

THE NEW BRENTFORD HOSPITAL Integrated Design



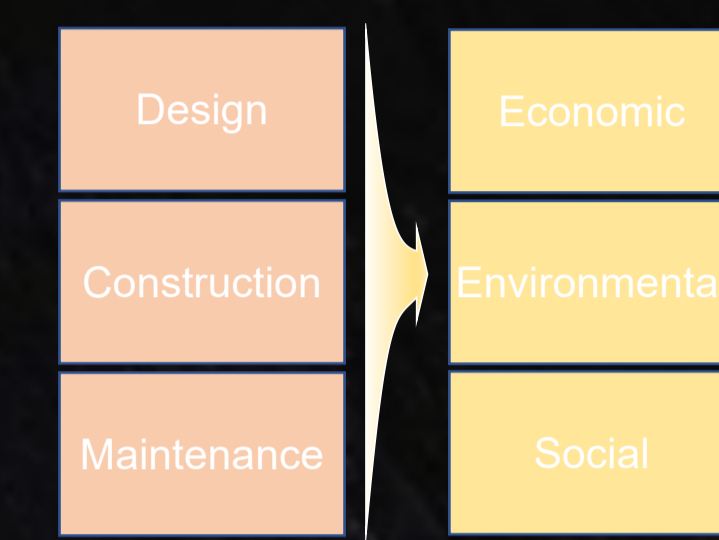
CEGE0048: Integrated Design (20/21)

01 Delivering a Sustainable Hospital

Key Building Design Features

- CLT (Cross-laminated timber) integration on interior for inpatient wards and outpatient suites
- Interior facades will be open towards central green space
- Structure orientation will look to achieve a glazing ratio of 40-50% in order to balance need for artificial lighting and heat gains
- Addition of biophilic design features – green spaces, green roofs and wood/plant exposure on the interior of structure

Problems



Vision

- Sustainability
- Community
- Wellbeing
- Accessibility

Goals

- Treatment of disease
- Promotion of health
- Prevention of disease
- Hub for biomedical research
- Help patients recover their wellbeing
- Have a positive effect on staff performance and retention
- Improve efficiency of operational relationships

Delivery

By classify each stakeholders identified, we recognize a list of important stakeholders need to engage consistently with different methods.

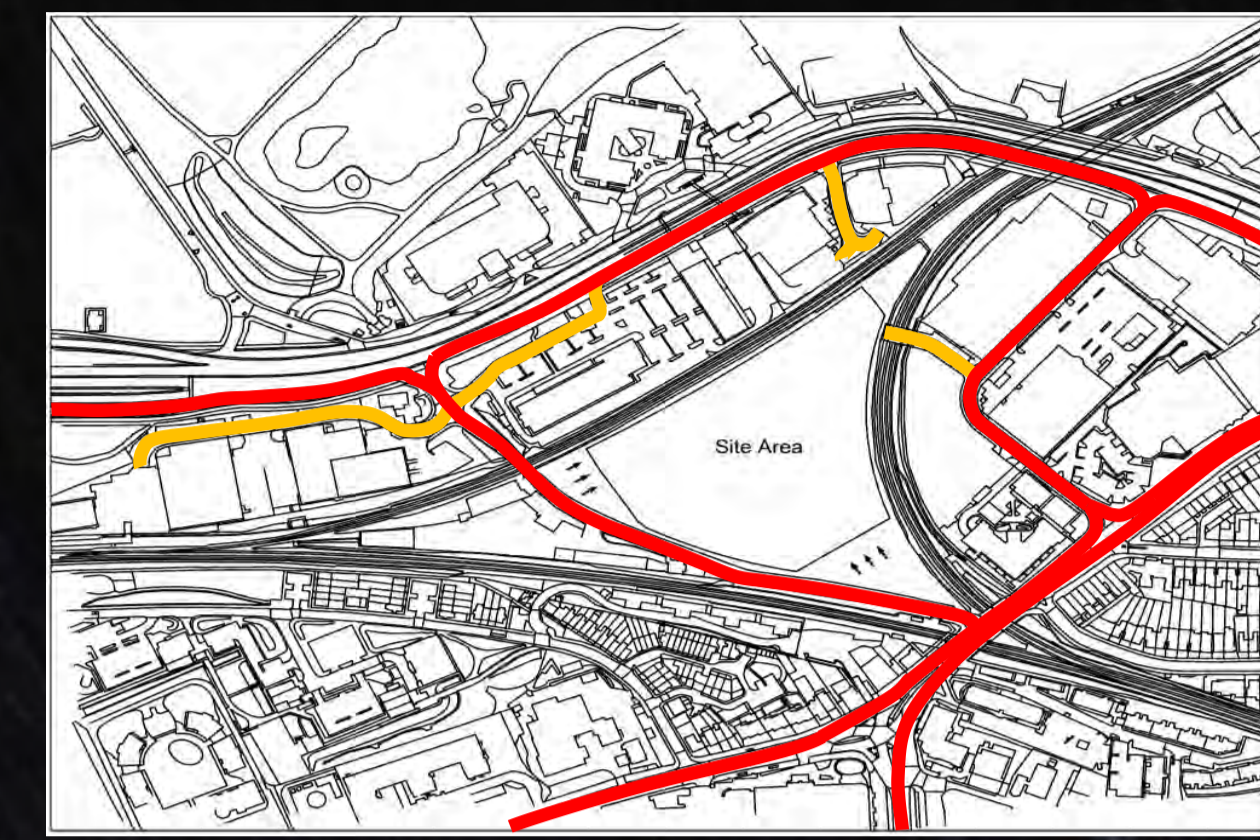
Prompt communication and assurance on progression and planning	
Local HOSC	MEPS Richmond & Hounslow Council NHS England CQC CCG HSE
Regular communication and engage continuously	
Media	NBH and Wider NHS Staff Governors
Prompt communication under requirement	
Suppliers	Local Schools Businesses
Focused report and engage on specific issues	
Voluntary Organizations	Patients Contracted Staff Healthwatch Trade Union

