

Thomasons

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Nomination

Thomasons
Consulting Civil & Structural Engineers



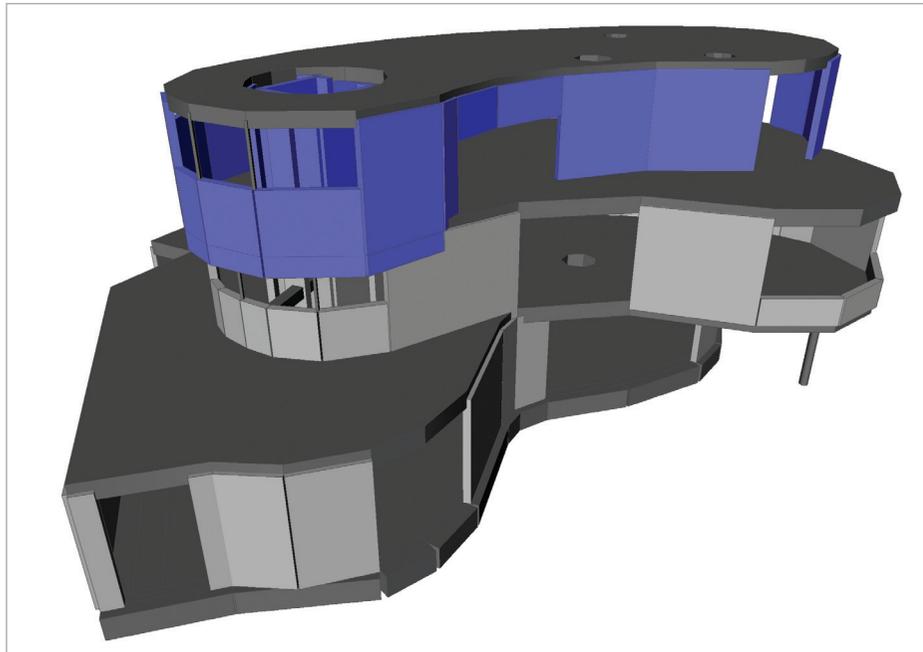
Thomasons was founded in 1947 and is now one of the most established independently owned consulting engineering firms in the UK.

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

St Mary of the Angels Primary School - London, United Kingdom

The project is situated on Shrewsbury Road adjacent to Westbourne Park Road in the Bayswater area of London W2. The site is rectangular in shape with the new building taking up half of the site. The school is a three-storeyed 'kidney shape' building with external staircase and ramp. Other parts of the site are taken up by play areas. Thomasons input on this project comprised the full civil and structural design.

Description of the project

Each floor of the building steps over involving a number of cantilevered areas. The architectural arrangement involved relatively free internal spaces. Due to these issues, as well as the curved plan profile of the building, a concrete frame was chosen.

The building structure consists of RC slabs (350 mm - 450 mm deep) supported on RC walls/columns. Except for the lift walls, there is no continuous line of structural support. A staircase wraps around the lift shaft and is therefore not providing any support to the floor slab. Due to the irregular shape of the building, the concentration of loads and soil conditions, piled foundations were chosen.

The external staircase has been designed as a curved RC structure supported on RC columns due to the shape.

The stability calculations formed a big challenge as there were no continuous vertical walls. The frame action of the structure has been taken into account to provide lateral stability. One of difficulties in design were the existing retaining walls, running along the street and pavements, because of which the ground floor slab had to be cantilevered over piles with positions determined by retaining walls bases.

Approach

There were many challenges when undertaking the design of the building. They comprise of the following:

- The whole main structure of the building has been modelled in one Scia Engineer file to get reactions on piles. The reason for this is that each floor acted as a transfer slab with a different location of support and therefore without modelling the whole structure. The results could not be predicted.
- Scia Engineer software allowed the long term deflection and stresses to be obtained.
- Analysis of slabs. Taking into account large openings. Openings were undertaken to ensure correct reinforcement requirements.
- Lateral stability of the building has been analysed taking frame action into account as there were no continuous shear walls.
- The spiral staircase around the lift core was detailed based on results from Scia Engineer. Especially useful was in this case the Scia Engineer option of main stresses and forces trajectories preview.
- RC ramp has been designed .

The use of Scia Engineer

Scia Engineer was very useful, as we were able to analyse different structural solutions and advise to the architect the best economical solution which allowed the interesting shape of building and visual effect to be achieved.

Visualisation of results: maps, values, trajectories helped us to get the most economical structural solution.



St Mary of the Angels Primary School

London, United Kingdom

Project information

Owner Westminster City Council
Architect Ingleton Wood
General Contractor Speller Metcalfe
Engineering Office Thomasons (London)
Construction Period From December 2009 to October 2010
Location London, United Kingdom



Short project description

This project is about the St Mary of the Angels Primary School, situated on Shrewsbury Road adjacent to Westbourne Park Road in the Bayswater area of London W2. The three-storeyed 'kidney' shaped building, with cantilevered slabs on each level, has been designed as a reinforced concrete frame structure and full FEM analysis was undertaken.

Using Scia Engineer software let us connect the required architectural visual effect with the most economical building solution.

