07 Design: Layout Development

7.9 Early Building Massing

The below initial sketch massing options show how early space planning across the site was informed by both clinical spatial requirements and construction methodology. The development principles of clinical healthcare sites can often take a 'form follows function' approach, much is true for Llantrisant Health Park with clinical efficiency being a key driver, however there have been a number of additional priorities which required consideration.

Aside from clinical and construction efficiency, CTMUHB have driven the development of a health park facility which takes a human-scale approach, with domestic attributes and welcoming, calming spaces to facilitate the best possible patient experience. Importance has been placed on creating opportunities for both patient and staff access to nature, with considerate landscaping on site and preservation of far-reaching views to the hills and woodland beyond the site.

Additional key drivers for the site was the approach to preservation and reuse. Embodied carbon spent establishing the existing site in the 1990's has been a consideration; locations of existing infrastructure and services and flood risk areas were reviewed to limit potentially unnecessary alterations on site and further embodied carbon expenditure. This sustainable and considerate focus resulted in the proposed buildings replacing the existing within the same footprint, albeit in a much more efficient and clinically suitable arrangement. A number of considerations relevant to the each approach are as follows:

- Ability to use standard grids across the site, stacking clinical services for best efficiency and clinical standardisation.
- Consideration of NHS Net Zero and MMC guidance requirements for major projects.
- Theatres were developed as 4 in a row to facilitate a possible barn theatre arrangement.
- The CDH must be delivered in advance of the Surgical Hub and Recovery and be capable of full closure during non-operational hours. This initially meant the CDH was totally separate from the SH.
- Minimise building footprint but consider staffing ratios and arrangement of spaces accordingly for staff numbers.

It was agreed that Option A was most suitable for both construction and clinical efficiency, yet also created improved opportunities for external pedestrian access, external cafe and seating areas and high quality landscaping to facilitate better placemaking and site environment.

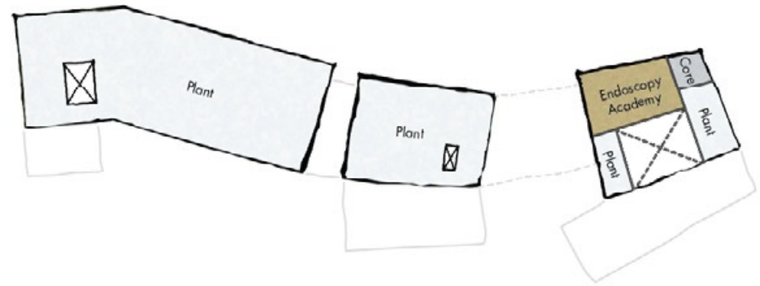
7.10 Early Building Layouts

The CDH is located north at the most constrained area of the site. This is close to the site entrance and car parking areas where patients are most likely to self-drive and utilise public transport.

Locating the vastly larger Surgical Hub towards the south of the site enabled deeper building depths to enable key clinical adjacencies.

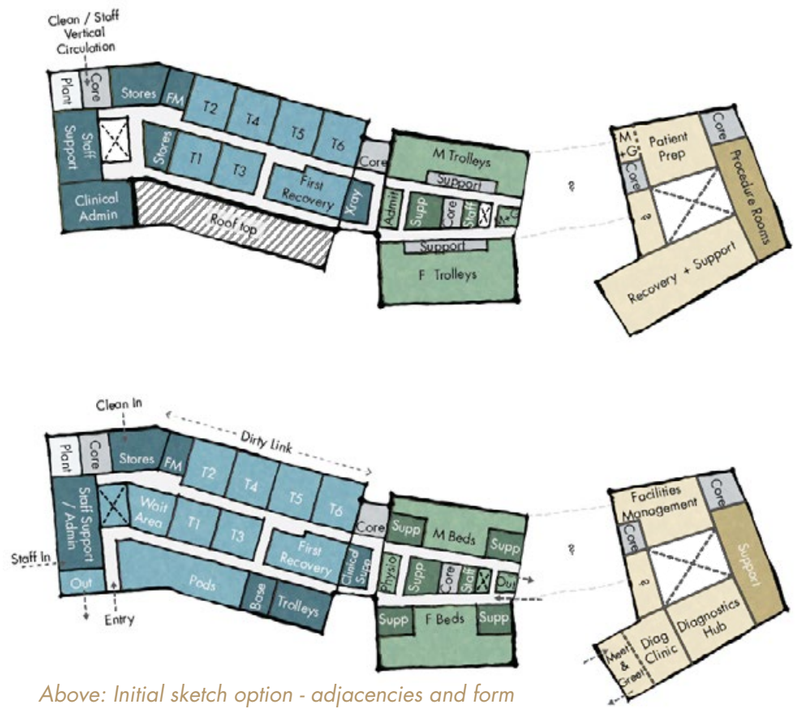
As the layout optioneering evolved, a direct link between the CDH and Surgical Hub became increasingly necessary to enable essential clinical, operational and fire safety links. Despite the introduction of this link, it was considered that a separate entrance for each Hub was still essential from an operational perspective and would aid in retaining a 'health park' feel, lessening patient perception and anxiety of what may otherwise be perceived as a large hospital building.

