

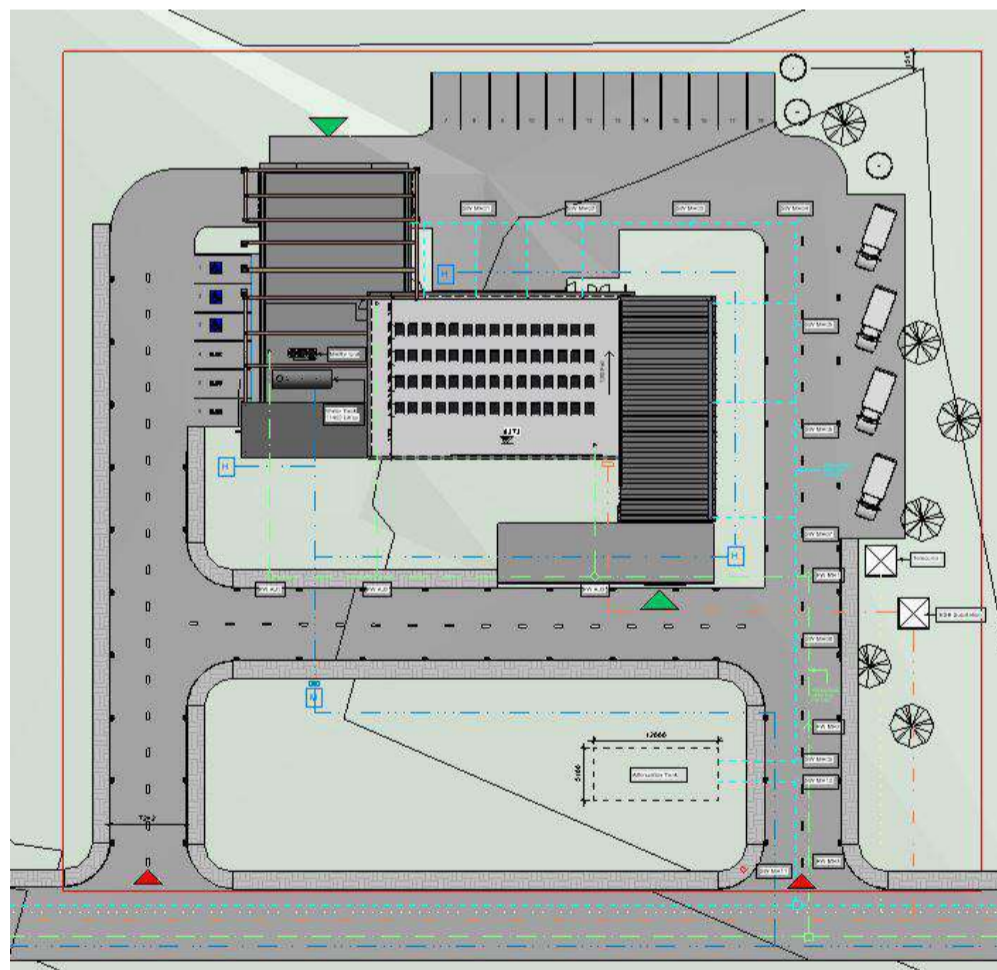


Context

The Dundrum Healthcare Centre's metamorphosis from a conventional mental institute signifies a profound evolution in mental health services. The transition reflects Dundrum's commitment to reimagining care, moving away from institutional models to embrace patient-centric, community-integrated approaches. This shift is not only physical but also symbolic of a more compassionate era in mental health treatment. The historical significance lies in Dundrum's dedication to transforming mental health care, aligning with contemporary principles of inclusivity and patient focus. Unlike traditional mental institutes, the center's design is community-centric, fostering support and belonging through open spaces and patient-friendly architecture. Equipped with advanced technologies, it modernizes mental health care, ensuring accessibility and adherence to evolving healthcare standards. The redevelopment signifies a departure from dehumanizing aspects associated with mental institutes, focusing on destigmatization and creating an inclusive and compassionate environment. Aligned with Dundrum's broader vision, the Healthcare Centre exemplifies repurposing historical structures for contemporary needs while preserving the community's essence. In conclusion, this transformation narrates a tale of progress, compassion, and resilience in mental health care.



