

FRIARS POINT

MIXED USE SCHEME OF APARTMENTS & WORK UNITS

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RAIN WATER HARVESTING

The site exhibits very little top soil, therefore rainwater harvesting has been included in the design of the building. Water will be stored in plants and the substrate on the roof which will reduce the peak load of drainage and reduce the risk of flooding. The stored water will reduce expenses along with providing water for non drinking activities such as water for washing machines, toilets, cladding maintenance etc.

THERMAL ENERGY STORAGE

High levels of solar gain can be stored within the concrete flooring to help regulate internal temperatures. Heat will be absorbed by the concrete as temperatures rise and will subsequently release it as they fall. The thermal mass in concrete floors and stairs will slow thermal inertia to buffer both daily and seasonal changes in thermal conditions.

POWER PRODUCTION A

Standing Seam Roof - Kalzip's AluPlusSolar system. This glass free photovoltaic (PV) system comprises flexible PV laminate (PVL) adhered to the surface of the Kalzip profiled standing seam roof. This roofing construction enables seamless and discrete integration of PV. The seamless integration was more suitable for the maritime environment. Framework for glass modules was avoided as they would be susceptible to high speed winds having being places at the highest point of the building.

POWER PRODUCTION B

Additional on site power needs are met by photovoltaic integrated curtain walling, which is stored via batteries in the plant room. Any surplus electricity is fed back into the grid.



RAFT FOUNDATION

After identifying the site features bedrock and soils of a low bearing capacity, a raft foundation was chosen to be best suited to support the development. Excavation for foundations would be a lengthy and costly process. A raft foundation would allow the weight of the building to be distributed over the entire area, and not to individual foundations. This reduces the stress on the soil and will support the building evenly.

BUILDING ENVELOPE

High levels of insulation, air tightness and waterproofing allow for a passive house construction. The rainscreen systems enable air to constantly circulate throughout the facade, forcing any moisture that penetrates the joints of the cladding panels out before it reaches the building structure. This system was chosen as it will naturally reduce the lifetime maintenance costs of the design. The cladding itself is also easy to maintain, which will allow for removal of individual panels to allow for easy repairs.

The brief is based on the development of a prominent site at Barry Island, South Wales for a mixed-use scheme of apartments and work units. It required the design of a 6 storey mixed-use building; incorporating workshops at ground floor, offices on first floor, with the second to sixth floor accommodating a mixture of one and two bedroom apartments.

The key requirements of the brief included taking maximum advantage of the site along with the integration of the building with the landscape. Additional requirements included taking full advantage of the potential views, to demonstrate best practice in sustainable and ecological design, and for the design to include elements of technical innovation.