Method of Communication

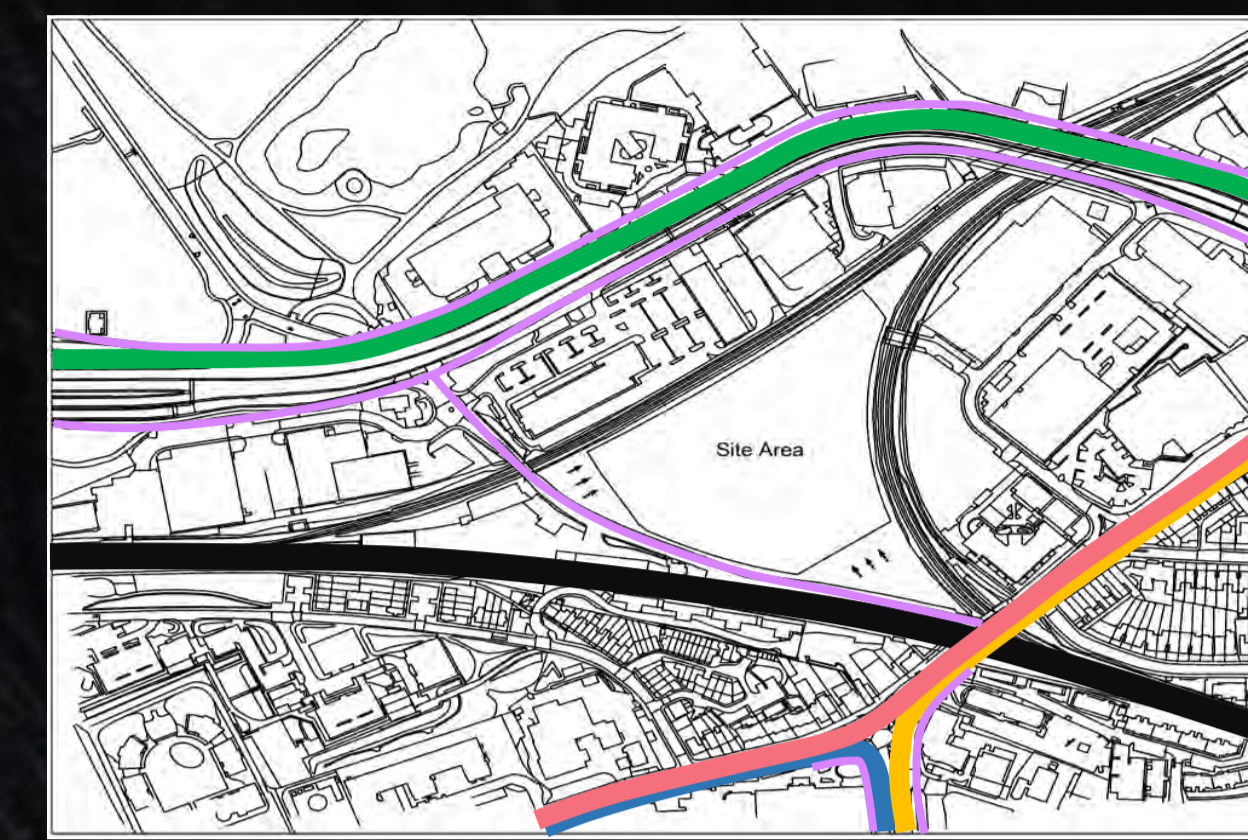


02 Site Condition

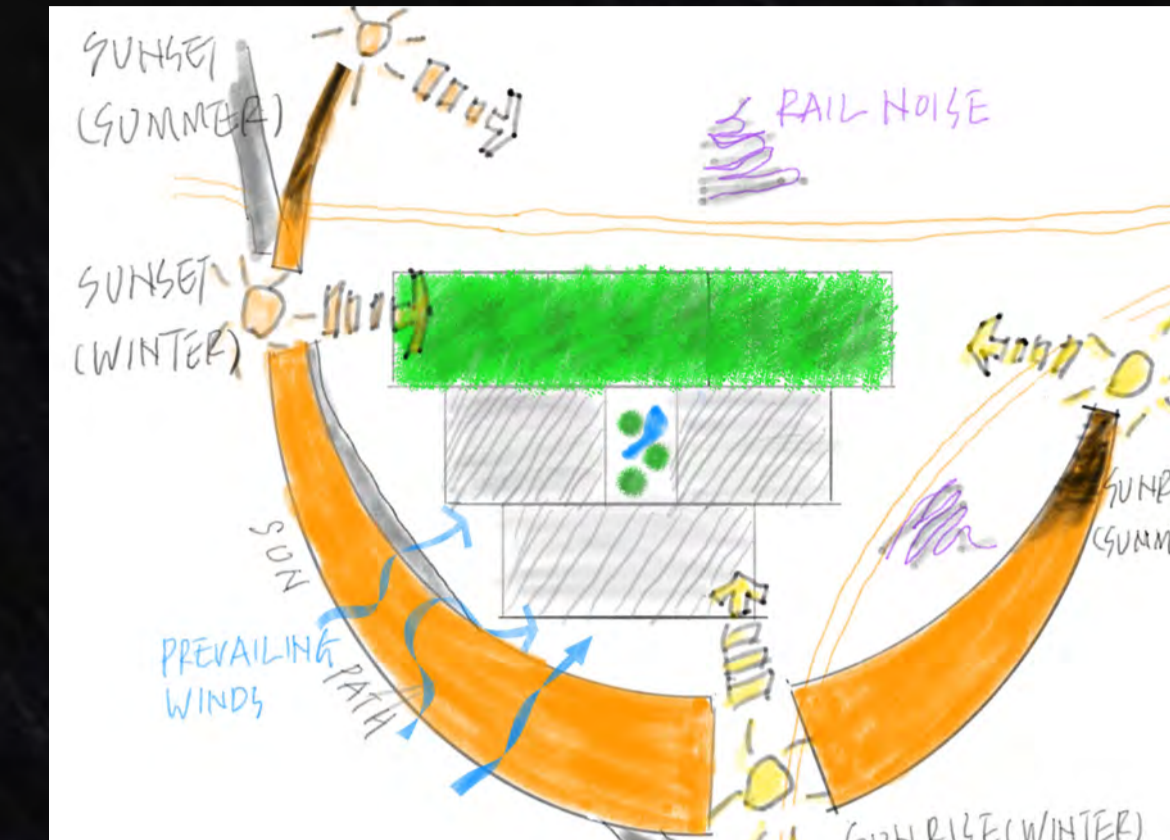
Transportation