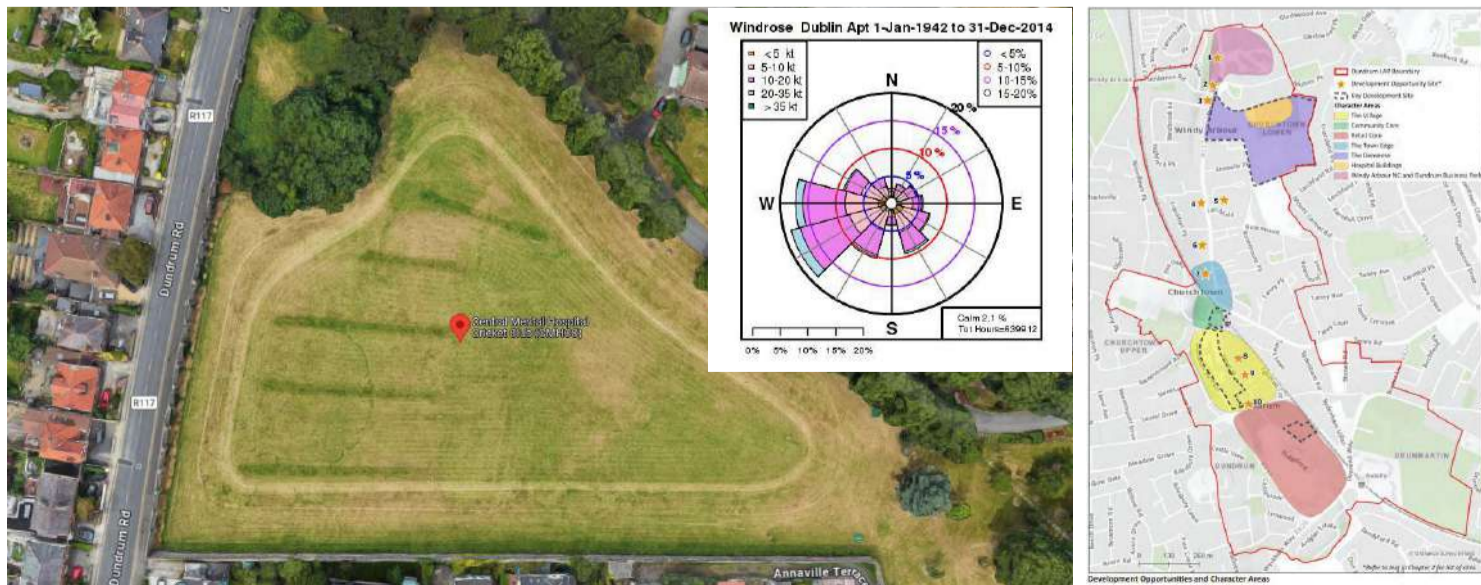
Dundrum Healthcare Centre Site Plan Layout



Storm Water:

1. Bauder XF301 Green Roof used on Healthcare Centre
2. Rainwater from all of the following building will be harvested using Rainwater Harvesting Tanks for re-use as grey water for flushing toilets and urinals. Any excess water will be used to water the allotments and kitchen garden.
3. Rainwater Harvesting tank must be in accordance with BS55-2009
4. Water must be collected from 50% of the flat roof area
5. Tanks must have a 1500L minimum capacity per pedestal
6. Gutter must be watertight, pipes should also be firmly supported without restricting thermal movement
7. Stormwater discharge will be attenuated via a hydrobrake manhole. The combined volume of the attenuation tank for all the buildings should be suitable sized (see notes on Attenuation Tank) for the 1 in 40 year storm
8. Stormwater discharge must incorporate method of slowing the discharge of storm water
9. Swales are used on free green areas with minimum width of 2m
10. Silt Control - Silt traps to be incorporated into all gullies and manholes around the site
11. Attenuation Tanks (see notes on Attenuation Tank) to be lined with Geotextile membrane
12. All Surface Finishes to be permeable (see notes on Road and Paving Construction)
13. Paving discharge to be discharged into landscaped areas
14. Drainage of car parks to be connected to a class 1 by pass petrol separator/petrol interceptor to ensure no oils or petrol pollute the Local Authority Systems

