the structural steel was identified as a clinker concrete by its dark colour and extensive voids.



The Solution Developed

Testing found that all corrosion rates were above the threshold for passive steel. In addition, the fully carbonated concrete was providing no protection against corrosion. A DuoGuard™ hybrid anode system was designed to halt the ongoing corrosion and prevent future damage. Using an external power source, an impressed current was applied 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 trial was done before the full system installation to ensure compatibility with the clinker/steelwork arrangement and to collect on-site data to aid design. During the impressed current phase, the clinker concrete let current freely pass between the anode and steel. In phase two the galvanic current output was effective at maintaining steel passivity at a spacing of 300mm between installed anodes.

A monitoring system was installed on the roof to provide continuous feedback on the system's performance, using a remotely accessed datalogger powered via an attached solar panel.



The Benefits Provided

Corrosion related deterioration of the Shelbourne Hotel was halted. After the initial power up period, the self-powered DuoGuard hybrid anodes minimise all future maintenance requirements and associated life costs.

Traditional methods of repair to 20th century steel framed structures are often costly and disruptive with only short to medium term results expected. DuoGuard hybrid anodes offer a long term and minimally intrusive alternative solution to managers of heritage assets.



Shelbourne install



Shelbourne complete

CPT Products Used



DuoGuard™



DuoCrete
SD Mortar



ISO 9001
Cert No. 10159