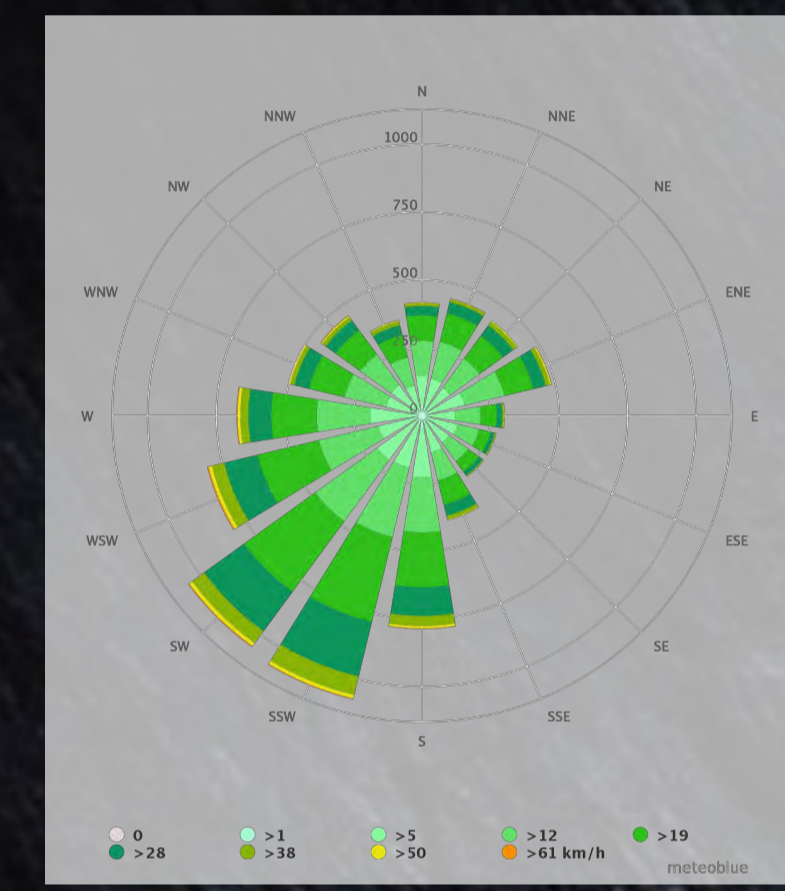
- Main Roads
- Minor Roads



- Bus Route 110
- Bus Route 237, 267, N9
- Bus Route 65, N65
- South Western Railway
- Cycle Route

