

Case Study — Kevin Fenton Mews

25 affordable, low-energy, high-quality new homes in Bromley

Scope of work: Design & Build — Full Turnkey Package (Principal Contractor)

Type of construction: Offsite Volumetric Modern Methods of Construction (MMC)

Location: 1-25 Kevin Fenton Mews, Bromley BR1 5FF

Description: 25 self-contained social-rented homes comprising of 1 & 2-beds apartments using ZED PODS designs and BOPAS accredited build system.

This project is a pioneering, environmental and socially focused development for London Borough of Bromley (LBB), providing 25 homes for vulnerable households who are in temporary accommodation and mostly living outside the borough.

LBB wanted to build super energy-efficient new homes after a gap of several decades. Working with them, our in-house design team created an innovative zero-carbon housing scheme in the airspace above the Burnt Ash Lane car park. It is a 100% affordable residential scheme comprising of two blocks of a total of 10 x 1-bed and 15 x 2-bed flats including wheelchair accessible units, over 80% of existing car parking spaces for the local community. The car park has been also upgraded with additional five CCTVs for the development and two 4.5m pole mounted for the carpark, 15 EV chargers, new 40 cycle storage and new areas of planting.

The steel framed volumetric structure comes with “fabric first” approach combined with on-site renewable energy generation in the form of photovoltaic panels and solar assisted heat pumps to achieve a net zero operational carbon rating in SAP with as build SAP ratings exceeding 100 (A-rating).

Before



After



[Watch Project Video](#)

Clients' Testimonial



“... Planning permission is a welcome step forwards and now we need to work to ensure that this development comes forward as quickly as possible, with the construction process supporting this, as well as helping minimise noise disturbance on site during the shortened construction process. I am pleased that the proposal includes CCTV and a good standard of lighting which will assist in deterring anti-social behaviour which has occurred in this car park in the past. The plan also includes some landscaping in the car park which is rather bare at the moment.”

Councillor Peter Morgan

Executive Councillor for Renewal Recreation and Housing



“We were pleased to approve this application unanimously. It complies with the required planning policies, including affordable housing, and helps meet the need for more homes.”

Alexa Michael

Chair of Bromley Council Development Control Committee



ZED PODS specialise in bringing forward development on constrained sites that are tricky to build. Our innovative off-site volumetric construction makes these kinds of sites including Burnt Ash Lane in Bromley are viable. Carparks are often vital community services and need to be kept in operation. Traditional build methods would not work on this scheme.

Few measurable outcomes:

- Exceed all planning standards
- Zero wastage in manufacturing process and reduced waste during on-site construction process
- Increased the quality of the internal environmental performance & and created zero operational carbon homes
- Installation of 50 modules on raised platform within a fortnight to reduce disruption to local community
- Super-insulated, airtightness construction with less than 1.3 air changes per hour @ 50 PA
- Low energy ASHP with high performance minimum COP of 3 (According EN14511 is calculated for the heat pump and counter flow heat exchanger combined, for more detail see Nilan Compact S data sheet Version 3.00)
- Solar PV panels with 2.6 kW's per apartment were factory fitted and generate more energy than is consumed annually.

Innovative off-site MMC

Use of clever design and lean off-site manufacturing process has helped to achieve the above and reduce construction waste, increase precision, improve quality and reduce carbon footprint.



Above: The steel podium platform be installed in days than months



Above: Off-site Production — up to 90% of the building work is completed in the UK based factory so once the groundworks are completed, the units were delivered to site and installed in matter of weeks.

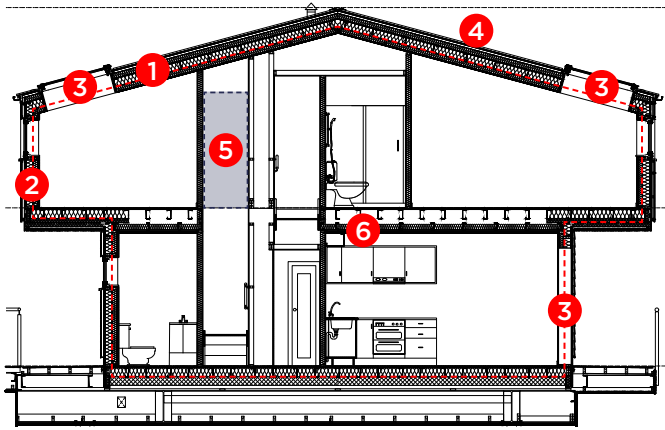


Above: On-site Construction — minimising on-site works reduce the amount of noise pollution generated by machinery for cutting, drilling; fitting out the modules off-site means that for less materials and components are stored on site helping to keep the area clean and tidy; Off-site material cutting and processes reduce amount of airborne dust created during works, improving air quality.



Zero Carbon Strategy

A combined strategy of enhancing building fabric, maximising the number of energy efficiency measures, and applying low carbon and renewable technologies.