Foul Water:
Low water demand appliances and sanitary fittings will be adapted throughout in conjunction with dual flush w/c's aerated taps etc

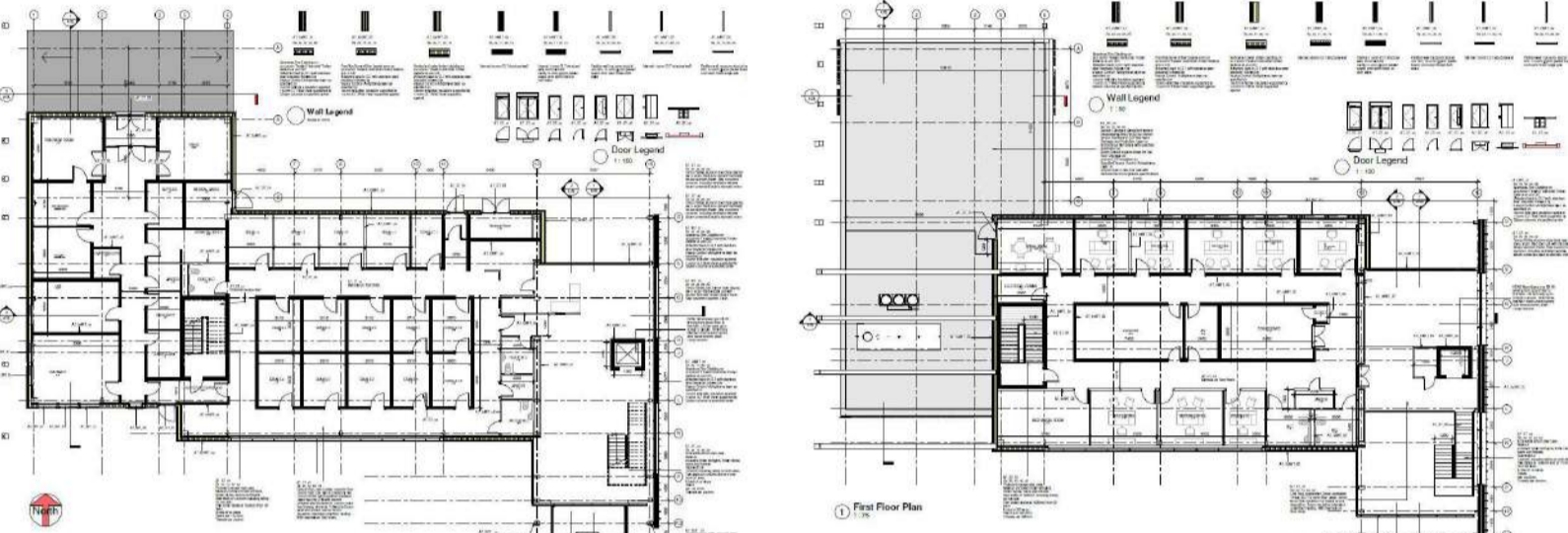


Section 2.3.2 of the 'Dundrum Local Area Plan 2023' discusses the 'Former Central Mental Health Hospital Lands'. Surrounding the empty plot of land dedicated to the new healthcare centre, is the demesne, consisting of the open space character lands forming the majority of the site, together with the perimeter wall, gate lodge, walled garden, former agricultural buildings and other modern structures and landscape features within the grounds.



