

STRUCTURAL STRENGTHENING OF PLINTH WITH FRP AT A UK REFINERY

SUMMARY

- **Application:** Concrete plinth Strengthening
- **Location:** South UK, refinery
- **Installation:** CSNRI UK service team

BACKGROUND

CSNRI has been a long-term supplier of pipe repair solutions to a refinery in the south of the UK and has become a trusted partner.

During an inspection engineers identified deterioration of an existing structural concrete plinth at the refinery. CSNRI was engaged to design a solution with fiber-reinforced polymers (FRP) and perform the installation with a tight schedule.

ISSUE

The 8ft by 2ft plinth was suffering from corrosion which included shear cracks where the plinth's T-beams met the column, spalling concrete and steel corroding at several locations on the reinforced concrete structure.

The plinth is one of many that hold the weight of a large tank which holds a wax slurry vessel with an operating weight of just over 92.3 tonnes/203,000 lbs.

The site operators were concerned about the plinth's ability to function as designed leading to possible safety concerns at the facility.

SOLUTION

CSNRI worked with FyfeFRP, a sister company, to provide an engineered repair proposal to restore the shear capacity to the two plinths.

Fyfe FRP designed a solution to increase the shear capacity of the concrete plinths using the Tyfo fiber-reinforced polymer systems.



Surface prepared, cracked and damaged areas filled



Tyfo S applied to the surface area

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The rehabilitation work included the application of the Tyfo SCH-41 uni-directional carbon fiber-reinforced polymer system oriented in both vertical and horizontal directions on both faces of the plinths. The shear capacity provided to the structure by the Tyfo SCH-41 system was calculated per ACI 440.2R-17, Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures.

The work involved thoroughly cleaning the concrete structure of loose debris, and the filling of any cracked and damaged sections. The FRP was then applied using the wet layup method, which sees the FRP material thoroughly saturated with epoxy before being applied to the surface.

In all, the CSNRI team took eight days to complete the repair.



Horizontal layers applied



Completed installation