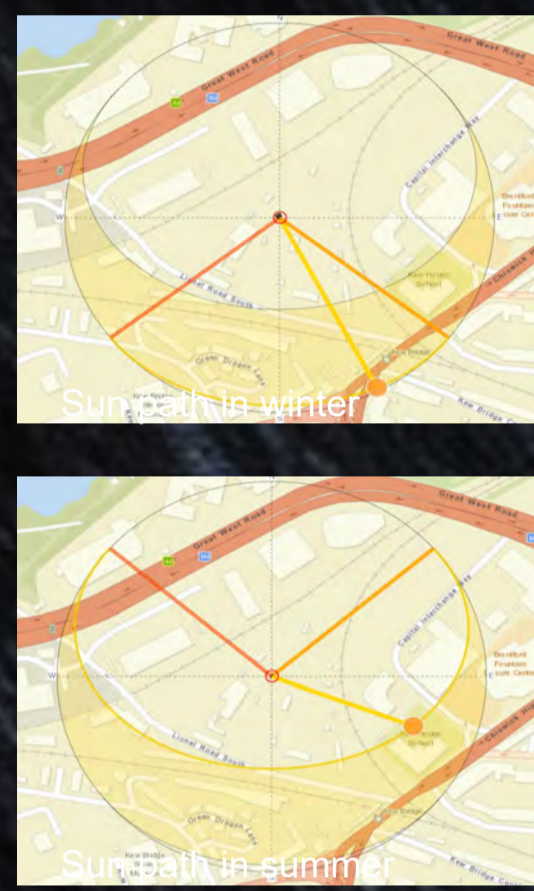


Wind Rose



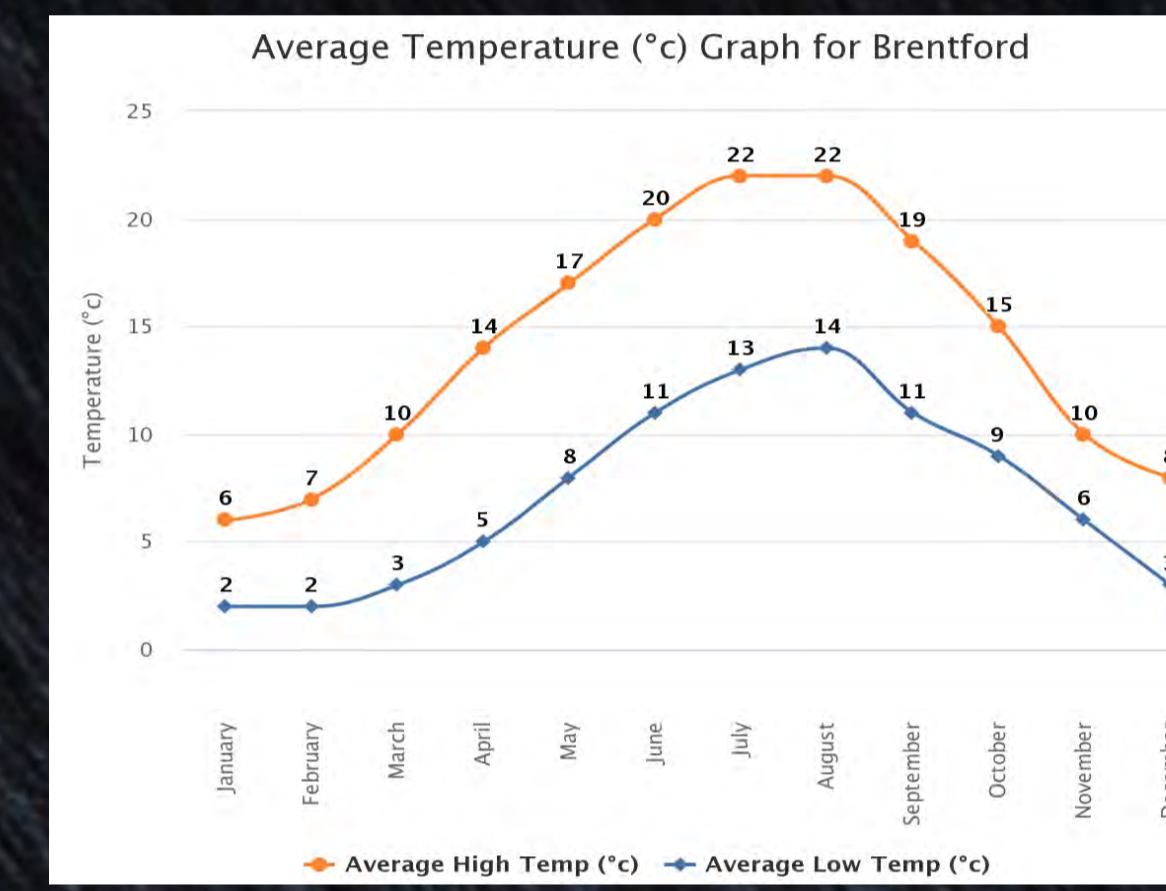
The prevailing wind in Brentford is coming from the South West and the South South West. Almost 60% of wind in 19 to 28 mph.

Sun path



Daylight duration: Approximately 8 hours in winter and 16 hours in summer.

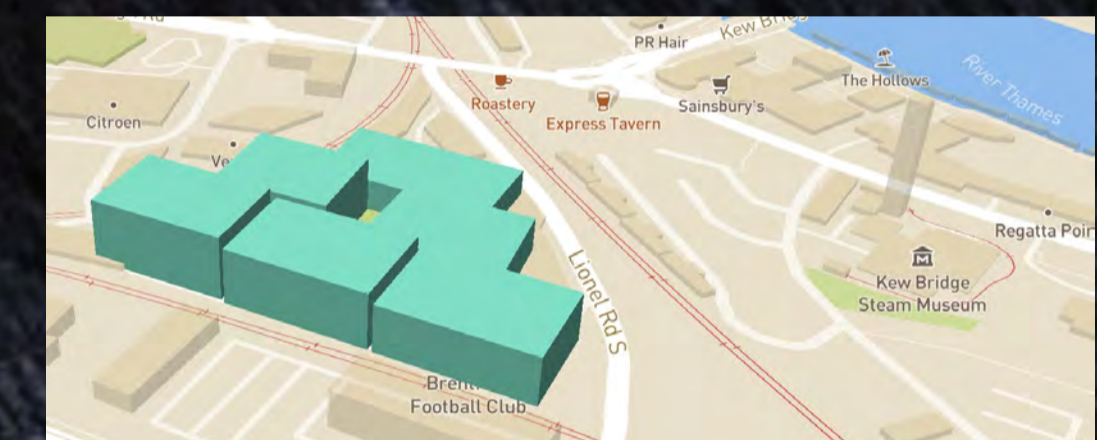
Temperature



- The highest average temperature throughout the year is 22 °C
- The lowest average temperature throughout the year is 2 °C

Building Orientation

- #### Impact on Patient Experience
- More favorable patient outcomes
 - Improved patient recovery and wellness
 - Shorter post-operative hospital stays
- #### Impact on Building Performance
- Maximizes passive ventilation features
 - Less reliance on artificial lighting
 - Reduces energy usage, cost and operational carbon emissions



Key Results

117,500 m²/1050 m²
Internal Area/Green Space
407/814 (Emergency) Wards
714 Parking spaces

03 Pandemic Response Measure

Quarantine Hospital Modular Design



In order to deal with the outbreak of epidemics such as COVID-19, the modular design of quarantine hospitals will be used as a method to solve the problem of serious shortage of hospital beds. Container modules are easy to install and transport, and the materials are easy to produce and obtain.