As such, two distinct entrances into the building were created to provide public separation between the two. It was intended to create a welcoming approach to the CDH, with an adjacent cafe and external seating space nearby. Further external spaces were considered within the building footprint, including courtyards within both CDH and SH areas, additionally staff-accessible roof terraces providing direct access out to external areas and enhancing staff well-being.



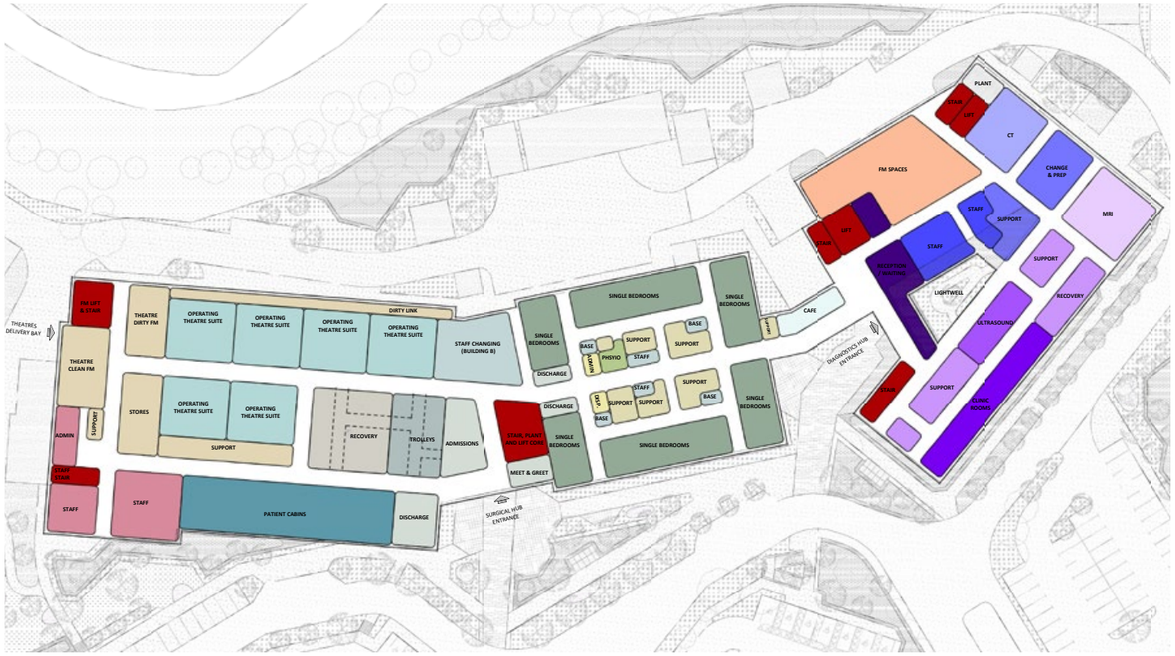
Above: Option A Initial concept massing options: Modular approach

Above: Option B Initial concept massing options: MMC-Hybrid approach



Above: Initial sketch option - adjacencies and form

07 Design: Massing Development



Above: Developed RIBA 2 Site Layout and Adjacencies

7.11 Building Massing and Height

The building form and massing is very similar in scale to the existing BAAE buildings, however the proposed design utilises a much more efficient layout to support the clinical need.

Careful consideration of the clinical adjacencies and resulting building footprint has lead the accommodation to be located across 2-3 storeys. The CDH building is the only accommodation with a second floor of accessible space. This is for skills academy delegates and staff only, locating non-clinical space at the highest point. All other buildings are 2 storeys as this aids arrangement of the schedule of accommodation to facilitate the most efficient staffing models.

As per the original BAAE buildings, all departmental roof areas are enclosed or external plant spaces. To meet the sustainability demands for the project, over all enclosed roof spaces is accessible PV roof deck. Here a vast array of PVs is accommodated to support the energy demands of the site.