1

U-Values
 Wall: 0.15 W/m².K
 Roof: 0.12 W/m².K
 Floor: 0.11 W/m².K

External Construction
 Super-insulated & Air-tight External
 Wall Build-up with Earthwool Insulation

2

Permeability
 2.0 m²/m²/hr

Air-tightness Membrane

3

U-Values
 Opening:
 0.82 W/m².K

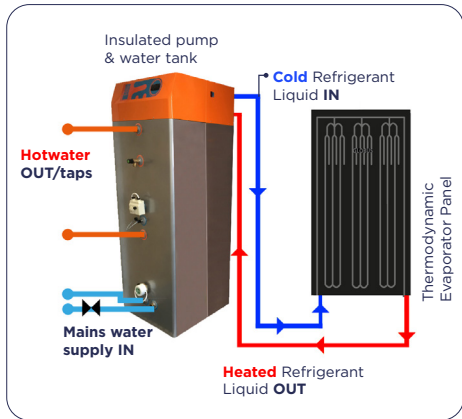
Triple-glazed low-E
 windows & doors

4

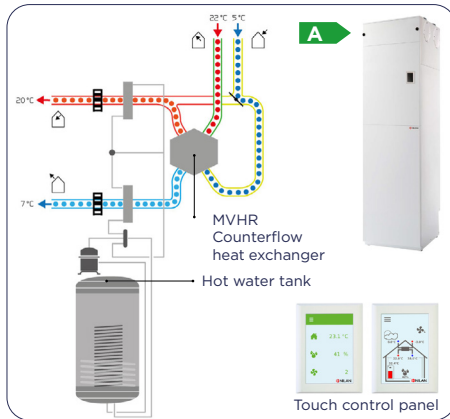
PV Production
 59,725 kWh/Yr

Roof-mounted Solar
 Photovoltaic

Above: Long Section — ZED PODS modular construction adopts a fabric first approach to increase energy efficiency and mechanical ventilation to recycle waste heat in the air. The remaining space heating, hot water and electricity demands are met with on-site renewable energy systems.



6 One-Bed Apartments
 Solar Assisted Heat Pump



6 Two-Bed Apartments
 Combined MVHR & Heat Pump



5 Mechanical Ventilation
 The heat stored in the exhaust air is drawn out and used to heat the outside air flowing into the property



- Est saving **40.4** tonnes/CO₂/year of operational carbon at a rate of **25.15** kg/m²/year (over a Part-L compliant new build) i.e **2,020** tonnes over 50 years.
- Est Saving **537,502** Litre water per year over Baseline*
*Baseline water consumption based on England Compliance of 125L/person/day from Building Regulations Part-G 2010 with 2016 amendments)

Energy Performance Certificate

12 Kevin Fenton Mews
BROMLEY
BR1 5FF

Energy rating
A

Valid until **29 September 2032** Certificate number **9232-9131-4200-0280-0276**

| Score | Energy rating | Current | Potential |
|-------|---------------|---------|-----------|
| 92+ | A | 103 IA | 103 IA |
| 81-91 | B | | |
| 69-80 | C | | |
| 55-68 | D | | |
| 39-54 | E | | |
| 21-38 | F | | |
| 1-20 | G | | |

Anticipated Carbon Emissions

| Part L Compliance | | Standard New Build | | Kevin Fenton Mews | |
|---|-------------------------------|---|-------------------------------|---|-------------------------------|
| CO ₂ (kg/m ² /yr) | Total CO ₂ (kg/Yr) | CO ₂ (kg/m ² /yr) | Total CO ₂ (kg/Yr) | CO ₂ (kg/m ² /yr) | Total CO ₂ (kg/Yr) |
| TER | | UK Average DER | | Anticipated DER | |
| 25.48 | 41,162 | 15.82 | 25,434 | 0.61 | -4,730 |

* New build data taken from ONS housing efficiency and median property sizes

Carbon Savings (Tonnes CO₂eq)

| | CO ₂ Emissions (tonne/yr) | Over 10 Yrs | Over 30 Yrs | Over 100 Yrs |
|-----------------------|--------------------------------------|---------------|----------------|----------------|
| Project Impact | -4.73 | -47.30 | -141.90 | -473.00 |
| Over Part L | 46 | 458.92 | 1376.76 | 4589.22 |
| Over Typical Build | 30 | 301.64 | 904.91 | 3016.38 |

Water Savings (Litre)

| Number of Occupants | Water Consumption (Average L/Person/Day) | Water Consumption (L Per Year) | Savings over baseline (L Per Year) |
|---------------------|--|--------------------------------|------------------------------------|
| 65 | 102.36 | 2,430,154.35 | 537,501.90 |

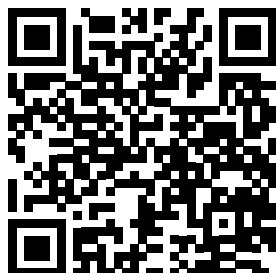
*Not including sprinkler demands or external usage



Interiors — 3D Virtual Tour



[1 Bed 2 Storey](#)



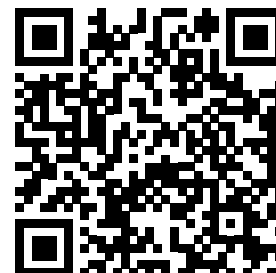
Maisonette
GIFA: 58.3 sqm

[2 Bed 2 Storey](#)



GIFA: 72.7 sqm

[2 Bed 1 Storey](#)



Part M4(3) Compliant
— Wheelchair user dwellings
GIFA: 61.6 sqm