SURGICAL PROCEDURE

Transformation of Edinburgh's 18th century Old High School required a deft touch and awareness of the need to deliver a low carbon building, writes **Ellis Woodman**

Pictures by Dave Morris

The southern extension provides the building with an orientation to Surgeon's Square.

Alma mater of such Scottish Enlightenment luminaries as Walter Scott and Robert Dundas, the Old High School of Edinburgh was completed in 1777 to designs by Alexander Laing. A severe two-storey ashlar building augmented by a Roman Doric portico, it stands in the heart of the city's Old Town, a short distance from both the Scottish Parliament and the quadrangle that Robert Adam designed for the city's university.

Today, those relationships make for an address of enviable centrality, but in the late 18th century, the Old Town's attractions were fast being eclipsed by those of the city emerging on the far side of Princes Street Gardens. As soon as it opened the High School was confronted by the fact that an ever-expanding section of its intake was drawn from families resident in the New Town. Within 35 years it bowed to the inevitable and relocated to new premises on Calton Hill.

The subsequent life of Laing's building has been nothing if not chequered. The Royal College of Surgeons of Edinburgh had operated out of property at the rear of the site since the 17th century. Surgeon's Square, the yard that the college shared with the Old High School, was notoriously the place where Burke and Hare delivered their ill-gotten cadavers for Dr Robert Knox's dissection classes. Shortly after that unfortunate episode, Laing's building was converted into an associated surgical hospital, a change that required the construction of a large extension to its rear.

By the beginning of the 20th century the building had come into the hands of Edinburgh University. There followed a somewhat improbable adaptation to accommodate the engineering department — a scheme that involved the introduction of a steel-framed crane capable of carrying heavy machinery down the full length of the plan — and in the decades since it has housed the departments of dentistry and most recently archaeology.

As of the end of last year, however, the building took on yet another incarnation as the headquarters of the Edinburgh Centre for Carbon Innovation. Established jointly by three universities — Napier, Heriot-Watt and Edinburgh — this is a venue where academics, policy-makers and businesses are invited to share their knowledge with the aim of fostering Scotland's green economy. The ECCI delivers short courses, a master's programme and regular conferences while a number of green businesses and lobby groups maintain offices there.

The principal facade of the grade A-listed Old High School.

The job of equipping the building for this new role was awarded to Malcolm Fraser Architects after a competition in which its scheme was chosen over what Fraser recalls as "some glamorous knock-it-about proposals". His firm's preference for a more self-effacing intervention reflected both the original building's grade A-listed status and the ECCI's ambitions that its home might, in itself, serve as a low carbon exemplar.

The preservation of architectural heritage and the conservation of the planet might suggest themselves as naturally aligned concerns but the Breeam assessment record indicates otherwise. When ECCI was awarded an Outstanding rating at its construction-stage assessment last year, it became the first listed building in the UK to achieve such an accolade.

The architect's success in meeting that goal was certainly aided by the fact that much of Laing's work had been erased by later hands. Historic Scotland's concerns were focused all but exclusively on the appearance of the building's primary facade, leaving Fraser free to reconfigure much of what lay behind as needed. His practice's scheme was predicated on one key act of demolition: the removal of a convoluted stair that extended between the original building and the block added behind it during its conversion to use as a hospital. By stripping this out, it became possible to refocus the building around a central atrium that extends up its full height and which all of its principal spaces address.

ECCI is the first listed building in the UK to achieve Breeam Outstanding

A new laterally distributed stair negotiates more elegantly than its predecessor the mismatch between the levels of the two-storey front block and the three-storey wing to the rear. As with all the new structural work, this is made of cross laminated timber (CLT). The Finnforest product employed didn't readily allow the laminations of the structural members to follow a consistent vertical orientation and so 18mm CLT panels have been applied to the face of the beams to achieve the desired effect.

