

## Carbon Fibre Telford Homes



**FREYSSINET**  
SUSTAINABLE TECHNOLOGY

**Client**  
Telford Homes

**Engineer**  
White Young Green

**Frame Contractor**  
Atlantic

**Strengthening Design & Installation**  
Freyssinet Ltd

**Contract Duration**  
1 week

**Works Completed**  
Sept 2009

Telford Homes' Queen Mary College project in South Woodford, London, is a multi-phase residential development. The last zone to be completed included a large podium slab which would provide a landscaped access area to the apartments with car parking below. Due to a late change in the loading requirements the podium slab had been cast with insufficient reinforcement in just one bay towards the centre of the slab.

Freyssinet were initially engaged to investigate the options available to bring the slab up to the necessary performance criteria. It was apparent that the additional strength could be provided by a relatively small amount of fibre reinforced polymer (FRP) plate bonding.

The slab to be strengthened was a 325mm thick RC slab, reinforced with H20 bars at 150 centres.

The Freyssinet solution comprised five strips of S&P CFK 200/2000 carbon fibre plates bonded to the soffit of the slab at 900mm centres. Each strip was 6.9m long and went from the centreline of the support at one end to within 100mm of the face of the support beam at the other end of the 7.2m span.

The timing of the works was critical to the client as there was a narrow window of opportunity between no longer needing the area below the slab for site storage and handover to the new residents.

Freyssinet's site operations were commenced and completed within the week. Various services including two substantial cast iron drain runs could be left in place as they were suspended below the slab and the strips could be threaded above the pipes, even with as little as 100mm gap. As the M&E plant had been installed it was important to shot blast the soffit concrete (to improve bond) in such a way as to minimise dust. Sheeting of the enclosure and dust extraction equipment helped here.

The strips being just 1.4mm thick, provide an unobtrusive method of repairing or strengthening RC slabs. The installation causes minimal disruption as noise and dust can be virtually eliminated thus the process is ideally suited to live or near-live situations such as this.



- 1** The FRP laminate
- 2** Resin is applied to the soffit and the strip.  
Note the masking tape on the soffit allows easy removal of any over-spill resin.
- 3** Strength testing of the substrate.
- 4** The finished FRP strips. Freyssinet were able to work around the pipes without their removal.

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