

Sustainability in Practice

The brief for Sheppard Robson's Lancaster Institute for the Contemporary Arts (LICA) was clear and simple. Professor Rachel Cooper, chair of LICA, wanted it to be 'an iconic shed with flexible everything'. But in reality, LICA's new home – which accommodates administration, the Imagination Lancaster design research department, and teaching, performance and seminar space – is neither iconic nor a shed, although it is highly flexible and sustainable. Opened in October 2010, it is the first higher education building – and the second building ever – to receive a BREEAM Outstanding post-completion rating, with calculated annual CO₂ emissions of only 10.3kg per square metre. It was also built for just £1,274 per square metre, although Sheppard Robson director James Jones emphasises that it benefited from a nadir in tender prices – an incentive to add an additional floor at the eleventh hour, which has yet to be fitted out and will therefore reduce this square metre rate still further.

Fast construction, which kept main contractor Morgan Sindall's overheads low, further reduced costs, and the extensive use of engineered timber was also a major factor. Cross-laminated timber is used for walls, floors, beams and glulam columns – all European larch and responsibly sourced – which, along with LICA's low air infiltration rates and U-values, also clocked up the BREEAM points and swept it through building control. Timber subcontractor Eurban, which was responsible for design and erection but not manufacture, had worked with Sheppard Robson on Waingels College (AJS 05.10) and Norwich Open Academy (AJS 08.11), so the design team had a pool of expertise in engineered timber construction. 'The great thing about engineered timber is that you can just put a window in without lots of complicated bracketry,' says Jones. So LICA is adaptable as well as flexible, as it will need to be, because the top floor is currently a basic shell. >>



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Green education

Lancaster University's BREEAM 'Outstanding' LICA building shows Sheppard Robson's commitment to sustainable design, writes *Felix Mara*

KEY POINTS

- The cross-laminated timber structure allowed exceptional airtightness
- Calculated annual CO₂ emissions 10.3kg/m²
- BREEAM Outstanding
- Construction cost £1,274 per m²
- 10 months on site

In fact, the facility's sobriquet is 'L'ikea', a reference to its knock-down aesthetic. 'It's meant to feel raw. We wanted to be able to batter it around a bit,' says Jones. Externally, apart from clunky window frames and sometimes uncomfortable proportions, tells a different story, with timber-panelled walls sheathed by an aqueous rainscreen of ribbed polycarbonate, as seen at Herzog & de Meuron's Laban dance centre. The material is also used as an insulating, triple translucent skin for the sliding hangar doors to the double-height event/studio space, with wiper blades and seals that, remarkably, do not compromise LICA's airtightness of 3.02m³/h.m² at 50Pa. Like LICA's other double-height spaces, this facility has displacement ventilation, with three air changes per hour, and can be subdivided by folding partition, with a sound rating of 56 decibels.

Enhancing LICA's environmental performance are good daylight levels, facilities for cyclists (full BREEAM points), harvested rainwater which flushes the low water-use sanitary appliances, low-energy lighting with presence sensors, rooftop cylindrical photovoltaic modules, 75 per cent efficient heat recovery, use of the university's district heating system with on-site combined heat and power, and a composting system. 'To achieve Outstanding, the team had to target the majority of credits available,' says Hoare Lea executive engineer and accredited BREEAM professional Clare Doyle. 'The EPC of 21, high materials selection and responsible sourcing scores definitely helped boost the rating.' And because Sheppard Robson worked closely with >>

Cross-laminated timber is used for walls, columns, floors and beams

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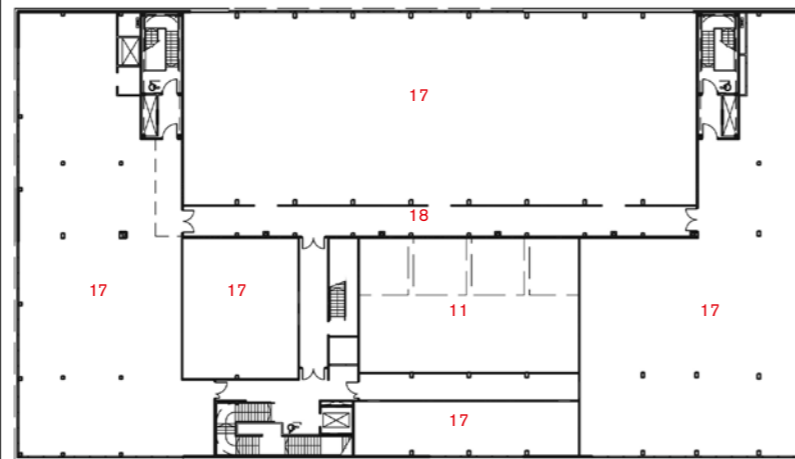
West elevation.

