The gull-wing roof of the hotel’s pavilion links it with the Winter Gardens on the left. Lightweight panels faced with Stanton Moor stone.

Stanton Moor sandstone from Derbyshire went to Stone Panels in America to be applied to an aluminium honeycomb backing and reduced to 8mm thickness to create the lightweight cladding that has been used in conjunction with Protec lightweight steel framing, structural glass and metal decoration to create a new landmark building, the Macdonald St Paul’s Hotel, in the centre of Sheffield.
Lightweight aluminium honeycomb panels faced with ultra-thin Stanton Moor sandstone fixed on a lightweight steel frame. That’s the solution used to satisfy planners’ and architects’ desire to use the local stone for the new 15,000m², 156-bed Macdonald St Paul’s Hotel sandwiched between the modern Winter Garden and the Grade I listed late 19th century Town Hall in the centre of Sheffield.

It was a solution achieved by Brickworks UK Ltd in conjunction with stone specialists Stoneguard, who bought the assets of lightweight steel frame company Protec in Byfleet, Surrey, in 2003. This was the first time the system had been used with lightweight stone panels and the first time the panels had been made using English sandstone.

The stone, quarried in Derbyshire by Stancliffe, made its way across the M1 to Sheffield via Dallas, Texas, where it was sawn into thin section veneer on an aluminium honeycomb backing by Stone Panels, the company that makes the panels and who are represented in the UK by BrickWorks UK Ltd in Newark, Nottinghamshire.

The 70 tonnes of stone were shipped to Stone Panels in three containers as scants 2m x 2.2m at 70mm thick and came back as 1,300 lightweight panels. The majority of them were 932mm x 516mm x 26mm thick and fitted in just one container. The aluminium honeycomb backing makes up most of the thickness of the panels, with the stone at just 8mm.

That provided the external cladding for about 600m² of the hotel’s walls, with cladding for the project’s 23 columns arriving later. The stone has been used in conjunction with frameless floor-to-ceiling height structural glass and metal features.
There are 10km of lightweight framing rails supporting the cladding and colonnade soffit panels and there are 41,000 fixings holding the Protec system and its stone panels in place.

The lightweight stone panels on the Sheffield Hotel weighed 16kg/m². Solid stone cladding would have weighed at least 10 times more.

Lightweight stone panels are not a cheap alternative to more traditional 50-75mm stone cladding. On the contrary, per square metre they are more expensive. Including the lightweight steel frame that holds the panels, the walling in Sheffield cost about £340/m², says Malcolm Barratt, Stoneguard’s estimating director, whereas fixing 50mm Stanton Moor cladding would have produced a wall costing about £250/m².

Of course, the price of a finished wall in lightweight panels varies enormously depending on the design and especially elements such as factory-made corners and returns, which are essential to create the appearance of a solid stone wall.

However, reducing the weight of a building has structural implications that can produce considerable savings – as long as they are taken into consideration at the design stage.

As with any stonework, it is always a good idea to talk to the stone contractor at an early stage to maximise the advantages of using the material in whatever form it comes and minimising the cost.

In Sheffield, where Brickworks UK and Stoneguard were involved at an early stage, the light weight of the frame and cladding meant piling was reduced and the concrete frame was lighter than it would have needed to have been to support solid stone. That alone represented a considerable saving in time and money. And because the stone panels could be lifted safely by one person, there was no need for a tower crane to lift the stone up on to the scaffold, nor runner beams and loading bays on the scaffolding.

Stoneguard director Nic Constantine says that because of such savings, on a £60million project they have just quoted for in Manchester there is an overall saving on the project of £1.1 million resulting from the specification of the lightweight frame and cladding. In Sheffield, the construction cost of the whole building came out at a modest £1,600/m².

Andy Warmsley, the design director of Bowmer & Kirkland, design-and-build contractors on the Sheffield hotel, says: “We didn’t have any problem with the price of the system as it stood. I would consider using it again.”