04 Design Process & Innovative Implementations

Biophilic Design



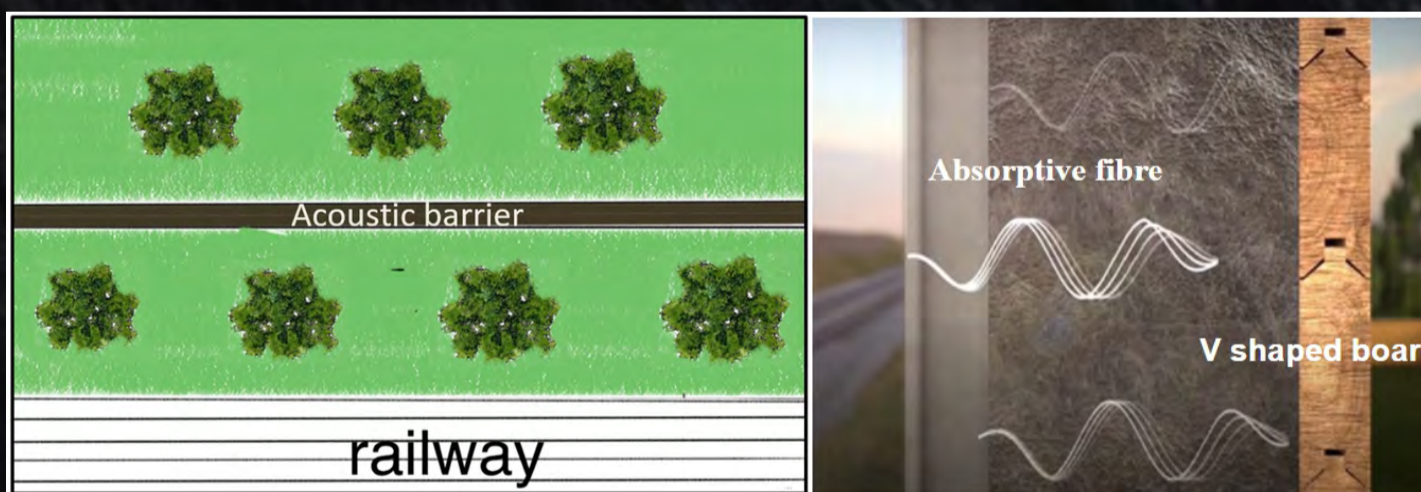
- #### Impact on Building Performance
- Green roofs will act as an insulator and absorber for stormwater
 - Offer unique nature integration
 - Reduce excessive noise
 - Improve air quality
 - Zero cost on water consumption
- #### Impact on Patient Experience
- Postoperative patient stays are shortened
 - Reduce stress and relieve pain
 - Improved hospital staff performance and retention
 - Increased socialization among patients and staff

CLT Integration



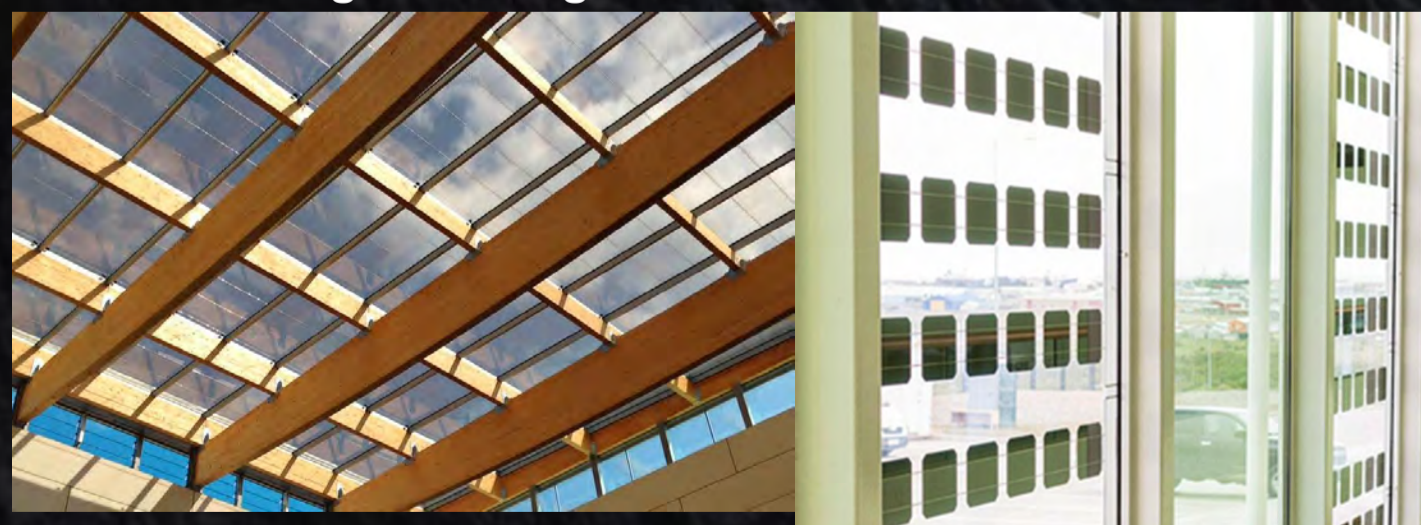
- #### Impact on Building Performance
- Reduces foundation depth
 - Utilizes an efficient and clean construction method
 - Reduces embodied carbon emissions
 - Attractive appearance
- #### Impact on Patient Experience
- Shorter post-operative hospital stays
 - Increased feelings of relaxation
 - Less stress and increased wellbeing

