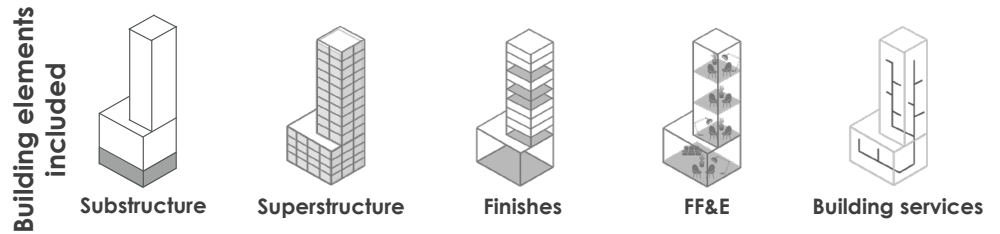
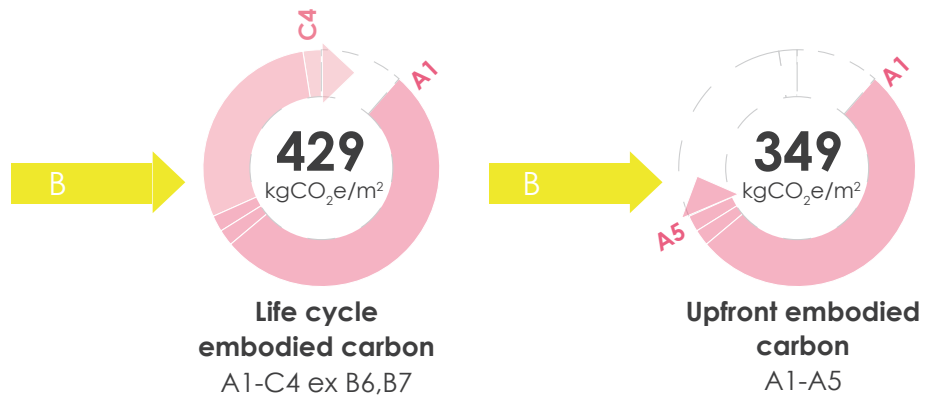
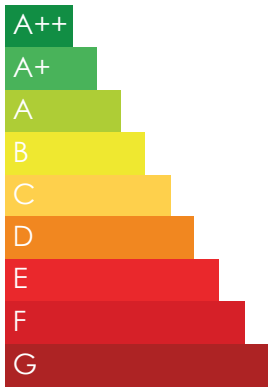


King's Cross Sports Hall by Bennetts Associates & BAM



Project overview
Community sports hall in the King's Cross development, with a temporary meanwhile use as a further education venue for a constructions skills centre.

Mass timber construction with zinc façade, very few internal finishes beyond the exposed structure (and those that do exist are durable and low-carbon).

Project sector
Education

Assessment date
2021 (at RIBA Stages 3 and 6)

RIBA work stage
7

GIA (m²)
2032 m²

Year of project completion
2020 (Complete)

Analysis
OneClick (RICS Methodology)

Database(s) used
OneClick

Type of building
New build

Ref. study period
60 years

Location
UK

Data notes
2 Storeys
Mass Timber, Zinc Rain screen



Image c. Bennetts Associates

Assessment objective

The project's initial target was to get embodied carbon as low as possible, and so assessment was undertaken to measure against that target.

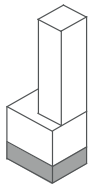
Key lessons learned

Most applicable lessons are primarily designing for future use with CLT (Cross Laminated Timber). Coordinating specifically for and with multiple end users and providing soft spots, particularly in soldier walls. Allowing for demountability via concealing panels and needing early coordination when exposing all services and service runs are also valid for other typologies.

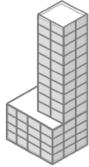
Key barriers and challenges

The Site had a number of constraints including height limitations and a tight site boundary, but most notably the project had to deal with a series of tunnels running from King's Cross station which were very close to the ground. This not only reduced the option of digging into the site or piling, but meant that weight needed to be restricted to the historic loadings and that any removal of weight had to be quickly compensated for to maintain existing loading conditions. In addition, from an operational perspective, the use of the building as a sports hall meant that whilst a mixed mode ventilation strategy is used for the sports hall in its first life, the need for controlled air movement for some sports meant that a mechanical ventilation system will be needed for its second use (though mixed mode will be available as an option).

