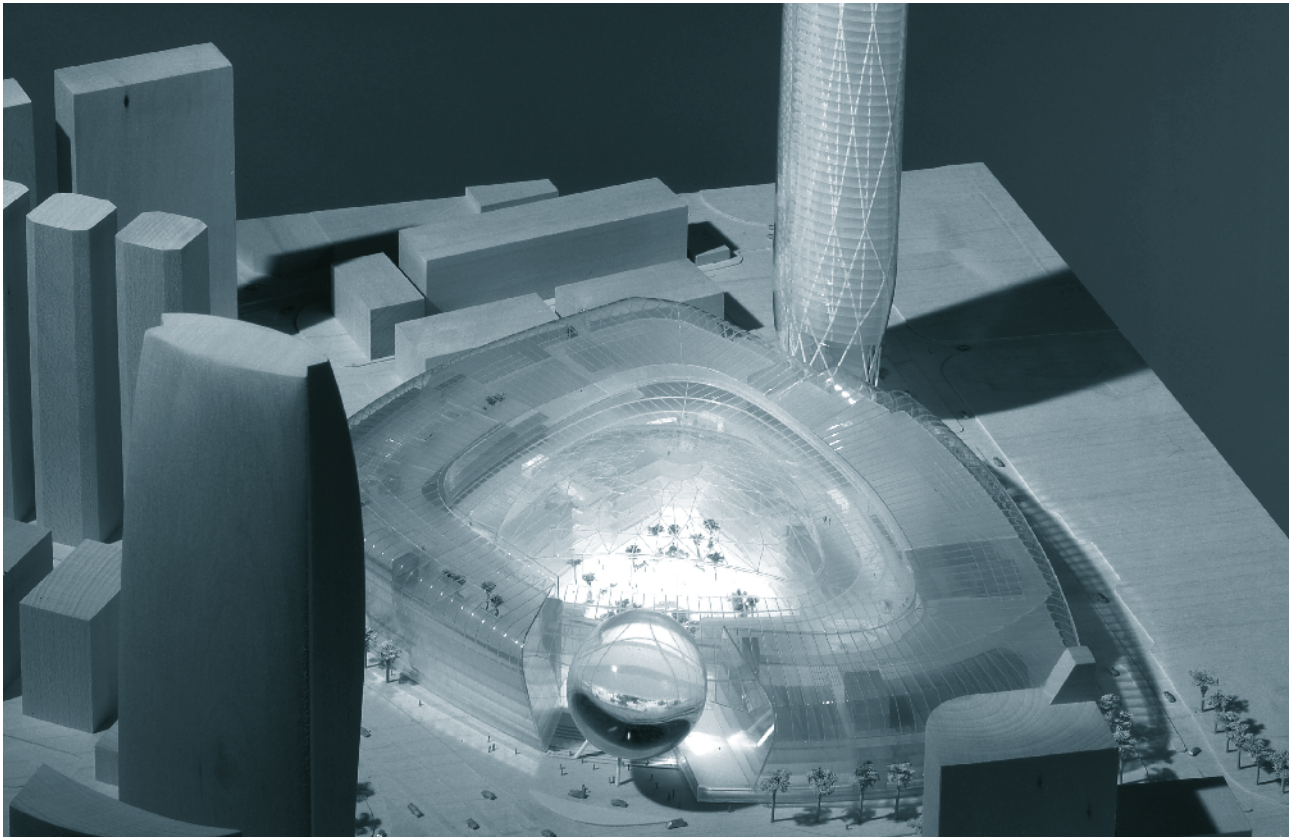


CASE STUDY



AL ASIMA - KUWAIT CITY | MIXED USE

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Al Asima is a truly landmark development that is remarkable not simply because of its considerable size and scope but also because it is the iconic central scheme in the regeneration of Kuwait City. The development has seen the creation of two buildings on top of a large podium and comprises a 75-storey office tower, a mixed-use podium up to six levels which includes public spaces, retail units, leisure outlets and underground parking with six levels of managed executive apartments above the retail/leisure floors. A mid-rise building comprises a shopping mall (including large open atrium), multi-screen cinema and basement parking. Developing and justifying a fire strategy for this ambitious project was extremely complex and, as globally-recognised experts, FDS Consult was brought in to design the fire strategy and carry out Computational Fluid Dynamics (CFD) modelling analysis to demonstrate that the company's innovative approach would deliver high levels of safety.

To define the fire strategy, FDS Consult followed the British and US standards and regulations, utilising the company's creative approach to fire design alongside these guidelines where it was advantageous to do so. The project involved numerous challenges including the scale and mixed use nature of the scheme and resulting occupancy levels, the need to work outside local design codes and educate the Kuwaiti authorities regarding CFD, fire engineering and various architectural features such as the high rise tower and the large atrium.

To address these challenges, FDS Consult worked closely with the project's design team and the client using the company's expertise to:

- Develop a method of suppression control in the retail/atrium areas involving sprinkler trees that incorporated the light requirements to allow free and flexible use of the space
- Increase evacuation time and improve fire fighting access in the retail/atrium areas by utilising a system of fixed shop frontages to allow a smoke control system to be incorporated into the back of the units to maintain a clear layer height
- Provide cost efficiencies by specifying a smoke control system with a dual purpose as the day-to-day ventilation system
- Specify the most efficient smoke control system for the vast underground car park, implementing a zoned smoke control system (impulse jet fan) to achieve high levels of safety despite the large travel distances
- Justify the removal of one of the four stair cores originally specified for the high rise tower by developing a smoke control strategy for the stairways and office floors that demonstrated that the remaining three staircases would

not be compromised by smoke. This strategy included the provision of safe havens for transition between staircases and holding points to reduce stairway congestion.

Due to the mixed use nature of the building, FDS Consult employed a phased evacuation protocol throughout the development. The local authorities had particular concerns about the evacuation of the office tower and adherence to local codes would have jeopardised the viability of this element of the scheme as the inclusion of four stair cores would have made the building spatially inefficient. FDS Consult's expertise in using CFD modelling to demonstrate the efficacy of the fire systems specified, the viability of the evacuation strategy proposed and the behavior of fire and smoke was critical to justifying FDS Consult's innovative approach to fire engineering the building.

The phased evacuation protocol introduced by FDS Consult was based on the team's proven experience and ensures safe, efficient and simple-to-manage evacuation. The evacuation strategy included:

- A means of escape design that provided alternative evacuation routes for occupants of the non-retail zones so that in most scenarios they did not have to be evacuated through the retail space
- A lobby-protected design for each of the cinema auditoria along with a secondary escape independent of the atrium, which allows occupants to be evacuated through the atrium in the event of a fire in one of the auditoria or away from the atrium in the event of a fire in the retail space

The fire strategy also had to consider access for firefighting crews and water supply. As a result FDS Consult specified:

- The inclusion of seven main, 120-minute fire-rated firefighting cores, including wet riser outlets and firefighting lifts
- A fire service control centre, including provision to manage evacuation and firefighting operations

FDS Consult's experienced team was able to justify extended travel distances, which in some areas were double the code requirement, and reduce the smoke venting specification by using CFD modelling to demonstrate the spread of smoke and fire. This assisted the local authorities in understanding the potential smoke development, which, in turn, allowed the design team to adopt a solutions-driven approach outside of the strict confines of the code and thereby achieve a cost effective and spatially efficient building.