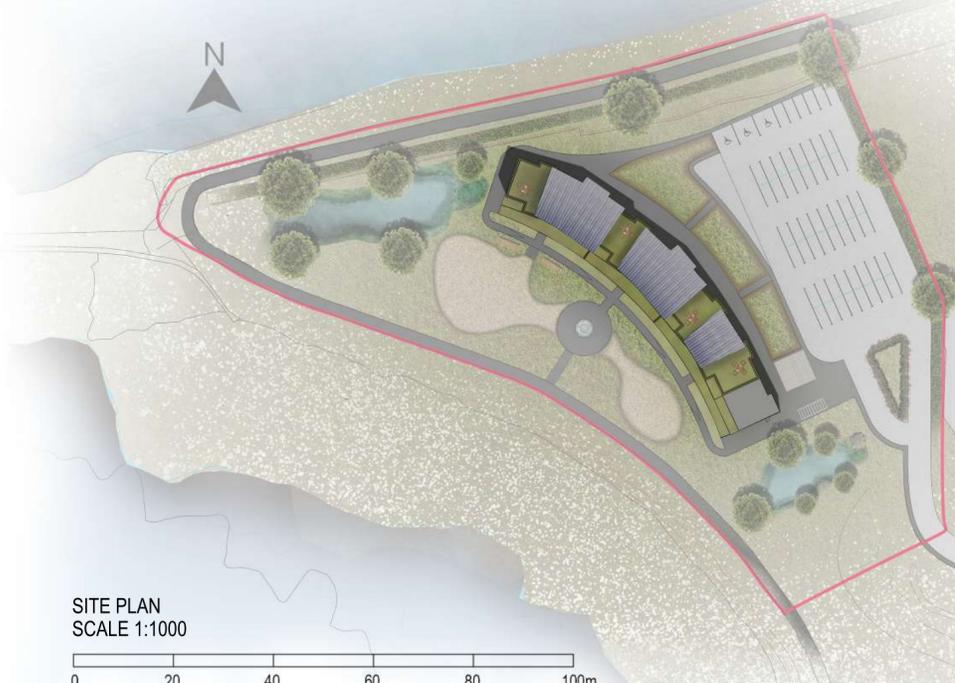
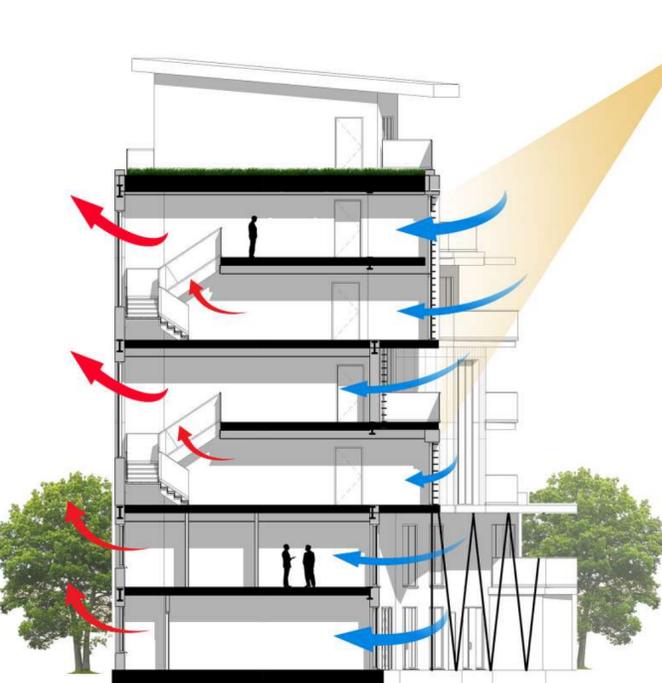
The topography of the site varies from 5-15 meters above sea level. There are no flat areas on the site and it is surrounded by a coastal path. It features 360° of unspoilt views, which are of the surrounding harborside and across the Bristol channel.

The building has been designed to address the brief, to minimize the environmental impact of the development, whilst enhancing the local environment for wildlife and residents. As the site features bedrock and very little topsoil, the building has been stepped and positioned in harmony with the site's topography. Its position allows for high levels of solar gain along with panoramic coastal views. Due to very little topsoil, green roofs, landscaping and retentions ponds have been used to improve on-site drainage and promote plant growth.

VENTILATION STRATEGY

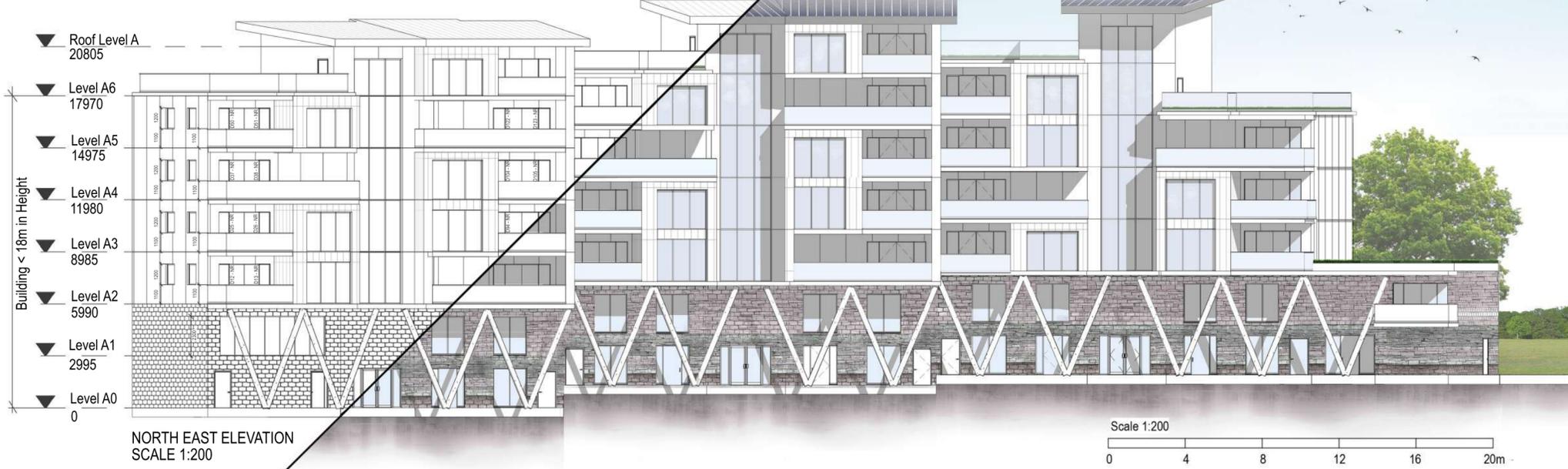
The development has been designed to be naturally ventilated. All Spaces are designed for cross ventilation or dual aspect ventilation. The building has been positioned perpendicular to prevailing winds to provide a clean flow of air to the building while displacing warming air in the given structure. The narrow design of the building including a high standard of airtightness in the envelope will allow for a successful passage of air.

