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PANATTONI PARK

AVONMOUTH

CASE STUDY: NET ZERO CARBON



 // panattoni.co.uk/avonmouth

Project outline

Panattoni Park Avonmouth is a two-warehouse logistics and distribution development totalling 1.3 million sq ft. The units were developed on a brownfield site within an existing industrial estate. Each building includes ancillary offices, extensive service yards, car parks and a gatehouse.

Both buildings are designed and constructed to BREEAM 'Excellent' standard, are EPC 'A' rated and have achieved a 20% reduction in CO2e during the construction phase from their baseline carbon model. Like all Panattoni buildings now, they were constructed within the Target Net Zero programme.

Target Net Zero programme

Target Net Zero is the framework Panattoni is adopting to achieve its aspiration of ensuring all new buildings are net zero embodied carbon in construction by 2025. It also requires us to optimise operational carbon reduction, not just through specifications like resource metering and twin-therm cladding, but through measures like roof loading that can support 100% PV coverage, should an occupier want to install it in future.

The programme covers all Panattoni buildings and is proving so successful we may beat our 2025 target.

A 0-25

EPC
RATING OF
'A'

BREEAM[®]

BREEAM
RATING OF
'Excellent'



NET ZERO
CARBON IN
CONSTRUCTION



Location

Panattoni Park Avonmouth, Avonmouth, Bristol.

Status

Practical Completion September 2023.

Partners

Principle Contractor: **ISG**
Architect: **AJA Architects**
Environmental consultants: **Circular Ecology**





Building sizes

Unit 1

- GIFA of 37,718m²
- Warehouse internal floor slab = 36,361m²
- Office space = 1,300m²
- External service yard slab = 9,831 m²

Unit 2

- GIFA of 84,727m²
- Warehouse internal floor slab = 78,687m²
- Office space = 3532m²
- External service yard slab = 41,800 m²

Scope and Objectives

- Panattoni Park Avonmouth Unit 1 / 2 is Net Zero Carbon – Construction in line with the UKGBC Framework
- The scheme's NZC status is third-party verified by Circular Ecology
- RICS life cycle stages A1-A5 have been included in the assessment, inclusive of construction impacts and waste management
- A carbon reduction from the baseline was targeted with a limit of 650kgCO₂e/m²



Implementation

Low carbon / sustainable initiatives implemented at Panattoni Park Avonmouth:

Embodied Carbon Reduction Measures

- 20%-55% Ground Granulated Blast Furnace Slag (GGBS) cement replacement concrete
- 90% recycled content Electric Arc Furnace Reinforcement steel for concrete slabs
- Twin Therm Low Carbon Cladding (Environmental product declarations (EPD) third-party verified)
- Recycled aggregate
- Internal slab thickness reduction
- Focusing on EPDs when selecting materials including steel, insulation, and cladding



Construction Activity Carbon Reduction Measures

- Using a smart monitoring system, ISG were able to optimise the efficiency of the welfare cabins significantly to reduce the energy demand and fuel required
- Requested subcontractors use HVO if possible, a lower carbon fuel than typical diesel
- Effective waste management and segregation onsite to reduce trips required for waste disposal and volume of material sent to landfill
- All timber used to deliver steel to site was returned and reused again, reducing waste
- All timber procured for the build was responsibly sourced
- Local procurement of key materials where possible to reduce material mileage
- Toolbox talks and awareness onsite regarding energy consumption and effective waste management

Carbon Model

The model was finalised at RIBA Stage 6 as the project reached practical completion using information from the following sources:

- As-built elevations and site plans
- As-built foundation and floor slab drawings
- As-built bill of quantities
- Concrete design mixes
- Environmental Product Declarations (EPD)
- Primary construction impact information: fuel invoices, water meter readings, waste reports and material breakdown

Materials with Environmental Product Declarations (EPDs) were prioritised. When not available, the closest local match was selected on OneClick LCA based on material specifications.

Once complete, the model was supplied to Circular Ecology for verification.

The remainder of the embodied carbon was offset by purchasing carbon credits from Gold Standard, including reforestation and projects with wider social and economic benefits such as waste management and water quality.

Unit 1 = 14,841 tCo2e (393 kgCo2e/m²) exc. sequestration, saving 3,706 tCo2e from baseline

Unit 2 = 36,139 tCo2e (426 kgCo2e/m²) exc. sequestration, saving 2,918 tCo2e from baseline

Report Output

Unit 1

- Final Model = 14,841 tCo2e exc. sequestration
- Saving of 3,706 tCo2e (20% reduction) from the baseline of 18,564 tCo2e
- 15,842 carbon offset credits purchased from Gold Standard – offsetting 1,001 tCo2e more than the residual carbon produced

3,706 **20%**

tCO2e SAVED
compared to baseline

CO2e REDUCTION
during construction

Unit 2

- Final Model = 36,139 tCo2e exc. sequestration
- Saving of 2,918 tCo2e (7% reduction) from the baseline of 39,057 tCo2e
- 37,419 carbon offset credits purchased from Gold Standard – offsetting 1,280 tCo2e more than the residual carbon produced

2,918 **7%**

tCO2e SAVED
compared to baseline

CO2e REDUCTION
during construction





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