Thomasons LLP

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Thomasons was founded in 1947 and is now one of the most established independently owned consulting engineering firms in the UK. The firm has established a deserved reputation for engineering excellence, innovation and a high quality of customer service, a process that is measured year by year in our customer surveys. Thomasons prides itself on its success rate for building long term relationships with its customers, some of whom we have worked with since we were founded.

The firm and its associated companies currently operate from five regional offices in Guildford, London, Leeds, Manchester and Southend-on-Sea with approximately 135 staff. We work throughout the UK and have also undertaken projects internationally in areas including Ireland, France and the Channel Islands.

Thomasons undertakes commissions in all areas of civil and structural engineering including major healthcare, education, residential, retail and mixed use town centre redevelopments. The firm has a reputation for solving unusual and complex technical problems and extensive experience in the design of infrastructure and civil works, particularly for larger developments. The design of roads and drainage to adoptable standards is a normal part of our activities. The open structure of the firm allows us to tackle projects ranging from minor works to those costing many millions of pounds, in a cost and technically efficient manner.

Thomasons is committed to modern design and management techniques and is at the forefront in the application of information technology. Each of our offices has modern computer and communication networks and full Autocad and 3 dimensional drawing capabilities. The firm keeps abreast of emerging environmental issues.

An ISO9001 Quality Management System is operated in all offices and externally audited by a UKAS accredited assessment body.

Short Description

Woodgrange Road

The project is situated on the corner of Woodgrange Road and Station Approach in Forest Gate area of London E7. It is a mixed commercial and residential development comprising six blocks. The site is rectangular in shape with the blocks arranged around the perimeter leaving a courtyard in the middle largely comprising ground floor car parking. The blocks comprise a refurbished public house, two new-build masonry blocks and three concrete framed blocks up to 7 storeys in height. ESA-Prima Win was used to model the concrete framed blocks comprising of flat slab construction supported on piled foundations. These concrete framed blocks comprise commercial areas and car parking at ground floor and a communal landscaped garden area at roof level.

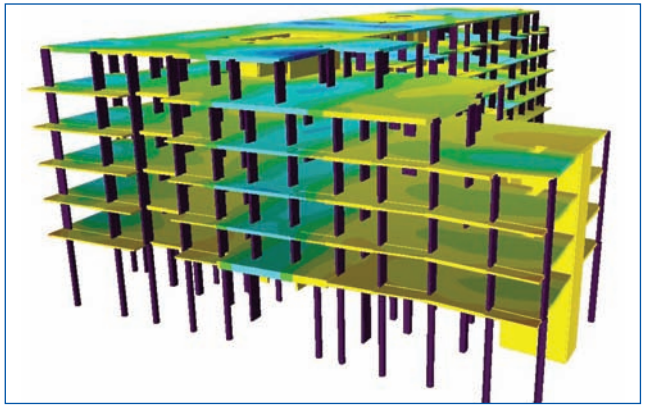
Project Information

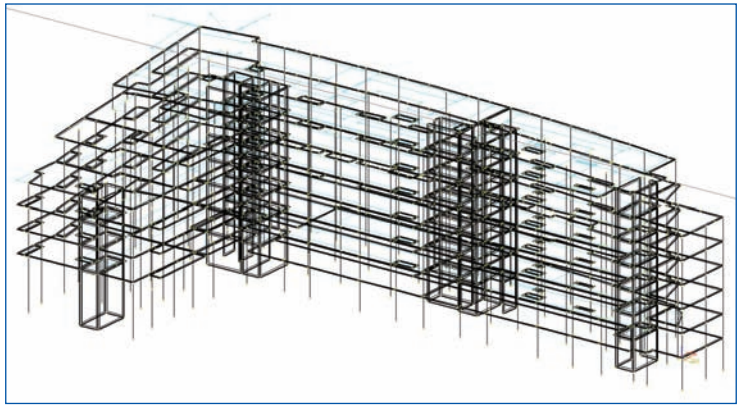
Owner: One Housing Group
Architect: Stock Woolstencroft
General Contractor: Galliford Try Partnerships
Engineering Office: Thomasons LLP

Construction Start: 08/2006
Construction End: 09/2008
Location: London, United Kingdom

The development is situated on the corner of Woodgrange Road and Station Approach in Forest Gate area of London E7. It is a mixed commercial and residential development comprising six blocks. The site is rectangular in shape with the blocks arranged around the perimeter leaving a courtyard in the middle largely comprising ground floor car parking. The blocks comprise a refurbished public house, two new-build masonry blocks and three concrete framed blocks up to 7 storeys in height. ESA-Prima Win was used to model the three concrete framed blocks. The three concrete framed blocks range in height from 4 to 7 storeys. These three blocks appear as a single L-shaped block however a vertical movement joint separates one of the blocks from the other two.

The buildings on each side of the movement joint are treated as independent structures. The blocks comprise of flat slab construction supported on concrete columns and ultimately on piled foundations. Reinforced concrete walls within the lift cores and staircase cores provide the lateral stability for the blocks. Precast concrete slabs are present at ground floor, supported on ground beams and pile caps. At ground level, these concrete framed blocks comprise part commercial areas and part car parking. A mezzanine level is present in two of the blocks typically above the car parking areas hence creating seven storeys. At roof top levels, private gardens and a communal landscaped garden area are present, comprising of paved, turf and planter areas.





Used software: ESA-Prima Win

Woodgrange Road, London E7

An opening through one of these concrete framed blocks provides a vehicle access route into the courtyard area and car parking areas. As a consequence, a transfer slab is present locally at first floor level to bridge over this vehicle access route in order to support the 5 storeys above it. Another transfer slab is present for the top storey, again locally above the vehicle access area only because the column positions for the top storey are different to those below. There were many challenges when undertaking the design of the three concrete framed blocks and these included the following:

- The three concrete framed blocks were created in a single ESA-Prima Win file; this ESA-Prima Win file comprised of two independent structural models due to presence of vertical movement joint separating one of the blocks from the other two blocks.
- The general plan outline of the three concrete framed blocks is L-shaped however not many floor edges are straight due to the presence of faceted slab edges, the presence of inset balconies and also cantilever balconies. In addition, each floor plan area is different due to each storey height being stepped.
- The blocks comprise of many column types ranging from circular, rectangular and square. In addition, the shape and/or size of many of these columns is not consistent all the way up the building. This was dictated by both architectural and cost constraints.
- The commercial areas are effectively 2-storeys in height as the mezzanine floor is not present in these areas. As a consequence, these columns are typically larger at ground floor level to cater for the increased column height however were reduced in size the higher up the building in order to reduce construction costs.
- An ESA-Prima Win creep analysis was undertaken to determine the additional reinforcement required to control deflection to acceptable magnitudes. This was particularly important for these blocks as the maximum span between columns was over 7 metres over the car parking areas. In addition, the creep analysis was particularly important for the transfer slabs and also the roof top slabs supporting the garden areas where loading was higher than typical roof loading conditions.
- Reinforced concrete shear walls forming the lift and stair cores provided the lateral stability for the blocks. The large pile caps supporting these cores were analysed using a separate ESA-Prima Win FE model.

The ESA-Prima Win software allowed us to analyse and design the building structure to a degree of economy that would not have been possible using more conventional software packages or hand calculations. The nature of the software also helped us to assess the effects of design development decisions quickly and efficiently. This allowed us to have a key role in the value engineering of the building.