



O₂ Arena Case Study

ROCKWOOL®

FACT FILE

Location
London, UK

Year
?

Architect
HOK Sport Architecture

Constructor
Sir Robert McAlpine

Engineering and Installation
WWR Group Ltd

Segment/building use
Music venue

The challenge

The design of the O₂ arena's roof had to incorporate state-of-the-art acoustic engineering to eliminate virtually all nuisance ambient noise (bass thumping) outside the arena while ensuring as near perfect acoustics as possible inside the structure.

This means that local residents and visitors to the surrounding shops and leisure complex are not be disturbed by events in the arena.

The complex roof design featured several layers of different density barrier materials to deaden even the lowest bass frequencies, all carried on special acoustic deck structures. An added challenge was that the roof had to be built up at ground level and then jacked into place, four metres under the existing fabric roof.

BENEFITS

- The largest purpose built music venue in Europe
- Venue for the 2012 Olympic basketball
- The roof structure weighs 4,500 tonnes
- Eliminates ambient noise outside the arena
- Creates near perfect acoustics inside

ROCKWOOL® solution

Fully perforated aluminium acoustic trays were filled with ROCKWOOL® RW6 insulation, cut to profile and faced with black tissue and supported on 200mm Rigidal structural deck. The structural deck troughs were filled with ROCKWOOL® RW4 insulation, with ROCKWOOL® Acoustic membrane over and a 50mm Rigidal intermediate deck. 150mm of ROCKWOOL® Dual Density HardRock insulation board, in two layers, was used to provide the main insulation, which was overlaid with a Sarna UK Ltd separation fleece and PVC roof membrane. The compound curve of the perimeter of the roof was

then completed with 5m diameter aluminium faced composite panels from Euroclad, which was fixed to a secondary frame. Structural integrity during and after the lift was ensured with SFS intec fasteners.

The 15,000m² domed roof has a 650m perimeter with a saddle shape to create an undulating roof line. After the two stage lift on the four end towers, the O₂ arena roof finished four metres below the PTFE coated glass fibre fabric of the O₂ domed roof.

“We worked with ROCKWOOL® right from the design stage of the project to model the structure to meet the architect’s specifications. A mix of different ROCKWOOL® acoustic insulation products has been used within the roof design to cover a wide audible frequency range and achieve optimum levels of acoustic performance.”

Gary Creaser, Managing Director, WWR Group Ltd
