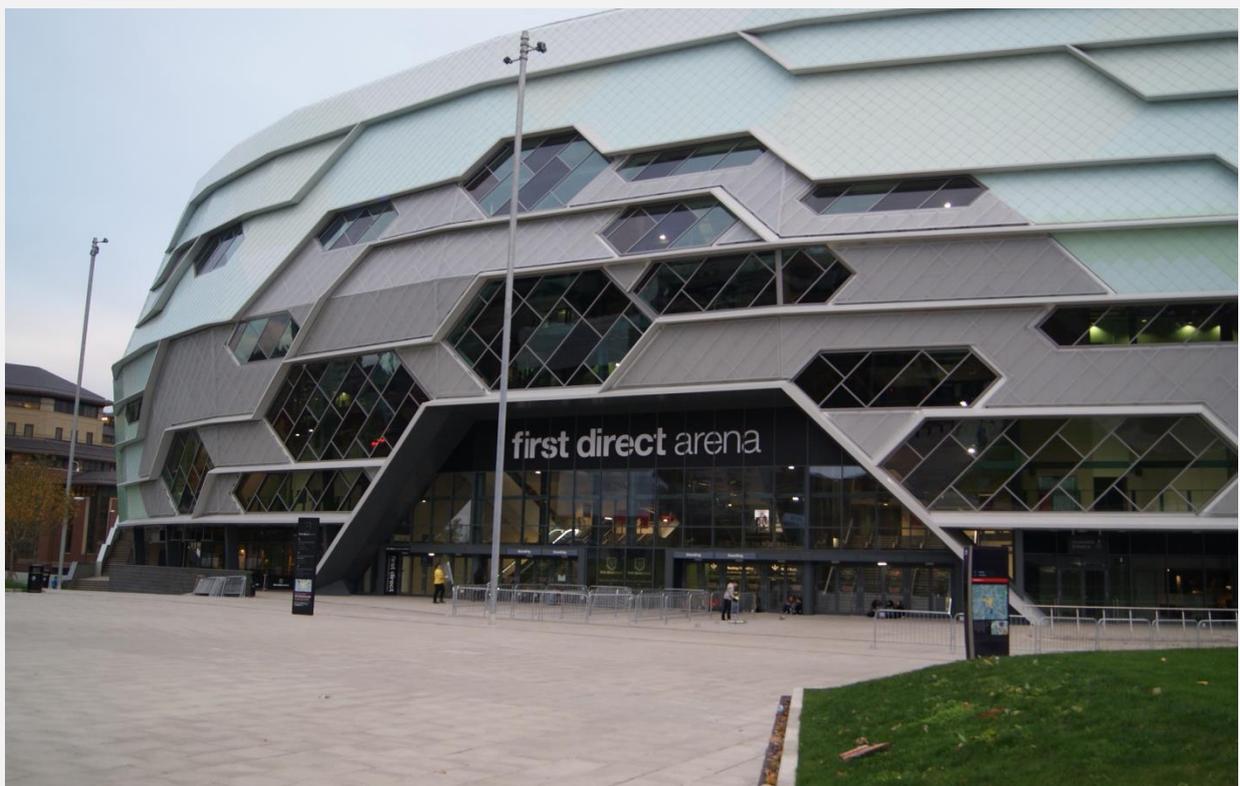


## Leeds Arena

Complete	Area	Client	Architect
2013	UK England	Leeds City Council	Populous (Design) Holmes Miller (Technical Adviser)

Leeds Arena is a major entertainment venue for live music, comedy, entertainment shows and sporting events. The arena has a capacity of 12,500 when fully seated which can be increased to 13,500 with partial standing or reduced to 1,500 for smaller shows.

The Arena's unique theatre style configuration is designed to enhance the arena experience, with all seats facing the stage. A busy city centre location meant that control of noise egress to neighbouring residential buildings was a key consideration.



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## Services provided

Sandy Brown acted as technical advisers on behalf of Leeds City Council from Detailed Design to Completion. Services included reviewing the contractor's proposals and agreeing on the acoustic performance requirements to be achieved, reviews of technical submissions, site monitoring and witnessing of commissioning. Main design features included consideration of:

- noise egress to adjacent residences from amplified events
- control of noise from deliveries and loading activities
- room acoustic requirements for the arena
- noise control of externally mounted plant.

## Special acoustic features

The design of the external envelope in terms of acoustic performance was a key design consideration on this project. The theatre style layout meant that there was no continuous concourse area around the perimeter of the auditorium, which would usefully provide an acoustic buffer zone and would allow a lower performance external facade. In addition, the proximity of noise sensitive receivers – the nearest of which was a student residence – was particularly close to the service yard and stage house walls. A twin leaf design using a combination of heavy masonry and a drywall leaf construction was tested and adopted by the contractor. The roof construction consisted of a concrete outer layer with a large cavity below and multi-layered plasterboard inner ceiling.

The wall around the proscenium truss had a high acoustic performance requirement as it was close to the main sources of noise within the arena and the adjacent student residential building. The structure of this wall was further complicated as the 12 large ventilation ducts used to serve the auditorium are connected to six air handling units (AHUs) that penetrate this wall. Maintaining the performance despite these penetrations was considered as part of the acoustic design and effective sealing solutions detailed.

The objective was for the auditorium to provide a venue for concerts, family entertainment and multi-media events, meaning its primary function was directly affected by the acoustic quality of the space. Due to the scale of the venue, all events rely on amplified sound. The primary room acoustic requirements were therefore control of reverberation and avoidance of acoustic defects.