

The New Brentford Hospital

IPSUM
ASSOCIATES

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DESIGN DRIVERS

- Health and Wellbeing**
 - High Quality of Care
 - Therapeutic Environment
 - Indoor and Outdoor Comfort
 - Community Integration
- Sustainability**
 - NHS Carbon Targets
 - Durability
 - Nature Integration and Sponge City
 - Energy Neutral
 - Water Efficiency
- Constructability**
 - Flexibility
 - Prefabrication
 - Efficiency of Delivery
 - Adaptive Reuse
 - Whole Life Cycle and Circular Economy

KEY THEMES

- Design and Engineering
- Transport and Mobility
- Sustainability
- Health and Wellbeing

SITE CONSTRAINTS

- Existing infrastructures on site
- Railway lines surrounding the site
- Limited vehicle access
- Noise pollution

1 Net Zero Energy

100% renewable energy supply; facilitating zero carbon energy carbon

Renewable Energy Grid 15%, Solar Panels 17%, Ground Source Heat Pump 68%

On Site Off Site

100% 85% 21% 10% 0%

100% Renewable Energy Grid

2 Layout Design

3 Foundation Design

Side elevation of Single Pile

Plan view of Foundation

Side elevation of Pile Cap

Loading Capacity of up to 9860 kN

4 Flexibility Design

Main Building

Car Park

Expansion Provisions

Design Solution

- Long Term Hospital Expansion: Up to 300 Patient Beds, Additional Facilities, Build Time Up to 3 Months
- Short Term Nightingale Hospital: Up to 1500 Patients Beds, Build Time 2 Weeks, Utilities Can Be Repurposed

Services: Oxygen pipes, Casting Holding Down, Electrical Junction Box, Water and Drainage Pipes

5 Rainwater Harvesting

Maximum potential of rainwater harvesting utilised to reduce water demand and improve durability

DEMAND VS SUPPLY

Accumulative Initiatives

14 Central Atrium

Provide a sense of arrival to patients and staff

A biomorphic gridshell structure to bring light, ventilation and peace in the space

6 Adaptive Reuse

Existing concrete structure is retained

New timber extension block added

13 Site Set up

Storage Areas

Delivery Routes

Temporary sites

7 Community Engagement

Design: Web Site, Newsletters, Workshops

Construction: Job Opportunities, Construction Windows, School Site Visits, Meetings

Occupancy: Green Pathway, Open Fair, Public Transport Access, Co-ordinated Treatment

De-Construction: Repurposing the Space, Reuse of Materials, Improved Accessibility

Community engagement throughout the design and construction process to integrate the hospital into the local area and design it, prioritising its users.

12 Passive Design Strategies

Natural lighting solution with solar gain controls and insulation

Hybrid, natural and mechanical ventilation solution

Chimney natural ventilation to direct pollutants away from main building

11 Transport Solutions

NEW bus stop on site

NEW Multistorey Car Park

NEW Lionel Road South Train station

Surface Level Car Park

10 Structural Frame

Structural calculations determined that **5275 UC 305x305x283 columns** and **5275 356x171x67 beams** would be sufficient with the column arrangement proposed.

Total Factored load on critical column - **8960 kN**.

Column arrangement of the NBH which dictates the structural frame and foundations

9 Pedestrian Access Strategy

440 NEW Cycle Parking Spots on site

NEW Pedestrian Route around site

NEW Cycle Lanes & Cycle Route around site

8 Green Landscaping

Green landscaping solution incorporating noise pollution mitigation and sustainable urban drainage enhancing the ecology and wellbeing of the patients.

LIFE CYCLE CARBON

Accumulative Carbon Reduction (%)

- 83%

Carbon Reduction Initiatives

- Total
- Renewable Energy
- Passive Design Strategies
- Public Transport Initiatives
- Beamline Size Reduction
- Timber Construction
- Vegetable Segmentation
- Design for Deconstruction
- Deconstructing Existing Structures
- Rehabilitating TBRC

SUSTAINABLE TARGET ACHIEVEMENTS

- Health and Wellbeing**: 2% daylight factor over 80% of the area, 95% of the floor area in 95% of spaces provides an adequate view out
- Energy**: Net Zero Carbon Energy, 30% reduction in electricity consumption
- Transport**: 60% of users travelling to the hospital with low carbon transport modes, 440 bicycle storage spaces provided
- Water**: 65% reduction from baseline of total water consumption
- Material**: 40% of the materials are recycled and/or reused, Net Zero Carbon Enabled
- Waste**: Amount of non-hazardous waste generated per 100sqm < 1.9 tonnes, 90-95% of waste diverted from landfill
- Ecology**: Maintain 100% of existing ecology, Ecologically enhance 45% of the total site area
- Pollution**: NO2 < 15ug/m3 annual emissions average, PM10 < 10ug/m3 annual emissions average

CONSTRUCTION PROGRAMME - SCOPE OF WORKS

1. Project management	2. Pre-construction	3. Construction	4. Post-construction
Design & planning	Site investigations	Site setup	Sorting of waste
Final Design	Material procurement	Stockpile for reuse	Temporary Roads
	Deliveries & Storage	Structural Frame	BREEM Certification
		Slabs and walls	Handover
		MEP	Building management
		Finishing	
		External work & Landscaping	

0 yrs. Up to 5 yrs.

Construction programme for Ipsum Associates proposal, demonstrating a maximum of 5 years required for completion but with strategies such as the Laing O'Rourke 70 60 30 method incorporated to potentially reduce construction times by up to 1.5 years.

CERTIFICATIONS

INTERNATIONAL WELL PLATINUM

BREEM OUTSTANDING*

BRE GLOBAL

*Projected certification