

Location: Birmingham

Client: BaS LIFT (NHS) Calthorpe Estates

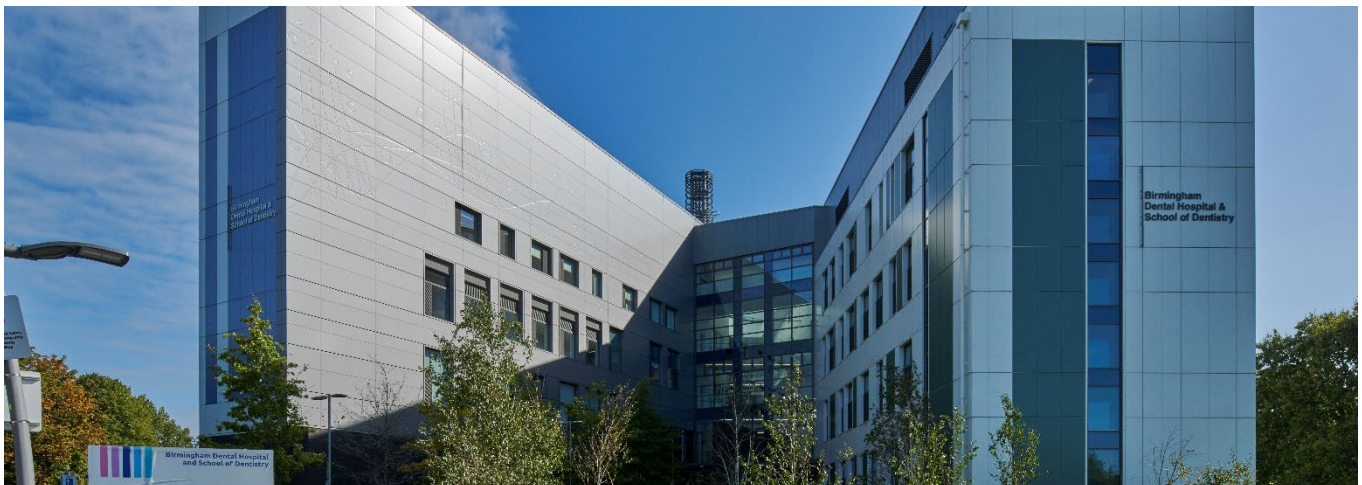
Frame Contractor: MPB

Main Contractor: Galliford Try

Post-tensioning Design: CCL

Post-tensioning Installation: CCL

Year of Completion: 2014



With a build cost of £50 million, this four-storey dental hospital and school of dentistry, provides world-class research facilities for more than 600 undergraduate and postgraduate students.

CCL designed and supplied the horizontal slabs from ground to fourth floor and installed its XF post-tensioning flat-slab system over five floors. The building's two separate wings had different geometry and loading requirements. After carrying out a value engineering exercise, CCL reduced the thickness of the slabs in both wings using post-tensioning instead of reinforced concrete techniques, from 400 mm to 275 mm and 300 mm.

The south block is approximately 112 metres long with several concrete stability cores along its length. The client wished to avoid structural movement joints if possible, but this would have made it twice as long as most published guidance recommends.

CCL undertook a thermal analysis of the structure in order to determine and advise on the likely effects of thermal movement and restraint on the post-tensioned slabs. Additional reinforcement was provided where indicated by the analysis, to control and distribute long-term strains.

The intended use of the building meant laboratory areas needed tight control on footfall-induced vibration. CCL undertook vibration analysis to provide advice on local slab thickening requirements, and on expected response factors to demonstrate compliance with client requirements. Several soft spots were created in the roof slabs to accommodate flexibility requirements for rooftop plant. Post-tensioned band beams were installed to provide structural support.