The appearance of the polycarbonate cladding changes under varying lighting conditions, revealing insulation behind

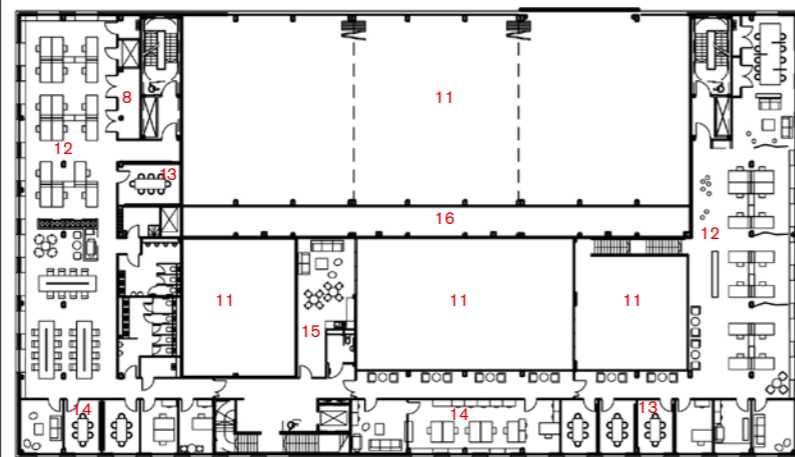
Opposite

The Imagination Laboratory is overlooked by open-plan offices

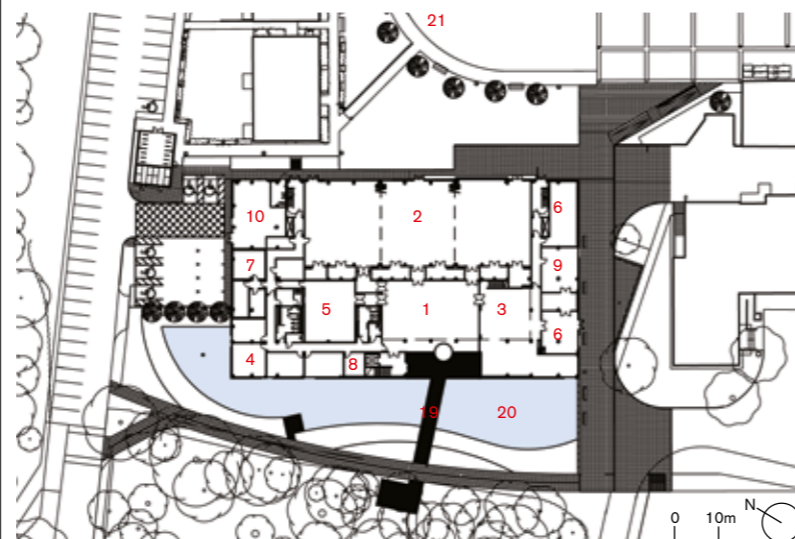
Second floor plan



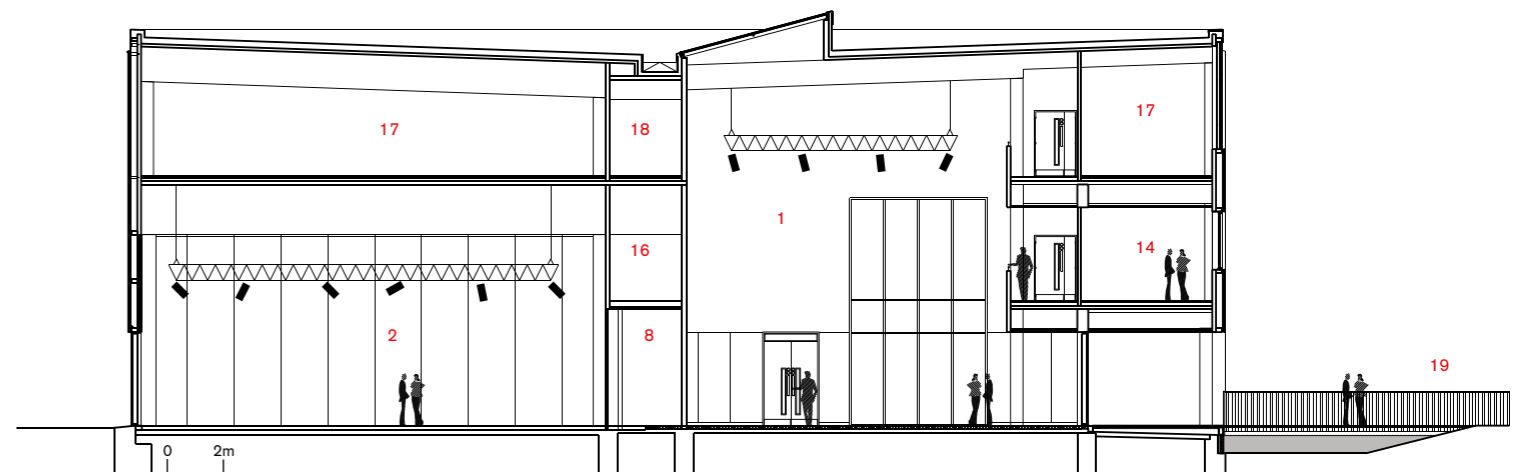
First floor plan

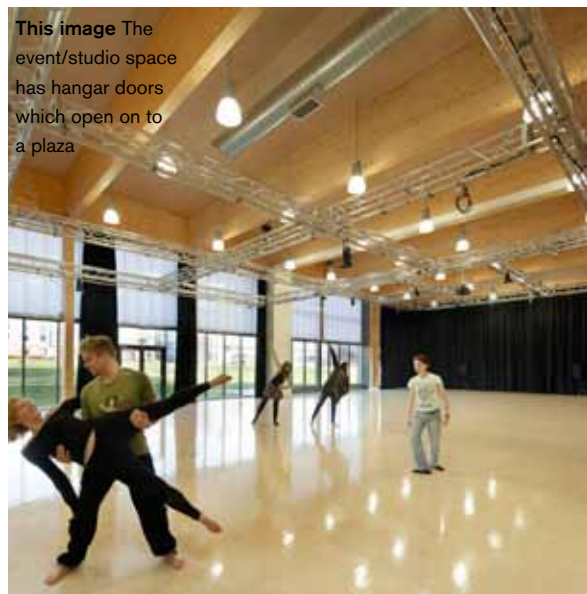


Ground floor plan



1. Entrance hall
2. Event/studio space
3. Imagination Laboratory
4. Seminar room
5. Installation space
6. Workshop
7. Practice room
8. Store
