

Case study

# Optimum acoustic performance at the O2

O2 Arena, London





## The challenge

The design of the O2 Arena's roof incorporates state-of-the-art acoustic engineering that eliminates virtually all nuisance, ambient noise (bass thumping) outside the arena, contributing to fantastic acoustics inside the structure.

The roof design ensures that local residents and visitors to the surrounding shops and leisure complex are not disturbed by events in the arena.

The complex roof design features 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.





## The solution

Fully perforated aluminium acoustic trays were filled with ROCKWOOL® RW6 insulation, cut to profile, 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 HardRock® (DD) 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, and then fixed to a secondary frame. Structural integrity during and after the lift was ensured with SFS intec fasteners.

The 15,000m<sup>2</sup> 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 finishes four metres below the PTFE coated glass fibre fabric of the O2 domed roof.

“We worked with ROCKWOOL 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 were used within the roof design to cover a wide audible frequency range and achieve the required acoustic performance.”

Gary Creaser  
Managing Director  
WWR Group Ltd