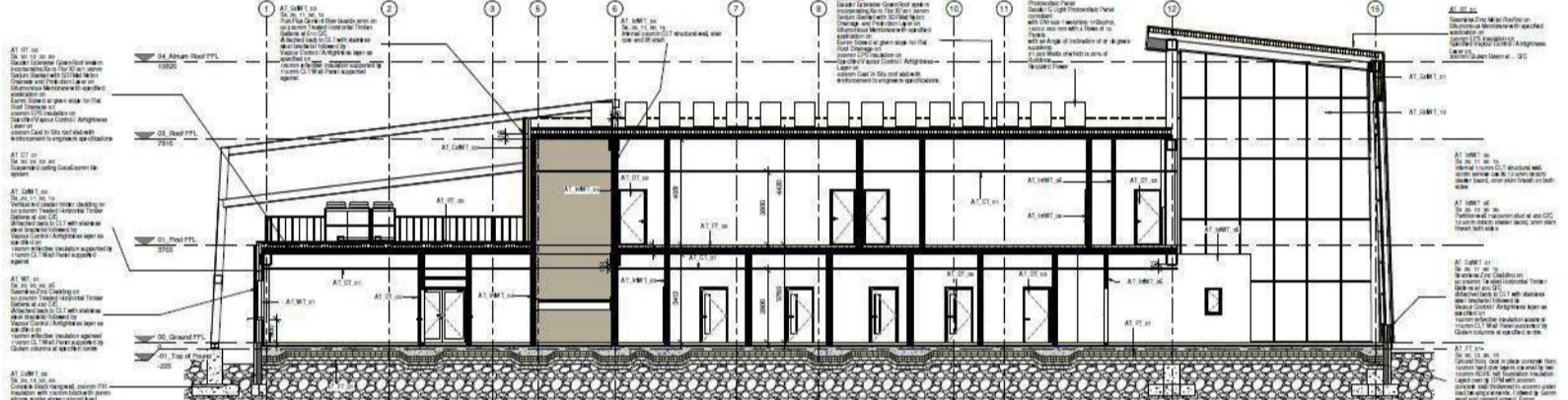
South Elevation

North Elevation

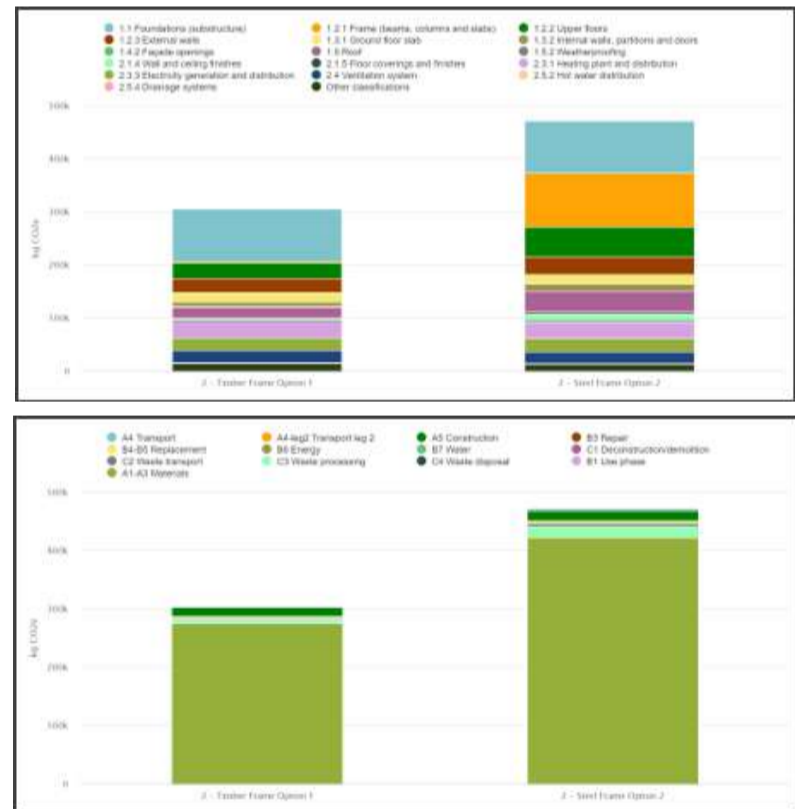


Ground Floor Plan

First Floor Plan



Building Section



OneClick LCA Report

To evaluate the buildings carbon emission contribution, an 'Life Cycle Analysis' was conducted on the hospital. By calculating the buildings overall footprints with considerations including glazing, roof types, etc. a report can be created to measure the hospital's life cycle. For the report, I used 'Timber Frame' as the baseline and 'Steel Frame' as the scenario to compare against, as steel frame would be the next most common solution for this type of construction. A variety of insights can be found in this report. It is clear from the graph comparing both scenarios' life cycle stages, that stages A1-A3 (Materials) dominate the building's total kg CO2e. However, the Steel Frame contributes to this 59% more than the Timber Frame. This can be seen in Figure (represented by the forest green section).