Baffles designed to filter the light falling from a skylight that runs the atrium's length and a column that supports the first floor landing also present unfinished CLT surfaces: choices that emphasise a distinction between the new work and the host building, where joinery is painted. Yet the room's ultimate effect is notably more suave than the quasi-brutalist aesthetic that governs such recent CLT-structured interiors as Dow Jones' Garden Museum or dRMM's Tower of Love.

The use of Douglas fir to form both the stair's profiled handrail and the open jointed surface of its acoustic ceiling makes an important contribution in this respect.

The atrium not only connects the 18th and 19th century parts of the building but also two new additions, distributed to either side. These adopt a common language, based on the use of a stone base and bronze-faced upper section. The stone is the same Fife-quarried Cullalo from which the original building was built and as there, each individual stone has been "broached" — its central surface tooled horizontally while a flush border has been maintained around the edge. In time, these surfaces should darken to a similar tone to that of the host building, more persuasively enforcing a reading of the complex as a single conglomerate. However, the adoption of a lightweight upper section — a characteristic feature of Fraser's work — pointedly differentiates the extensions.

On the first floor, bronze sheet has been employed in a standing seam treatment while above the same material has been folded into tightly packed corrugations. The effect is to assert a diminution of scale as the elevations rise. The choice of cladding also makes a contribution to the ECCI's environmental rating: bronze is 80% copper, offering an ideal means of recycling old electricity cables.

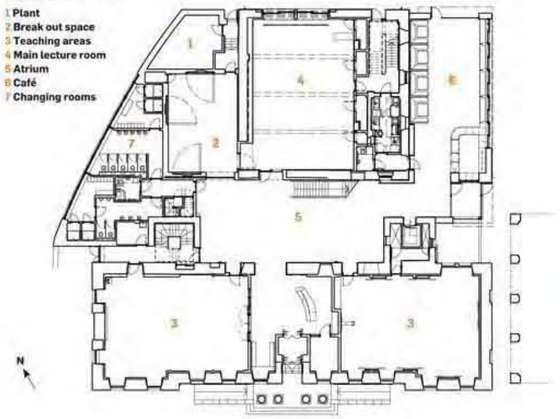
They may share a tectonic, but the expressions of the