Acoustic barrier design

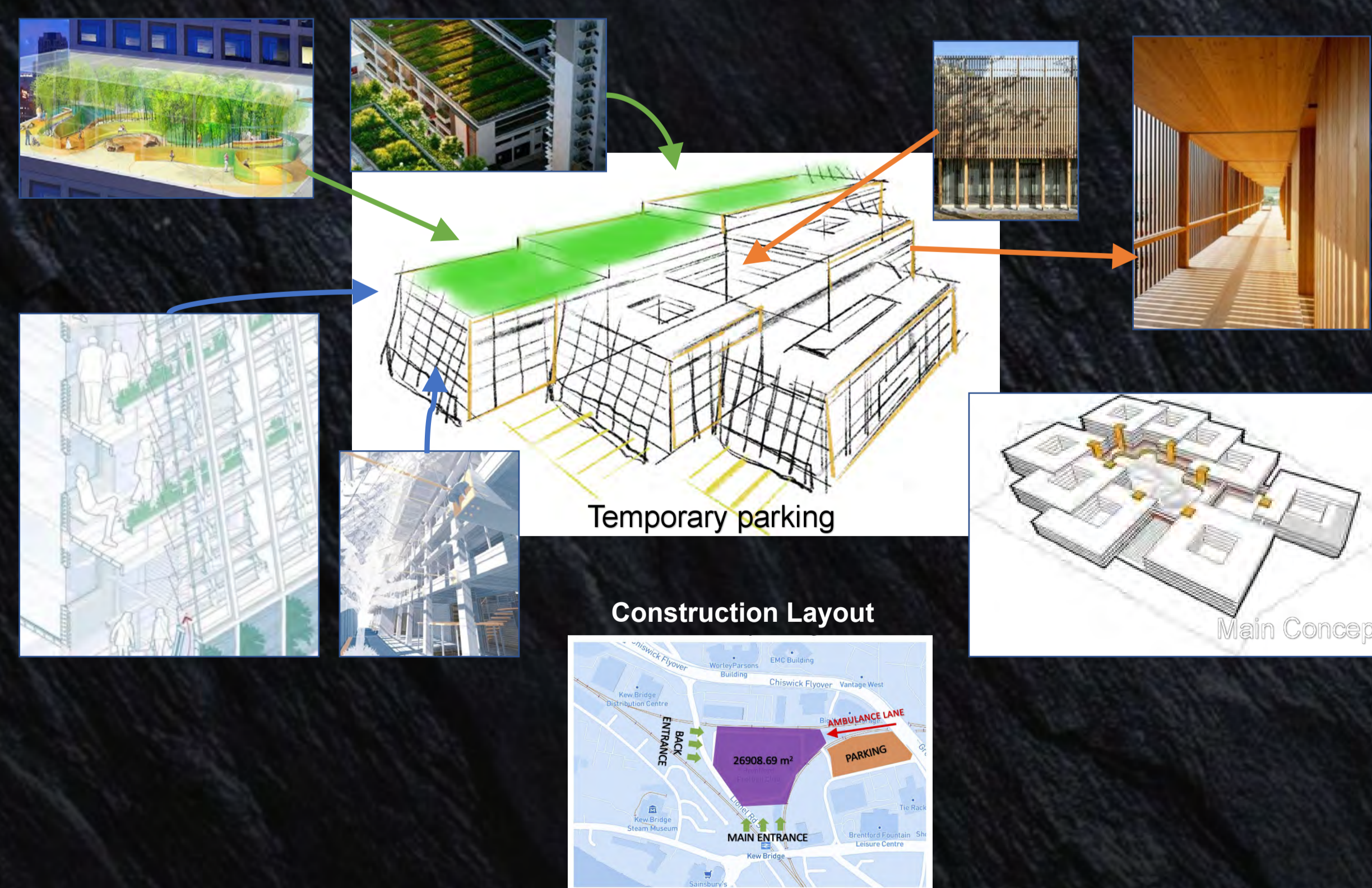


Absorptive acoustic barrier can be used as a solution to reduce the noise transmission in the hospital, especially the noise generated by the railway and road.