9. Studio
10. Plant
11. Void
12. Open-plan office
13. Meeting room
14. Office
15. Staff area
16. Services void
17. Future expansion space
18. Fire corridor
19. Entrance bridge
20. Pond to stop surface water run-off
21. Plaza



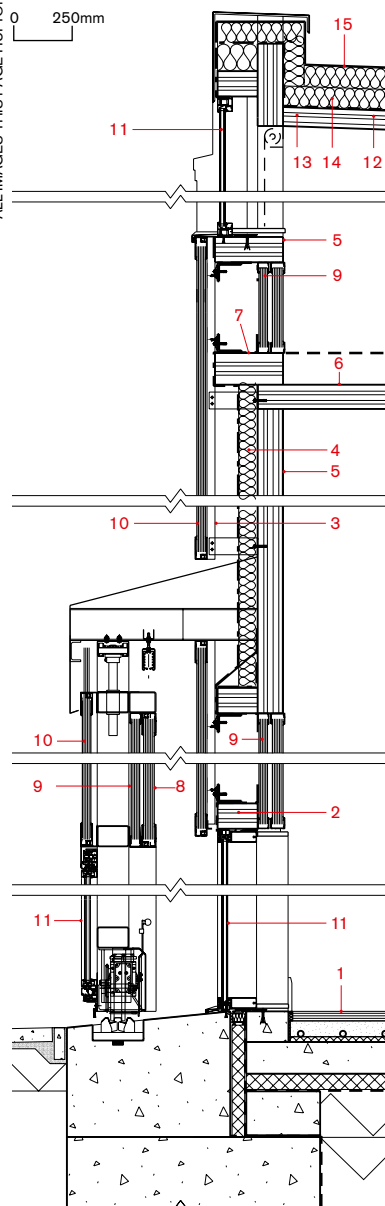


This image The event/studio space has hangar doors which open on to a plaza



Section through hangar door wall

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quantity surveyor Gardiner & Theobald, who were at almost every briefing session, there was no value engineering crisis.