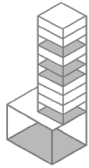
Building elements embodied carbon (A1-A5)



Substructure
65 kg CO₂e/m² (A1-A5)



Superstructure
203 kg CO₂e/m² (A1-A5)



Finishes
4.3 kg CO₂e/m² (A1-A5)



FF&E
N/A kg CO₂e/m² (A1-A5)



Building services
43 kg CO₂e/m² (A1-A5)

Success stories

The building is unusual in that having been designed to be adaptable it is already proven to be suitable for two very divergent use types. Its first life as a construction skills centre will soon give way to a longer life as a sports hall and gym, and the flexible spaces allow future changes of use beyond this. Considering the technical challenges and limitations on where and how loading could be brought to the ground made achieving this all the more difficult. One of the other key successes is the significant reduction of upfront carbon emissions due to the ultra lightweight and material efficient design, and the removal of almost all non-essential materials whilst maintaining a robust and high quality space.

Material selection

Due to the goal of ultra low upfront embodied emissions, coupled with the need for a lightweight structure, CLT (Cross Laminated Timber) was chosen as the primary material (both for walls and roof, supported by glulam beams). The finishes palette was minimised to remove all non-essential materials, and the dark zinc façade was chosen for being both lightweight and low-carbon, but also due to it complementing the timber and being able to be used on both roof and façade to support the monolithic massing that can be seen from the many surrounding taller buildings.

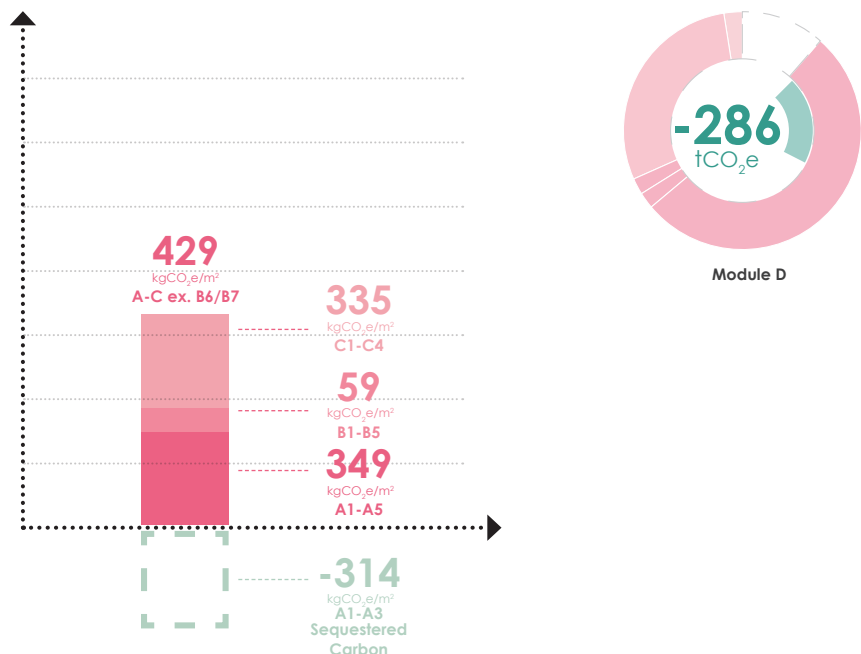
Design decision justification

Due to the site geometry dictating where the sports hall could be placed, a structural system was selected where CLT (Cross Laminated Timber) soldier panels perpendicular to the tunnels would distribute roof loads evenly across the tunnel footprint. Height constraints, and the depth of glulams required for the desired spans meant that a monopitch design was used, providing natural light and recalling the previous buildings that had occupied the site prior to clearance in the previous century.

Client engagement

The client (Argent) was fully engaged in the setting of targets and vision for the project. The targets were to drive down embodied carbon as low as possible, which drove the selection of consultants and the early design.

WLC reporting summary



Client: Argent

Architect: Bennetts Associates Architects

Structural engineer: Arup

Ecological consultant: RPS

Acoustic engineer: Ion Acoustics

Mechanical electrical public health:
E3 Consulting Engineers

Active play area architect: Carve

Landscape architect:
Townshend Landscape Architects

CDM / health and safety advisor:
David M Eagle

Fire consultant:
Oculus Building Consultancy

Access consultant:
All Clear Designs Limited

BREEAM: SWECO

Carbon profiling:
Sturgis Carbon Profiling llp

Cost consultant: Gardiner & Theobald

Specialist timber subcontractor:
BK Structures

Delivery architect: Stride Treglown