

## LFC Anfield Stadium

Complete	Area	Client	Architect
2016	UK England	Liverpool Football Club	KSS Group

Anfield has been the home turf of Liverpool Football Club since their formation in 1892.

In 2014 a project began to expand the main stand and increase the ground's capacity from 45,276 to 54,000. This development makes the new main stand one of the tallest single stands in England.



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## Services provided

Sandy Brown was employed by the contractor to provide acoustic design strategy and specifications in relation to:

- acoustic performance of the building envelope including noise ingress, flanking sound transmission and self-noise
- internal sound insulation including airborne and impact sound insulation of floors and airborne sound insulation of partitions
- room acoustics and finishes
- impact of public address and voice alarm designs
- environmental noise egress
- building services noise and vibration.

## Special acoustic features

Anfield is famous for the atmosphere within the ground and our major acoustic aim was to maintain the 'Anfield roar'.

The atmosphere in the stadium is equally important to players and fans and this required our acoustic design to achieve the best balance of crowd noise on the terraces and reflection of crowd noise on to the pitch. One of the main features affecting this is the design of the roof, with the proposed materials, shape and form all impacting the acoustics within the stadium.

By building a 3D acoustic model of the stadium we were able to compare the sound level difference between the existing stand and the proposed development when the stand was fully occupied. This meant that the change in noise level generated by fans could then be calculated. The model also showed how the shape of the roof would reflect this increased level of crowd noise onto the pitch and around the terraces.

As well as making sure that the stadium's atmosphere creates a feeling of excitement for the players and spectators, the amount of noise break-out and performance of the sound system, particularly when used in emergencies, needed to be considered. Particularly in relation to the intelligibility of the public address and voice alarm systems, this again required achieving a careful balance as while the amount of sound absorption aids speech intelligibility, it also reduces crowd noise. This meant that incorporating sound absorbent treatments on the roof of the stand would reduce reflections off the roof, reducing the reverberation and subsequent noise build-up.