Mike Fletcher, Stoneguard’s project manager, suggested using the Protec lightweight panel system in conjunction with the stone panels. The combination saw the cladding going on to the building at a rate of knots. Mike says that as the fixers became used to the system the time it took them to attach each panel came down to just 5½ minutes. That went down well on site because space was limited and it meant the panels were arriving and going straight on the walls rather than taking up space on a tight site with not much space for storage.

The building was already watertight before the cladding started to go up, so the cladding was not on the critical path. Nevertheless, Andy Warmsley admits he was impressed by the speed at which it was fixed.

And in spite of the panels coming all the way from America, the turnaround time from sourcing the stone to receiving the panels was just 20 weeks.

The project architect was Stephen Nicholls from the Street Design Partnership in Manchester. He told NSS that it had become clear early on that the planners expected stone to be used and they expected it to match the stone that had been used by E W Mountford for the adjacent Town Hall, built in the final decade of the 19th century.

“The end result is just what everyone wanted,” says...
the architect. “The person in the street won’t realise it’s only a veneer.”

It is not, in fact, quite what everyone wanted. There were a lot of people who did not want anything to block the view of the new Winter Garden and the old Town Hall. However, Stephen Nicholls says: “Now we’ve finished, people are finally coming round to the idea of thinking it’s not so bad after all.”

For Stoneguard, this was only the second time they had used lightweight stone panels externally, the first time being four years ago. However, Malcolm Barratt says they are currently working on a third such project in London, have priced 30 more and are dealing with about 17 new enquiries for it. “It’s definitely taking off,” he says.

Paul Griffiths of BrickWorks UK, representing Stone Panels in the UK, adds: “It’s like any product: you put a lot of effort in to start with, have a lot of disappointments, then as interest and confidence in the product grow the enquiries begin to come in.”

With a dozen buildings in England now having used lightweight stone panel cladding or being in the process of doing so, the barriers seem to be coming down. That has been helped by Stone Panels Inc in America investing $1 million in worldwide independent testing.

“When you have a meeting with someone and show them the panels they warm to this material,” says Malcolm Barrett.

For the Sheffield project, representatives of the main contractors and project architects visited Stone Panels’ factory in Texas to see for themselves the quality of the manufacturing process.

For the concept architect, Mark Weintraub, from the London practice that bears his name, the main consideration for the Macdonald hotel was to marry together the elements of the surrounding landmark architecture of the Town Hall, the distinctly modern Winter Garden designed by another London practice, Pringle Richards Sharratt, the award-winning Peace Garden and a new Millennium Square still being built next to it.

The Stanton Moor veneer on the lightweight panels on three elevations of the new hotel pays tribute to the Town Hall that was built in the same stone. The fourth elevation that faces the Winter Garden respects that structure with steel and glass and is linked to it by a gull-winged pavilion that contains restaurants, bars and a 12m high atrium at either end.

The Peace Garden uses Crosland Hill gritstone from Johnsons Wellfield Quarries (among other stones) for hard landscaping, and Crosland Hill stone has also been used for paving through the collonade of the new hotel with its 4.5m high columns.

Crosland Hill stone is also being used for Millennium Square along with Portuguese granite (and it is Portuguese rather than Chinese because it was felt it would have taken too long to get Chinese granite into the country).

The hotel also incorporates a stone, glass and metal tower that is a contemporary interpretation of the spires and turrets of the Town Hall. It contains an observation lift that overlooks Peace Gardens.

In this way the new hotel sits comfortably in its surroundings, complementing the neighbouring buildings and landscapes while nevertheless becoming a landmark building itself.

**Credits**

**Clients:**
- Macdonald Hotels

**Concept architect:**
- Weintraub Associates

**Project architects:**
- Street Design Partnership

**Main contractors:**
- Bovmer & Kirkland

**Stone specialists and European agents for Stone Panels:**
- Brick-Works UK Ltd

**Specialist stone contractors:**
- Stoneguard

**Stone suppliers:**
- Stancliffe

**Stone used:**
- Stanton Moor sandstone

There are 23 columns clad in the Stanton Moor lightweight stone panels and paved with Crosland Hill gritstone.

The front of the Macdonald Hotel and the side facing the Town Hall.