Thomasons

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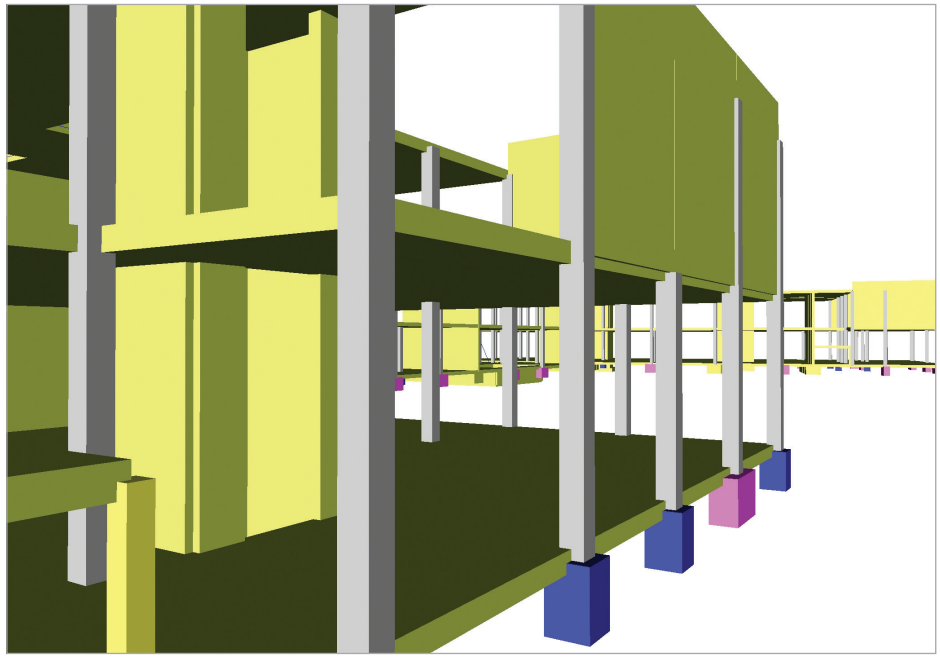
Thomasons
Consulting Civil & Structural Engineers

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. The firm and its associated companies currently operate from regional offices in Guildford, London, Leeds, Manchester, Birmingham 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.

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



Software: Scia Engineer

Broadwater Farm and Learning Campus - London, United Kingdom

The project is situated along the northern side of Adams Road within the Tottenham district of London.
The site is rectangular measuring approximately 45 m by 20 m. The main two-storeyed section of the building consists of three approximately area equal wings. The building is being built in two phases with a 50/50 split. The construction of phase 1 is about 40% complete.

Description of the project

The school building has been designed as a two storey RC frame with the floor and roof slabs designed as 300 mm thick flat slabs. The vertical loadings are transferred to foundations through a system of RC columns and shear walls. The span of the slabs varies from 4 m up to 8 m.

With the building being erected in two phases, a construction joint has been incorporated, running through middle of the intermediate wing. The detailing of the construction joint allows for the transfer of vertical and horizontal forces from one part of the building to the other.

The three wings of the building are separated by movement joints, which allow for differential horizontal movement between each part. The detailing of the movement joints allows for the transfer of vertical forces from one part to other.

The lateral stability of the building in phase 1 is provided by a system of RC shear walls, and has been calculated with each wing being treated as an independent structure. In phase 2, the stability of the third wing is provided by a mixed system of RC shear walls and sway frames with moment connections between the columns and the slabs.

There is a mixture of cladding/finishes to the building such as glazed canopies, a link between the existing building and new building, and projecting windows which has the required structural steel framing to be integrated with the RC frame. An interesting visual effect has been created by the ‘brise soleil’ shading elements, this is a vertical system of panels to the front elevation and horizontal shading panels for doors and windows. The steel structure for these was also designed by Thomasons.

In the intermediate wing at ground floor level, there is a swimming pool. This has been formed using an in situ RC box to form the main pool structure below ground level. The ground floor slab has been designed as a RC flat slab supported on piles and pile caps.

Approach

There were many challenges that were faced during the design of the building, these include the following:

- There were many mechanical and electrical service routes that had to be incorporated in the structure at all levels. Therefore a single 3D model for the building was required so that pile reactions could be accurately calculated.
- Calculation of long term creep deflections were difficult to calculate manually due to the unequal spans of the slabs. Scia Engineer was very beneficial in assessing creep and this was found to be the governing design criteria.
- Analysis of slab openings to determine reinforcement requirements.
- Assessing the lateral stability of building using frame action and shear walls system.
- Steel frame canopies and links were designed as sway frame structures.

The use of Scia Engineer

The Scia Engineer software was very useful as we were able to calculate accurate pile loads, calculate the internal forces in elements and determine reinforcement requirements. Especially important were results of the long term slab deflections which were governing for this project.

The software also enabled us to quickly incorporate changes proposed by the Architect and Services Engineers and see how changes affected our design.

The visualisation tools in the results section of Scia Engineer let us quickly analyse several structural solutions to find the most economical solution.

Broadwater Farm and Learning Campus

London, United Kingdom

Project information

Owner	Harringey Council
Architect	Gollifer Langston
General Contractor	Mulalley
Engineering Office	Thomasons (London)
Construction Period	From July 2010 to August 2012
Location	London, United Kingdom

Short project description

The project is situated along the northern side of Adams Road within the Tottenham district of London. The site is rectangular measuring approximately 45 m by 20 m. The main two-storeyed section of the building consists of three approximately area equal wings. The building is being built in two phases with a 50/50 split. The school building has been designed as a two-storeyed RC frame with the floor and roof slabs designed as 300 mm thick flat slabs. The vertical loadings are transferred to foundations through a system of RC columns and shear walls. The span of the slabs varies from 4 m up to 8 m.