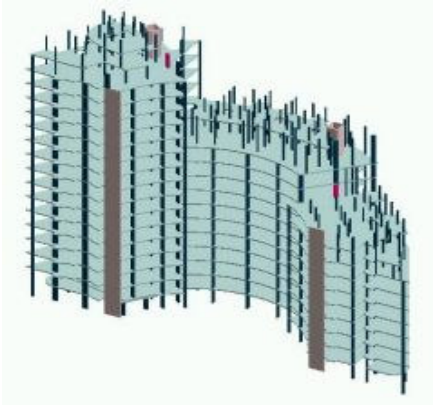
City Island Development - Leeds

The Project

Capita Symonds (Structures) were initially acting for Mayfair Developments Ltd and were retained for Civil and Structural Engineering services for the design of the 14 storey, £32m mixed use development comprising 400 private residential apartments complete with car parking and associated external works.

The structural form of the building consists of an in situ reinforced concrete (RC) frame utilizing flat slab construction supported off RC columns. At ground level there is a transfer slab allowing column positions to be located to suit car parking arrangements. The basement car parking extends across the entire area of the development. Overall stability for the frame was derived through a series of RC cores and shear walls.



The Design Concept

Due to the building being curved and varied internal layouts, an irregular column layout had to be used. These irregular layouts would have resulted in traditional analysis techniques being too lengthy and/or inaccurate. Having researched the various analysis software available , SuperSUITE seemed the most appropriate to use.

As the building stepped back at the higher levels the 'split' functions proved very useful to model the building accurately.

The scheme was split into six elements; two blocks were modelled to thirteen stories, there were then three further models created for the superstructure. These were created in order to accommodate a movement joint within the building. The output from these models was used to design the transfer slab utilizing the FEM Plate module.

The use of the plate module enabled the floor slabs to be designed quickly. The reinforcement input commands allowed the bars to be continually varied until the optimum bar sizes and spacing was obtained not only for design but also to allow sensible on site fixing arrangement.

Recent Project Developments

Phase 1 of the development has been completed. Phase 2 of the development, valued at circa £20m started in early 2006 and 'topped out' at 20 storeys in early 2008 and is one of the tallest (12th tallest), most eye-catching buildings in the city.

"The key benefits of the 3D structure model were that we could accurately model a complex irregular building. We were also able to ascertain foundation loads very quickly to reduce the Contractor lead in time on site." Wayne Balance, Associate Director, Capita Symonds

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