

PLACE LADYWELL

Built in 2014-2016 in London, PLACE Ladywell is owned by Lewisham Council and provides temporary homes to local families in high priority housing need.

The 24 two bedroom apartments and eight retail units were constructed in a factory as 64 fully fitted out units, before being transported by road to site and lifted into place.

Balconies and lift/stair cores were also manufactured and installed on site as separate components.

The units were manufactured from standard timber components using simple technologies and fully fitted out with bathroom, kitchen, flooring and all finishes in the factory. This gave the manufacturer full control over quality, finish and programme, as well as reduced construction time, waste and noise on site.

The planning permission of the site lasts for four years. Once this period is over, the buildings will be deconstructed and reassembled elsewhere in Lewisham to meet further housing needs.



DESIGN FLEXIBILITY

PLACE has a number of design benefits. The units can stack, with the precast concrete cores and modular timber apartments stacked on three or four floors. They are also generous on space, with the space exceeding the current standard requirements by 10%. They are also designed to last for 60 years, with the plan to demount them after use.

CAPITAL COST

The total project, excluding land value, cost £5.4M full development. The off-site elements, 24 x two bed demountable social-housing units and eight commercial units total £4.98M, or £1,200/m².

SPEED AND EFFICIENCY

The scheme delivered a 45% reduction in time on traditional construction. This was achieved by lower on site personnel and construction activities, reducing on site welfare activities and costs, as well as minimising noise and dust to the local environment overall.

From preparatory ground works to practical completion, the construction programme was nine months.

One challenge the project revealed about smart construction is that the speed of utilities needs to be able to meet the changing speeds and efficiency of construction – it took longer than the construction period for the electrics to be connected to the homes.

PRODUCTIVITY

The scheme was very efficient compared to traditional construction methods, with £/man hour productivity of £105 – around four times better than the average of £25.60 per man hour.

As this was a prototype project, productivity will be improved even more for future schemes thanks to the key learnings of this build.

RISK

Risk was minimised with this project thanks to a number of factors. The engagement of a FTSE plc gave confidence to the client that there would be delivery capability, while early engagement between the client and manufacturer meant waste was minimised and the design and development stages were efficient – all vital considering the tight construction programme.

WELLBEING DESIGN

The health and wellbeing of occupants is a fundamental consideration of the development. For example, internal noise was considered with measures such as high specification triple glazing and high levels of sound insulation between dwellings, which exceed acoustic regulations by 60%.

Mechanical Ventilation with Heat Recover was also installed, providing best practice ventilation rates.

The design of the development maximises daylight and sunlight levels within each of the units, allowing good light levels to be achieved when the units are re-configured elsewhere.

Thanks to great local transport links and ease of accessibility, the development can be car free.

External lighting in the development is limited to low energy security lights, which won't cause light pollution.

What's more, the construction process is highly condensed compared to traditional builds, which helps to reduce the impact of noise and air quality on the neighbourhood and local people during the construction stage.

OPERATIONAL AND EMBODIED CARBON REDUCTION

Annual CO₂ emissions for the flat are 11.33 kgCO₂/m² for heating and cooling and 3.7 kgCO₂/m² for regulated electrical usage. Total Annual CO₂ emissions/m² internal floor area is 26.59 kgCO₂/m² for flats.

Vehicle movements and on-site construction activity were reduced by approximately 80%. The onsite workforce was similarly very small with only around 30 people on site.

IN-USE ENERGY PERFORMANCE

The flats have excellent energy efficiency through a fabric-first approach, which does not rely on renewable energy technology or a gas connection. The prefabricated timber elements allow construction to excellent levels of precision and provide a simple, thermally efficient and airtight envelope once constructed.

Annual energy demand for heating and cooling – excluding any contributions from onsite renewables – for the flats are 21.91kWh/m², whilst annual energy demand for regulated electrical usage for flats is 7.14 or 17.37 kWh/m².

SAP calculations show an EPC Rating of B and 12% improvement of block Dwelling Emission Rate over 2013 Building regulations Target Emission Rate are achieved. A code for sustainable homes pre-assessment indicated Level 4 is achievable with a score of 69.6%.

CIRCULAR DESIGN

The land for this project had limited availability of three or four years, therefore it was essential that the units can be easily disassembled while providing attractive, comfortable housing in the meantime.

It was also important to minimise waste – and this method of manufacturing produced 0% waste, considerably more efficient than a traditional build which typically produces 15%.

The design for demounting, moving and reassembling ensures the scheme can be redeployed with minimal associated waste. The only areas of waste are the cladding design to suit the aesthetic of the redeployed location.

AVERAGE/REGULATIONS

Capital cost	£1850/ m ²
Speed	0.17
Productivity	£25.60/ man-hour
PMV	40%
Quality (defects)	99.4%
Health and safety	2.24 injuries per million hours worked
Embodied carbon	875 Kg / m ²
In-use energy	EPC Rating B

PLACE LADYWELL

Capital cost	£1,200/m ²
Speed	N/A
Productivity	£105 / man-hour
PMV	N/A
Quality (defects)	N/A
Health and safety	N/A
Embodied carbon	26.59 kgCO ₂ /m ² *
In-use energy	EPC Rating B

The data is separated in a different table as some of the measures were collected using different methods, therefore not strictly comparable like-for-like.

CONTRIBUTORS



CASE STUDY CONTRIBUTORS

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THE CONSTRUCTION LEADERSHIP COUNCIL

The Construction Leadership Council (CLC) works with industry and government with the objective to identify and deliver actions supporting UK construction in building greater efficiency, skills and growth. It draws together business leaders from across the sector to identify how to promote solutions to meet the ambitious government Construction 2025 targets. This is being delivered via a number of workstreams.

The Construction Leadership Council's Innovation in buildings workstream is embedding innovative construction techniques to improve productivity and capacity in the construction industry, and the quality and whole-life performance of buildings. The work stream is initially focussing on homes, taking action to overcome some of the key barriers to the take up and the commercialisation of Smart Construction; it will expand to all building types later.

To find out more about the Construction Leadership Council, please visit the website: www.constructionleadershipcouncil.co.uk

