

## Project Profile: Freeman's Quay Pool & Leisure Center, Durham, UK

**Project:** New multi-use facility including sports hall and aquatic center

**Solution:** Xtralite's structural glazing incorporating Lumira® aerogel technology is a key element in Wm Saunders Partnership LLP's design of the wholly contemporary Freeman's Quay Swimming Pool and Leisure Center, set below Durham's iconic cathedral in Durham County.



Project architect, Andrew Bottomley, explained the design concept as follows: 'The basic plan is informed by an ammonite, linking to the proud coal mining tradition of the region. A curved wall descends from the back of the site, at its highest point, down into the heart of the building, and ending at the reception desk.'

The complex consists of different activity spaces and is surmounted by a distinctive roofscape, incorporating a variety of long barrel-vaulted Xtralite rooflights, some including opening vents. Glazing is multiwall polycarbonate filled with Lumira® aerogel, to provide enhanced thermal and acoustic performance as well as high levels of diffuse daylighting.

The building fabric contains 50% higher insulation values in the pool hall than those required by building regulations and 25% higher in all other areas. The center has been designed to maximize natural light and employs some of the most advanced building techniques and materials to accomplish this. Daylight modeling was conducted on the main pool, learner pool, fitness suite and sports hall to ensure the required light levels were achieved throughout the day without the aid of artificial lighting. The design and orientation of the glass in the pool hall prevents glare and direct sunlight on the water's surface while maintaining an incredible quality of natural light. All areas with effective daylight have been provided with automatic daylight switches allowing light sensors to activate luminaires at programmed light levels.

Andy Johnson of Max Fordham Consulting Engineers said: 'We looked into the energy savings achieved through enhanced daylight and calculated that switching the lights off during daylight hours would save 53,000kg (53mt) of CO<sub>2</sub> annually. This does not include beneficial solar gain to the pool hall which will supplement the savings even further. Moreover, the improved U-values over conventional rooflights bring the carbon cost of the heat loss down from 18,000kg (18mt) CO<sub>2</sub> to just 11,000kg (11mt) CO<sub>2</sub> annually. The Lumira® aerogel rooflights therefore make an important contribution to the energy performance of the building.'

'But I think that the quality of light is even more important. The light entering the space is diffuse and will reduce glare problems. In the sports hall, we were very concerned with glare for people playing badminton and originally intended to add baffles to the rooflights to minimize the glare, although these proved unnecessary with the Lumira® aerogel. In the pool halls, minimizing glare and reflections off the pool water is also of vital importance. The architects and I are very happy with the feel of the spaces lit with Lumira® aerogel rooflights and I think the diffuse light works particularly well,' said Andy Johnson of Max Fordham.

**Architect:**

Wm Saunders Partnership, LLP

**Engineer:**

Max Fordham Consulting Engineers

**Lumira® aerogel partner:**

