FRP Strengthening on the London Underground System

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FRP Strengthening on the London Underground System

Reasons for Using FRP 1

• Strengthening in the case of marginal assessment failures where we could not make a business case for reconstruction (i.e. no stock or speed restrictions)

• Plating is fraught with problems. It has been found very difficult to get a satisfactory weld to old steel and plating a rivetted structure within the short work “window” and limited space is impractical.

• FRP is a cold applied strengthening method and is light and easy to handle. It is also fast and easy to apply in short possessions.
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Reasons for Using FRP 2

• As strengthening on Cast Iron structures where their position makes it prohibitively expensive to replace them. It often proves impossible to make the business case for replacement when there is no stock or speed restriction involved
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Successes

Cast Iron struts at Shadwell

Covered way CW12/58 at High Street Kensington

MR46A

D90B at Olympia
COMPOSITE STRENGTHENING

at

BRIDGE MR46A

Station Road, Harrow

for London Underground’s Metropolitan Line

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Under the bridge

The ageing Hammersmth Road Bridge crosses three rail lines and is part of one of west London's busiest roads. When the time came to strengthen the weakening structure, the use of specialist materials kept disruption to a minimum. Helen McCormick takes a closer look.

Strengthening a 140-year-old road bridge on several railway lines is not a task to be undertaken lightly. The bridge was originally built in 1869 and is currently undergoing a £2.1 million upgrade to improve its stability and safety.

The bridge is located on the A3 road, which is a major thoroughfare in west London, and carries three railway lines. The upgrading work is being carried out by Network Rail and is expected to be completed by mid-2007.

The upgrade work involves the installation of new steel beams and a new concrete deck to support the bridge's existing structure. This will improve the bridge's load-bearing capacity and extend its life span.

The work is being carried out in stages to minimise disruption to traffic and railway services. The work is expected to be completed by summer 2007.

The upgrade work is part of a wider rail investment programme by Network Rail, which aims to improve the safety and reliability of the rail network in west London.

The Hammersmth Road Bridge is a key component of the rail network and its upgrade is an important step in ensuring that it remains safe and reliable for many years to come.

For more information, visit Network Rail's website.

For further information, please contact Network Rail.
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Recent Difficulties


This recommends a design life for FRP of 40 years! What is the basis for this?

Effectively, this destroys any business case, as at best in theory we will only get a 40 year life extension on a structure that has much of its’ life already expired.
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Question – What do we mean by Bridge/Structure life?

Bridges will last for as long as they will carry their required load! A proportion of LU bridges are older than 120 years and so in theory they are fully depreciated and therefore have no value. In practice this is untrue, there are of full strength in good condition and are likely to remain for at least another 100 years, their replacement cannot be justified on any economic grounds, and to do so would cost huge sums of money in disruption costs.