SECTION LOOKING NORTH

1 Business development
2 Reception
3 Atrium
4 Master's hub
5 Office

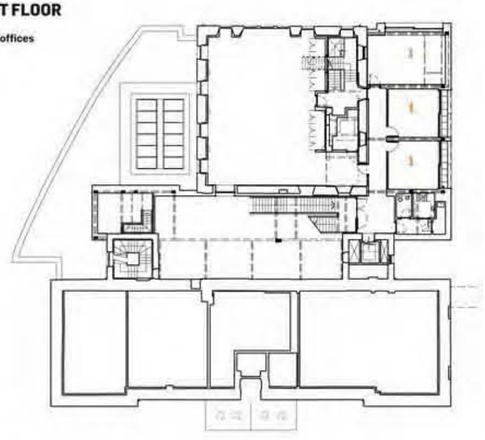
GROUND FLOOR

1 Plant
2 Break out space
3 Teaching areas
4 Main lecture room
5 Atrium
6 Café
7 Changing rooms



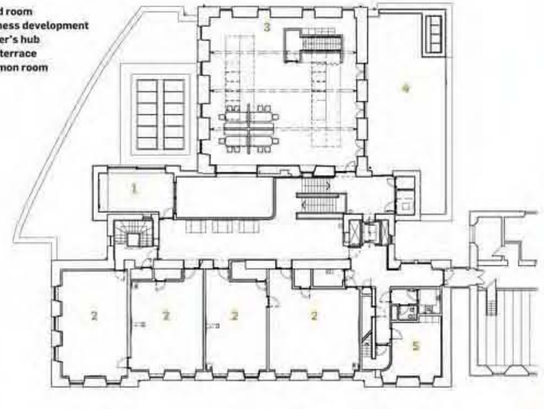
FIRST FLOOR

1 Staff offices



SECOND & THIRD FLOORS

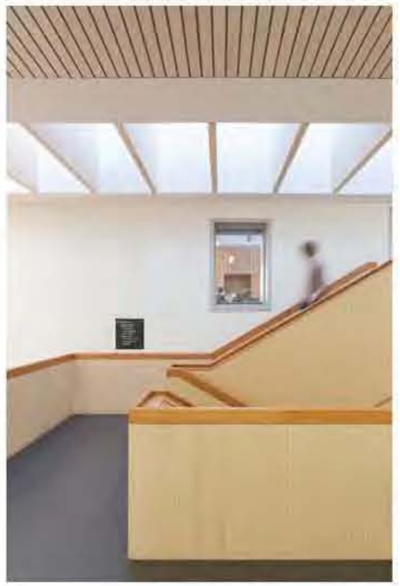
1 Board room
2 Business development
3 Master's hub
4 Roof terrace
5 Common room



A new atrium has been created at the heart of the building.

The master's hub occupies the upper floor of the 19th century extension.

CLT has been employed for the structure of the atrium staircase.



two extensions are markedly dissimilar. The one to the north houses a small meeting room on its upper level while presenting a significantly larger base-condition, much of which is given over to changing rooms for cyclists. That programme allows it to hug the curving line of the road with a wall that is windowless below head height.

The southern extension has an altogether more pavilion-like presence, reflecting its location on Surgeon's Square. Previously, this space had been reduced to a carpark for university minibuses and its rehabilitation has to be judged one of the scheme's key achievements. It has been attractively landscaped and the gates to either side are now kept open during the day. A flight of steps leading down to Cowgate is currently being reconstructed with the aim of encouraging increased pedestrian traffic.

The southern extension plays an important role in this effort by finally giving Laing's building an active frontage to the square. It houses a heavily glazed café at ground level with staff offices above and concludes with a roof terrace accessible from the large room from which the master's programme is delivered.

ECCI's director anticipates that the centre will reach full occupancy levels by the summer and expresses the hope that the university might allow him to colonise the other buildings it owns on Surgeon's Square, transforming the institution into a miniature campus.

For all the care with which its environmental impact has been restricted, the project would still have struggled to achieve its Breeam rating were it not for the fact that it is connected to the combined heat and power system by which Edinburgh University services a number of its properties in the area. Offering more heat than is needed, this system arguably obviates any need to increase the existing fabric's airtightness and insulation, but in order that the scheme might serve as a model of best practice, the existing sash windows have been upgraded with slimline double glazing units and additional insulation has been introduced throughout.

Meanwhile, a primarily passive ventilation system has been employed with displacement air and cooling being introduced only in high occupancy lecture rooms. The Breeam assessment concluded that the building's CO_2 emissions are 38% lower than they would be had the brief been accommodated in a new building designed to meet current building standards.

Not all the planned initiatives proved realisable. Rainwater harvesting had to be scaled back after the excavation for the tank revealed extensive human remains dating back to the 14th century when the site had been occupied by a monastery.

But it is exactly that constant negotiation between heritage and sustainability demands that is fundamental to the scheme's success. The architect has managed the environmental upgrading without making a drama of it and it is surely in that hard-won normality that the project's potential for influence now lies.

Rehabilitation of Surgeon's Square has been judged one of the scheme's key achievements

PROJECT TEAM

Architect
Malcolm Fraser Architects
Client
University of Edinburgh
Structural engineer
Elliott & Company
M&E consultant
Harley Haddow
Quantity surveyor
Thompson Gray
Planning supervisor
David Adamson & Partners
Acoustics
Sandy Brown Associates
Building fabric consultant
Bob Heath
Breeam assessor
Aecom
Fire engineers
FEDRA, Buro Happold
Soft landscape design
Ironside Farrar
Archaeology
Headland Archaeology
Main contractor
Graham Construction

The northern extension presents a masonry wall to the road.