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PHOENICS Case Study: Fire Wembley Stadium Fire Study

This international sporting icon has been redeveloped to uphold its unrivalled status as a unique venue well into the 21st century. A comprehensive fire-engineering review was undertaken by Australian consulting firm, Connell Wagner, with the aid of PHOENICS, to ensure compliance with Building Regulations and conformance to UK Green Guide principles for sports stadia.



Substantial CFD modelling was undertaken, in support of the fire engineering

review, to demonstrate compliance with performance regulations. Use of passive architectural measures, as opposed to mechanical smoke management systems, was a key design requirement as they provide greatest reliability as well as lowest cost.

An unusual feature of this stadium is that it incorporates an underground service “ring road” below the pitch arena, primarily for access and parking facilities for service and outside broadcast (OB) vehicles. The area is similar to a road tunnel and an effective mechanical smoke extraction system needs to be designed to meet regulatory requirements.

Fires up to 35MW were considered and assumed to occur within an OB, or similar, vehicle. Various case scenarios were considered, including different fire locations and sizes, varying mechanical extraction rates, and with or without the influence of an activated sprinkler system.

Results from the CFD analysis were used to ensure the mechanical extraction system satisfied the criteria of indefinite tenability beyond 60m either side of the fire location and below a vertical height of 2m for temperature and smoke.

For a more detailed report on the Wembley sports stadium, and other applications modelled using PHOENICS, click on: <http://www.cham.co>.

