# Faber Maunsell Ltd

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Faber Maunsell operates throughout the United Kingdom and in many countries overseas.

The firm provides a comprehensive service to clients over the broad range of building engineering skills. The services provided by the firm include:

- Feasibility Studies
- Concept Designs
- Detailed Engineering Designs
- Security Assessments and Strategies
- Project Management
- Technical Audits
- Asset Management/Building Aftercare

The firm engages approximately 3.000 staff who undertake projects within small teams of highly experienced engineers under the control of a project director and working with the latest design aids to produce innovative solutions to the complex problems of modern building construction. The firm has specialists in the following:

- Mechanical and Electrical Engineering
- Civil/Structural Engineering
- Public Health Engineering
- Geotechnical Engineering
- Applied Research and Advanced Technology
- Environmental, Sustainability and BREEAM
- Health and Safety and CDM Coordination
- Software Development
- IT/Telecommunications
- Advanced Security
- Specialist Lighting
- Facilities Consultancy
- Fire Protection
- Geotechnical
- Acoustics
- Water Engineering

Over the years the firm has gained experience in a wide variety of projects that currently fall into the following categories:

- Universities, Colleges and Schools
- Laboratories and Research Facilities
- Hospitals
- Offices and Corporate Headquarters
- Shopping Centres, Flagship Stores and Retail Parks
- Residential
- Hotels
- Museums, Entertainment Venues and Performing Arts
- Factories and Storage Facilities
- Telecommunications Centres
- Airports
- Prisons, Courts and Defence Establishments
- Media and Broadcasting Studios
- Leisure Centres, Arenas and Stadia

The wide range of work undertaken by Faber Maunsell enables staff to bring to each new project the skills derived from a variety of sources. The company encourages staff to think of themselves as problem solvers, to fully use their skills, experience and imagination, to be innovative and to maintain a real enthusiasm for the building process.
Regional offices are located in Aberdeen, Beckenham, Belfast, Birkenhead, Birmingham, Bristol, Cambridge, Cardiff, Coventry, Darlington, Dublin, Durham, East Malling, Edinburgh, Exeter, Glasgow, Leeds, Leicester, Liverpool, London, Manchester, Newcastle, Norwich, Nottingham, Peterborough, Plymouth, Redhill, St Albans, Witham and York.

## Short Description

### *The University of Hertfordshire Student Forum*

*Faber Maunsell AECOM were appointed by 'The University of Hertfordshire Student Forum' project to help create the campus' primary entertainment hub and meeting place for up to 2000 people. The facilities include two acoustically isolated nightclubs and a main auditorium for staging visiting music bands.*
*The building comprises a 3 storey RC flat slab structure. There are 24 m long Westok cellular beams with a 160 mm composite deck over the main auditorium to minimise noise leakage. Architecturally expressed glulam beams and columns are utilised with the main foyer and restaurants spaces. Ground conditions comprise of highly weathered chalk which had been subject to historical shallow mine workings.*

## Project Information

Owner: University of Hertfordshire
Architect: RMJM
General Contractor: Willmott Dixon Construction
**Engineering Office**: Faber Maunsell AECOM

Construction Start: 09/2007
Construction End: 09/2009
Location: Hatfield, Hertfordshire, United Kingdom

Faber Maunsell AECOM has worked for the University of Hertfordshire on a number of occasions in collaboration with RMJM Architects. The University had an existing Student Union facility which was housed within a relatively small masonry building. A separate building was used for the hosting of visiting music bands and their nightclub.

The key drivers for the project are:

- The existing infrastructure is inadequate to deal with the growing student base
- A growing demand for 'high street' feel by student market
- The changing demographics of the student market population
- Competitive pressure from other universities
- To maintain standards in line with other physical developments on the University's campuses.

The University, in order to address the issues listed above, has set the following strategic objectives:

- The Student Forum will create critical mass on campus and with the ability to accommodate 2.000 attendees at any one time
- The Student Forum will appeal to students from the deHavilland and College Lane campuses as the primary entertainment hub and meeting place
- This development will enable the University to compete for students and enhance its offering in relation to the quality of life for students.

The entire Student Forum Project comprises the following:

- The Student Forum building comprising a range of catering and entertainment venues
- Day nursery
- Multi storey car park
- New vehicular entrance to the campus
- Bus interchange
- New pedestrian square
- Facilities for the University of Hertfordshire's Student Union
- Landscaping works

The ground floor of the building houses the entrance foyer space, coffee bar, restaurant and retail area. The spaces over the foyer and restaurant are double height voids framed in exposed glulam columns and beams. The first floor then provides the main auditorium, an acoustically isolated nightclub and box office. The second floor houses an upper auditorium, overlooking the main auditorium, and also provides a second acoustically isolated nightclub. The third floor is for the provision of a plant room.

The central portion of the Forum building comprises a 3 storey RC flat slab with in-situ RC lift shafts and stair cores. The front elevation of the building cantilevers 3 m from the last column line at both first and second floor level. Due to the use of the building there are numerous changes within the levels of the slabs that necessitate the introduction of RC beams.

Used software: Scia Engineer

# The University of Hertfordshire, Student Forum



As the building can accommodate 2000 students this is a relatively highly serviced building. This required the introduction of a 50 tonne water tank within the second floor plant room.

The first floor nightclub needed to be a column free space. Additionally there is an acoustic requirement to limit the noise leakage from the building which is achieved by a 160 mm thick RC composite slab. To support the roof slab twelve 24 m long Westok cellular beams, spaced at 3 m centres, were provided over the main auditorium. These in turn are supported by columns varying in height from 9.5 m to 12.5 m. The variation in column height is required to form the sloping roof profile as defined by the Architect. Due to the stepped nature of the roofs, the main contractor actually has to build the steelwork which springs from the third floor slab first and then work down the building.

Within Scia Engineer the RC slabs and cores were designed using the FE package for both gravity and lateral loads. The steelwork was designed utilising the steelwork module.

The ground conditions within the site comprise highly weathered chalk. Typically the chalk head was 2-3 m below existing ground level. There was evidence of historical shallow mining within the chalk. Chalk had been mined in the local area for agricultural reasons. A thorough investigation of the site was performed by the use of cone penetration tests located at every column location. This showed two areas were the depth to the chalk suddenly dropped to around 9 m below ground level. Further cone penetration tests were performed at these locations to enhance our knowledge of the chalk profile and enable a contour plot to be produced. Being able to extract accurate foundation loads from Scia Engineer enabled the pile lengths at each pile cap to be optimised.