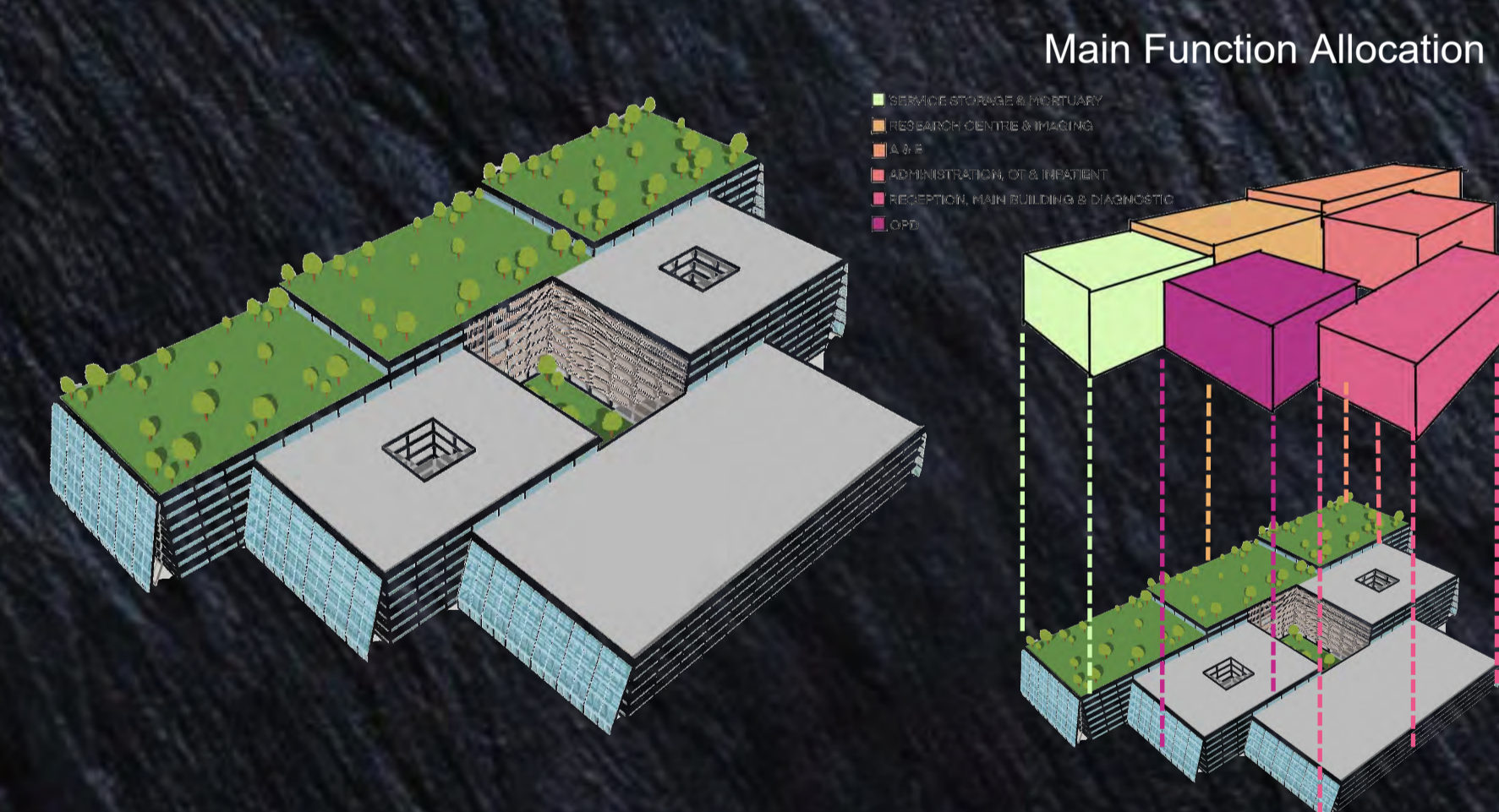
Photovoltaic glass design



Photovoltaic glass can be used as skylights and curtain wall in hospital design to capture sunlight and convert it into electricity. It can improve the energy efficiency of buildings, reduce operating costs and reduce carbon emissions, and has the same thermal and sound insulation impacts as traditional architectural glass.