When looking at the bar graph comparing the building's individual elements, additional observations can be made. If we look at all the elements with a relative ratio to each other, they are equal with an exception made to one element: 'Frame (beams, columns, slabs)'. When using Timber Frame, the report produces that it only contributes 2696.29kg CO2e, in drastic contrast to Steel Frame which presents 102105.89kg CO2e. Considering the software material database needs to take into consideration the processes in constructing engineered timber products, this observation will very much remain the same. This can be seen in Figure (represented by the orange section)

Materials Environmental Impact

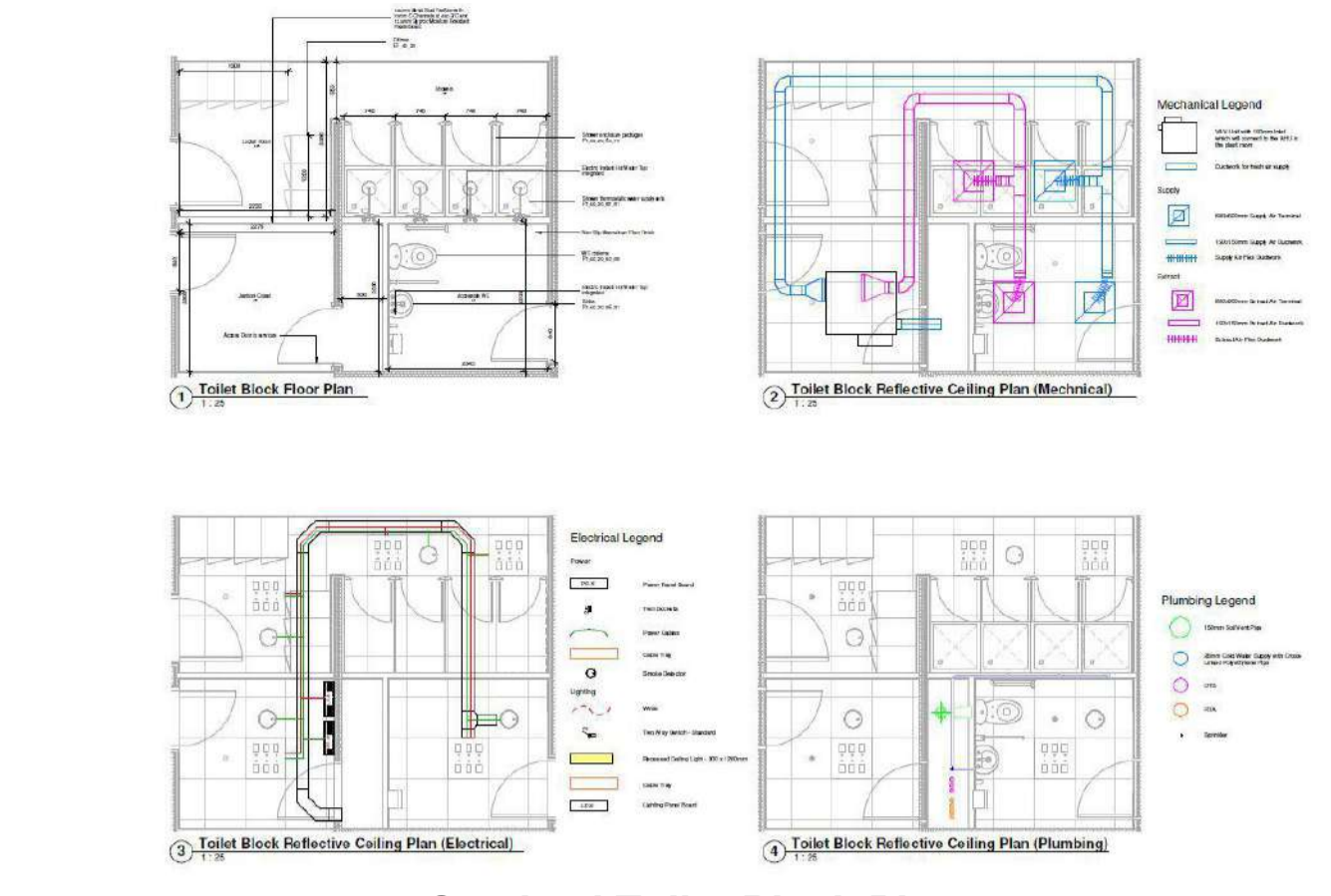
The choice of materials for constructing the Dundrum Healthcare Centre, including Cross-Laminated Timber (CLT) for wall and roof panels, Glulam columns in the atrium, and Woodfibre board insulation, plays a significant role in minimizing the environmental impact of the building.