‘Sustainable innovation has been integrated into Sheppard Robson’s design and business processes since the practice was founded,’ says the 70-year-old practice’s website. If nothing else, this indicates Sheppard Robson’s commitment to environmentally intelligent design. And the north London practice’s simultaneous achievements in the commercial avant-garde corner of the profession demonstrate just how good sustainable architecture can be.

If you visualise a triangle with high environmental performance, low cost and architectural quality forming its three sides, quality is the weakest link at LICA. But it is far from being a weak link. It’s not great architecture, but it is good architecture, and its plastic and balsa wood aesthetic is completely of its time. Somehow, even though LICA has a design life of 80 years and timber finishes that will become more silver with age, its tectonic components will always feel as though they’re ripe for recycling. ■ Watch a film of LICA under construction at TheAJ.co.uk/LICA

1. Gransprung area elastic floor
2. 120mm cross-laminated timber window surround/bracket
3. Rodecca aluminium rainscreen support
4. 90mm Kingspan foil-faced rainscreen board
5. 120mm cross-laminated timber wall panel
6. 115mm cross-laminated timber floor panel
7. 150mm cross-laminated timber window support/bracket
8. Rodecca 50mm polycarbonate rainscreen panel 2550-10 Opal
9. Rodecca 40mm polycarbonate rainscreen panel 2550-10 crystal
10. Rodecca 40mm polycarbonate rainscreen panel 2540-7 luna green
11. Schüco ADS 70 Hi curtain wall system
12. 90mm cross-laminated timber roof deck
13. VCL
14. 2 x 100mm Kingspan TR26 rigid insulation
15. Sika Trocal type 5 1.5mm single-ply roof membrane

Credits



START ON SITE	October 2009
CONTRACT DURATION	10 months
GROSS INTERNAL FLOOR AREA	4,930m ²
FROM OF CONTRACT	Design and Build (with novation after RIBA Stage E)
TOTAL COST	£6.3 million
COST PER SQUARE METRE	£1,274
CLIENT	Lancaster University
STRUCTURAL ENGINEER	Sinclair Knight Merz
TIMBER STRUCTURE	Eurban Construction
M&E CONSULTANT / BREEAM ASSESSOR	Hoare Lea
QUANTITY SURVEYOR	Theobald & Gardiner
LANDSCAPE CONSULTANT	Ian White Associates
ACOUSTICS CONSULTANT	AEC
PROJECT MANAGER	Christal Management
MAIN CONTRACTOR	Morgan Sindall
CDM CO-ORDINATOR	Aegis Services
APPROVED BUILDING INSPECTOR	Lancaster City Council
CALCULATED ANNUAL CO ₂ EMISSIONS	10.3kg/m ²
ENERGY PERFORMANCE CERTIFICATE	A-rating, asset rating of 21
HEATING AND HOT WATER LOAD	37.09kWh/m ² /yr
ANNUAL ELECTRICAL BASE LOAD	19.17kWh/m ²
ANNUAL IT AND SMALL POWER LOAD	20.99kWh/m ²
ON-SITE ENERGY GENERATION FROM PV CELLS/CHP	19%
AVERAGE U-VALUE FOR WALLS	0.2W/m ² K
AVERAGE U-VALUE FOR WINDOWS	1.67W/m ² K
AIRTIGHTNESS AT 50PA	3.02m ³ /h.m ²
SUMMER THERMAL TARGET FOR ENERGY REDUCTION	28°C
PREDICTED ANNUAL MAINS WATER CONSUMPTION	2m ³ /occupant
BREEAM MATERIALS SPECIFICATION RATINGS	Timber A+; windows mostly A; roof A+; upper floors A+; floor finishes mostly A+