Sunshade and trees mitigate the sun throughout the year. Louvers controlled by the Building Management System will help control sunlight and internal temperatures to prevent overheating.



SITE PLAN
SCALE 1:1000

0 20 40 60 80 100m



- ▼ Roof Level A 20805
- ▼ Level A6 17970
- ▼ Level A5 14975
- ▼ Level A4 11980
- ▼ Level A3 8985
- ▼ Level A2 5990
- ▼ Level A1 2995
- ▼ Level A0 0

NORTH EAST ELEVATION
SCALE 1:200

Scale 1:200

0 4 8 12 16 20m

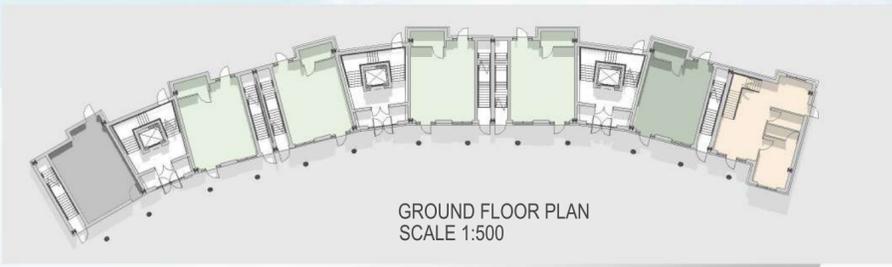
FRIARS POINT

MIXED USE SCHEME OF APARTMENTS & WORK UNITS

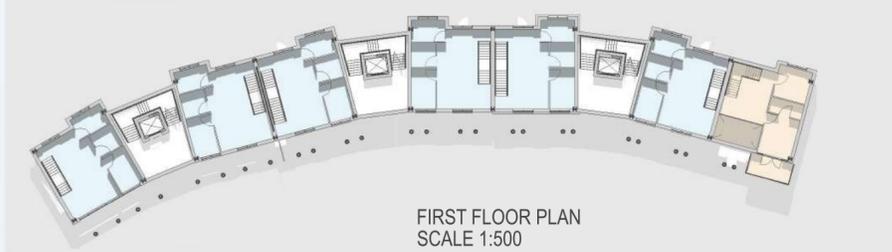
Room Legend

- SHOP/GALLERY
- STUDIO/WORKSHOP
- OFFICE SPACE
- ONE BEDROOM APARTMENT
- TWO BEDROOM APARTMENT

Scale 1:500



GROUND FLOOR PLAN
SCALE 1:500



FIRST FLOOR PLAN
SCALE 1:500



TYPICAL FLOOR PLAN
LEVELS 2-6
SCALE 1:500

The development is within a conservation area where its character is desirable to preserve. In which case, Welsh Slate has been specified to reflect the surrounding sea cliffs and the natural landscape of Wales. It is locally sourced reducing the environmental impact of the development and is a resilient material that is more than capable of withstanding the maritime conditions.



A lightweight aluminium rainscreen system was specified to reduce the loadings on the underlying building structure and foundations. From the site analysis, it was found that the site exhibits bedrock and little topsoil, therefore excavation for foundations would be a lengthy and costly process. The building has been stepped in harmony with the topography along with the careful choice of lightweight materials.



BACK ELEVATION
SCALE 1:500



LEFT ELEVATION
SCALE 1:500



RIGHT ELEVATION
SCALE 1:500

3000 grade Vitrabond has been specified as it offers environmental credentials with a recycled Content Contribution of 60%, while having a non combustible mineral core achieving the required fire resistance standards for the development.