Cross-Laminated Timber (CLT) for Wall and Roof Panels:
Environmental Benefits: Renewable Resource: CLT is made from sustainably harvested wood, which is a renewable resource. This choice contributes to reducing the demand for non-renewable materials.
Carbon Sequestration: Wood acts as a carbon sink, sequestering carbon dioxide from the atmosphere. Using CLT in construction helps store carbon rather than emitting it, promoting carbon neutrality or even negativity.
Energy Efficiency: Thermal Performance: CLT panels offer excellent thermal insulation, reducing the need for additional energy consumption for heating or cooling. This can result in energy savings during the operational phase.
Construction Efficiency: Prefabrication: CLT panels are often prefabricated, reducing on-site construction time and minimizing disruption to the surrounding environment.

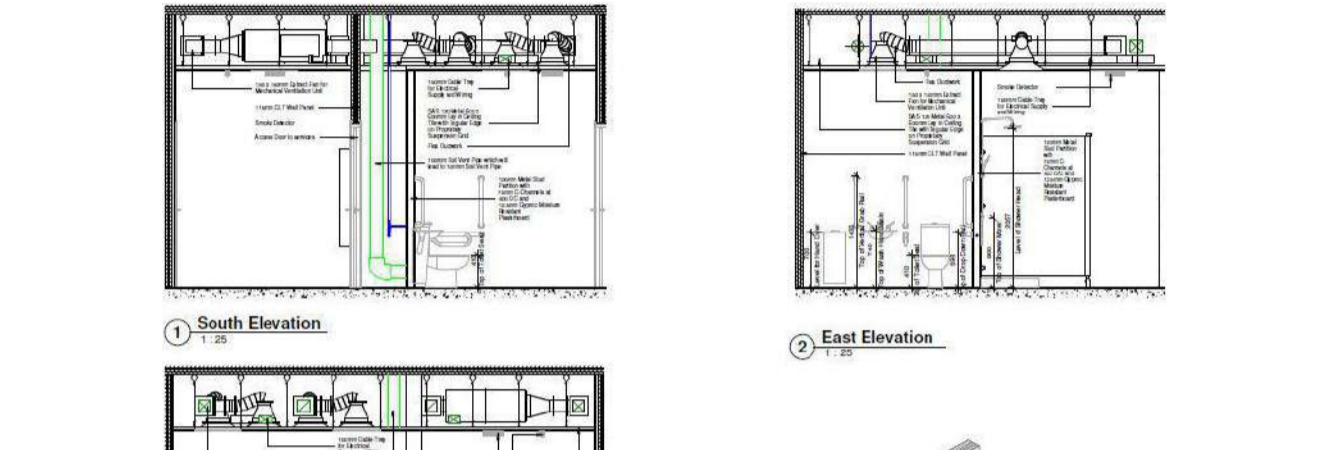
Glulam Columns in the Atrium:
Aesthetic and Functional Benefits: Aesthetic Appeal: Glulam columns provide a warm and natural aesthetic, contributing to a healing and welcoming environment in the healthcare center.
Structural Integrity: Glulam offers high strength and durability, ensuring the structural integrity of the atrium while minimizing the need for excessive materials.