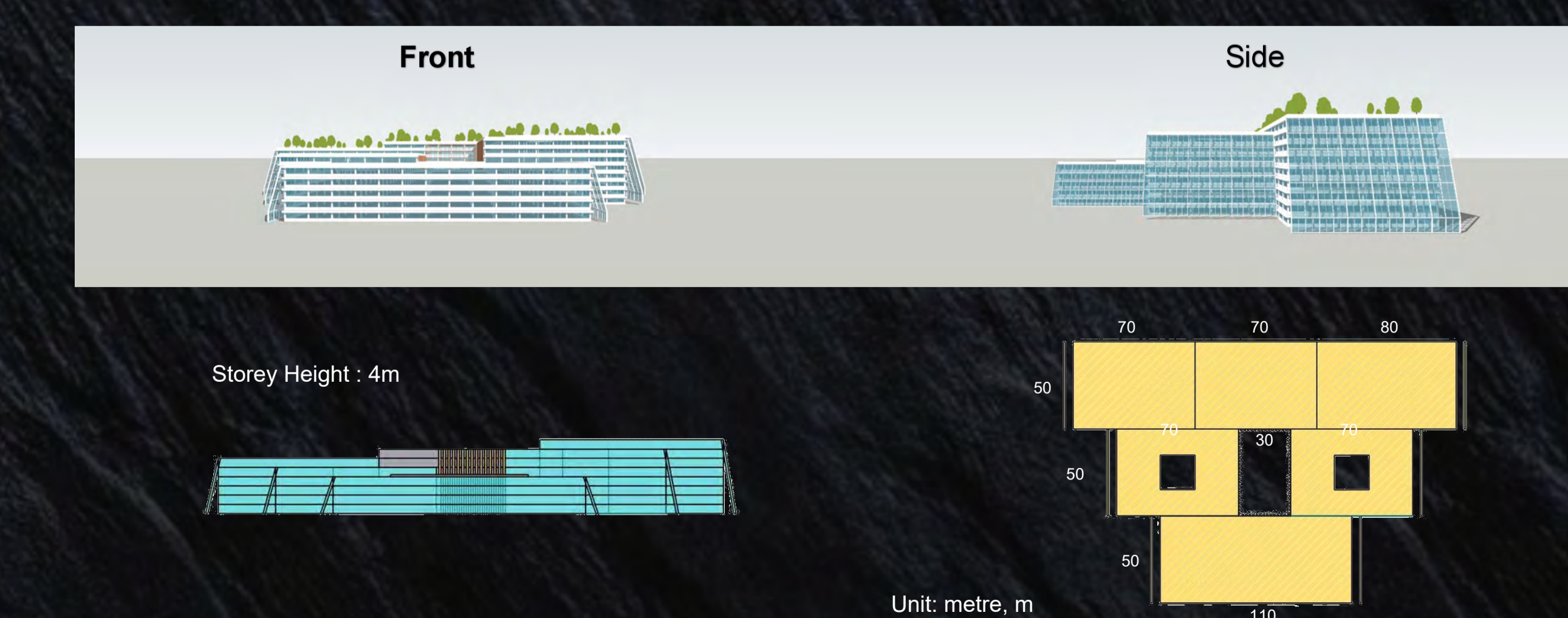
05 Conceptual Design



Main Function Allocation

Perspective Views

06 Orthographic Views



07 Interior Design



08 Construction Schedule

According to the hospital construction plan announced by the NHS in 2021, many new hospitals will be delivered between 2025 and 2030. Therefore, it is planned to accelerate the construction of New Brentford Hospital and complete it around 2027. The approximate schedule chart is shown in the figure.

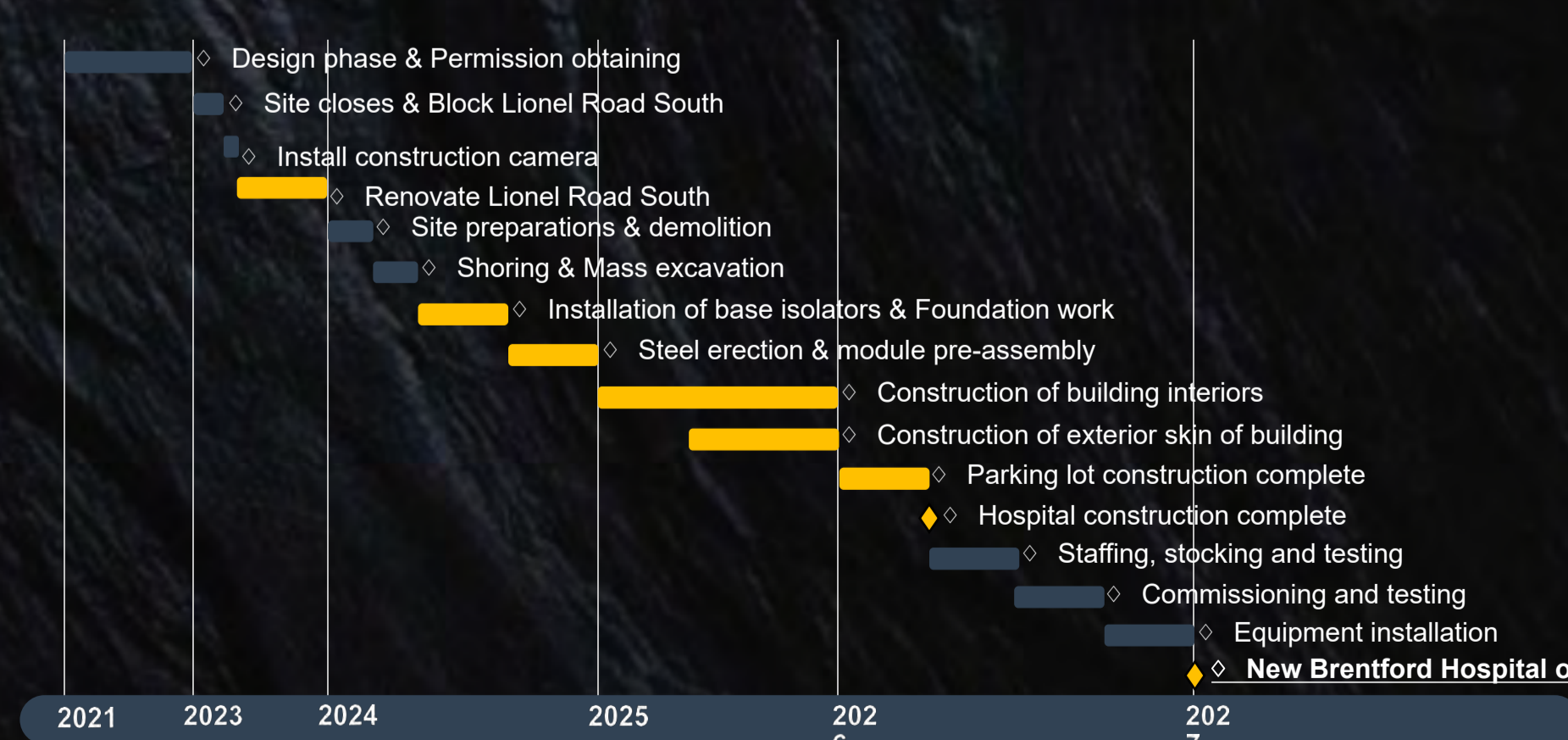


Figure 13 Approximate construction process timetable