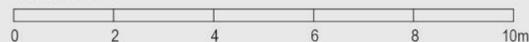
Precast Hollowcore Concrete Slab Floor finish on plywood board, supported on DeckFon acoustic battens, with 30mm Earthwool Acoustic Roll between battens and Nexxa underfloor heating pipes.

Welsh Slate Cladding Wall Supported on The CUPACLAD® 101 Logic system (Invisible fixings). Insulated with Earthwool non-combustible Rock Mineral Wool. The decision to use Welsh slate up to level 2 was to differentiate between workshop/office space and residential apartments. It was decided that the remaining envelope above level 2 will be constructed using lightweight facade materials like the chosen aluminum panels and standing seam roof incorporating PVL.



TWO BEDROOM DUPLEX APARTMENT
LOWER FLOOR PLAN
SCALE 1:100

Scale 1:100



TWO BEDROOM DUPLEX APARTMENT
UPPER FLOOR PLAN
SCALE 1:100

Level A4
11700

Rainscreen Cladding Wall with Vitrabond 4mm 3000 grade Aluminium Composite Cladding Panel (VB7020 Sparkling White), Supported on Nvelope NV1 Vertical Rainscreen Cladding System. Insulated with Earthwool Non Combustible Rock Mineral Wool, 80mm External side of sheathing, 150mm Between Metsec SFS

15mm Gyproc SoundBloc fixed to the under side of the precast hollowcore slab using a British Gypsum CasoLine MF Suspended Ceiling System. Steel beams fire protected with box encasement using Gyproc FireLine boards through a Gypframe FEA1 Steel Angle system, fixing the boards to the column flange and steel angles. The separating floors between apartments have been designed to achieve an airborne sound insulation value of 63dB and an impact sound insulation value of 45dB

The use of hot rolled steel frame and precast concrete flooring are ideal elements for the repetitive floor plan design, which allow for an ease of buildability while reducing the skill and labour required on site. The choice of structure allows for large clear spans with unobstructed floor space. Hollow core slabs reduce floor heights to ensure the building is below 18m which provided a lot more flexibility with fire safety.

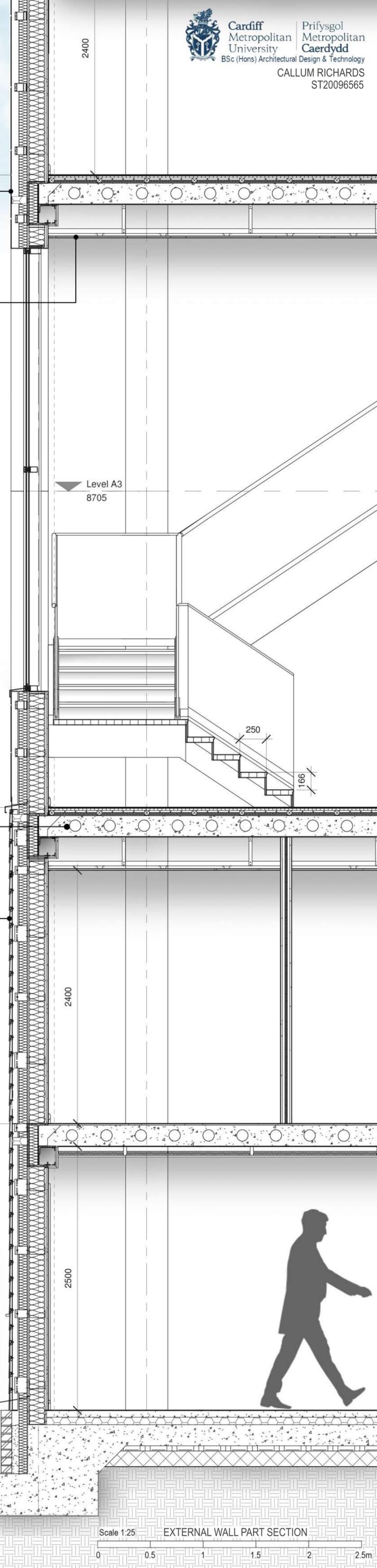
Level A3
8705

Level A2
5710

Level A1
2715

Level A0
0

FN Level A
-1000



Scale 1:25 EXTERNAL WALL PART SECTION