Environmental Considerations: Renewable Material: Like CLT, Glulam is made from renewable wood resources, reducing the reliance on non-renewable materials.
Low Embodied Energy: The production of glulam typically requires less energy, compared to traditional steel or concrete columns, contributing to lower overall embodied energy in the building.

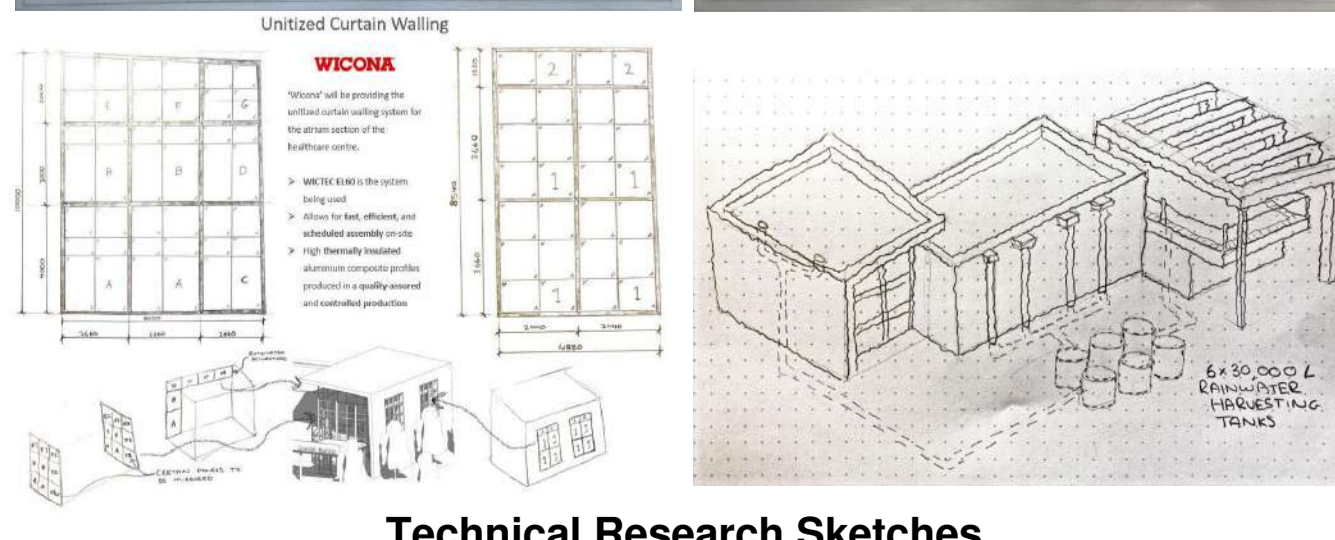
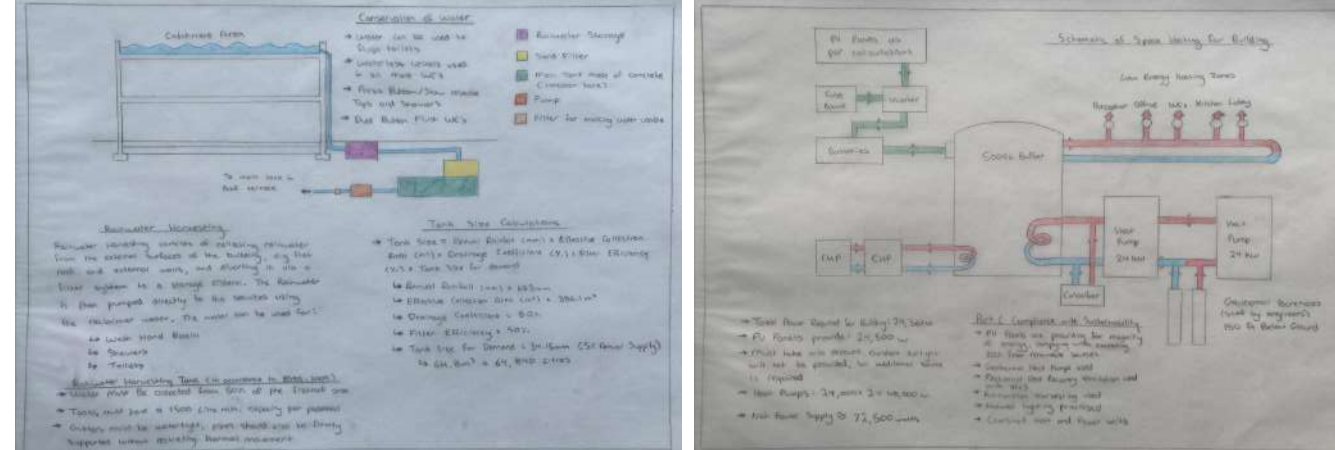
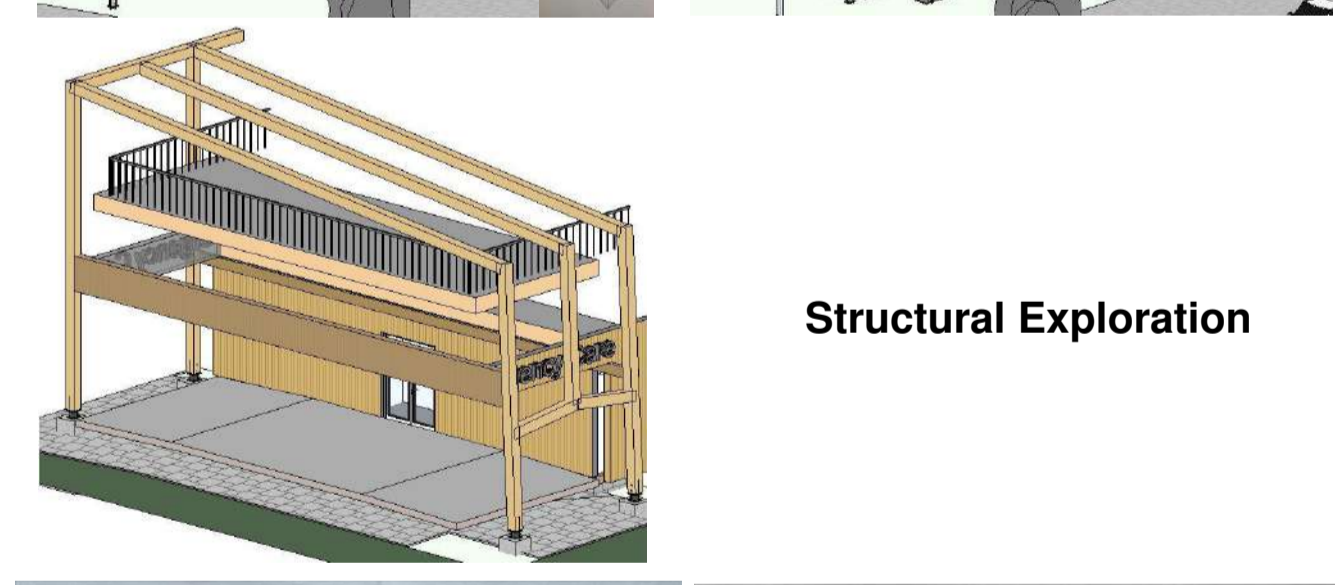
Woodfibre Board Insulation:
Thermal Performance: Effective Insulation: Woodfibre board insulation provides effective thermal insulation, contributing to energy efficiency in both heating and cooling systems.
Sustainable Sourcing: Renewable Material: Woodfibre insulation is derived from wood, a renewable resource. Using such materials supports sustainable forestry practices.
Health Considerations: Indoor Air Quality: Wood-based insulation materials generally contribute to better indoor air quality compared to some synthetic alternatives, positively impacting the healthcare environment.



Serviced Toilet Block Plans



Serviced Toilet Block Elevations



Technical Research Sketches

Technical Details 1:10

Cantilever Junction Detail
Cantilever Upstand Detail
Roof with Hidden Gutter Detail
Green Roof to Parapet Detail
Wall to Ground Floor Detail
Window Head Detail
Window Sill Detail
Roof Detail
Green Roof to Parapet Detail
Intermediate Floor to Column Transfer Detail