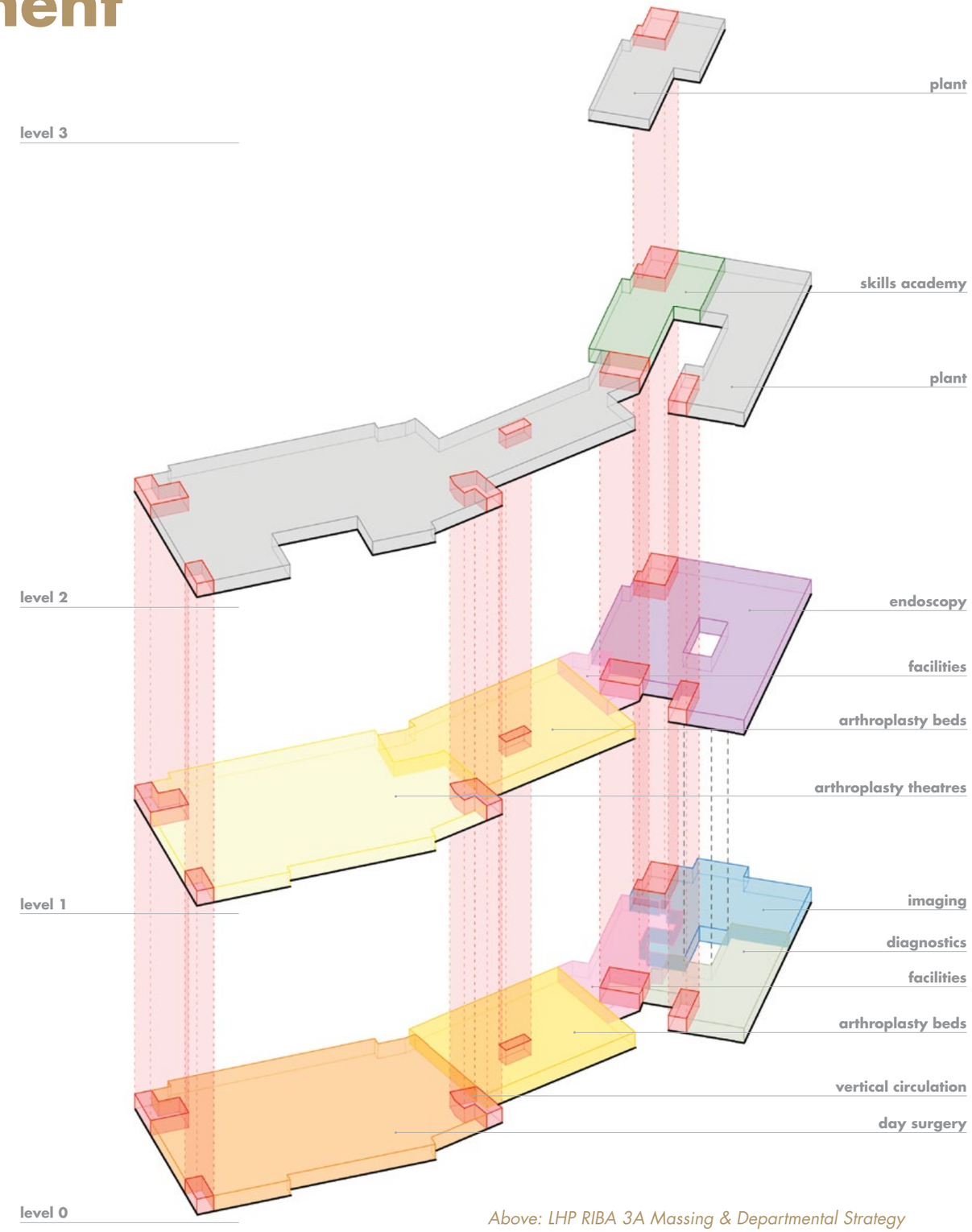
The building is set back from the site boundary, on the existing BAAE building footprint, approximately 60m away from the site boundary and public highway. The set-back and scale is not opposing in appearance and perspective from the boundary and varies very little from the previous buildings.

The scale and massing of the proposals is in keeping with the previous and surrounding context of the site. The vast majority of industrial, commercial and healthcare buildings in the locality are all 2 storeys + plant accommodation, mirroring the scale of the Royal Glamorgan Hospital, Medi-Campus, Premier Inn and nearby Business Park.

The accompanying visualisations later in section 7 of this design and access statement illustrate that the proposed scale of the development, that it is appropriate for its context and avoids detrimental landscape impacts, provides a welcoming environment at key access points and enhances the landscape and biodiversity of the site.

The layout of the development responds to the constraints and opportunities of the site, makes best use of the outstanding local views for patient and staff benefit and uses the existing infrastructure available, including main highways access.

The adjacent axonometric diagram illustrates the massing at the completion of RIBA 3, the adjacencies of departments, associated links and vertical circulation routes.



Above: LHP RIBA 3A Massing & Departmental Strategy

07 Design: Proposed GA Plans (Community Diagnostics Hub)

7.12 Ground Floor: Facilities Management & Diagnostics

The CDH is entered at ground floor via a large draught lobby which accommodated some ad-hoc seating and digital self-service check in bays; patients will be virtually directed to ground or first floor waiting areas. The entrance links to a large waiting space with views to a planted courtyard/light-well. This courtyard also serves as an external break-out space, enhancing the staff environment.

Patients will be digitally called through to a smaller sub-wait in Diagnostics Clinic or the Imaging Department. The layout designed facilitates high patient throughput, limiting down-time between appointments. Ground floor clinical spaces include: Consultation, Interventional Treatment, Ultrasound, MRI, CT rooms and supporting areas.

An externally-accessed cafe space provides internal and external seating. The cafe is located adjacent to the CDH having increased footfall and with most Surgical Hub patients being nil-by-mouth on arrival. A ground floor Facilities area provides central consumables, catering stores, disposal and an inpatient pharmacy hub.

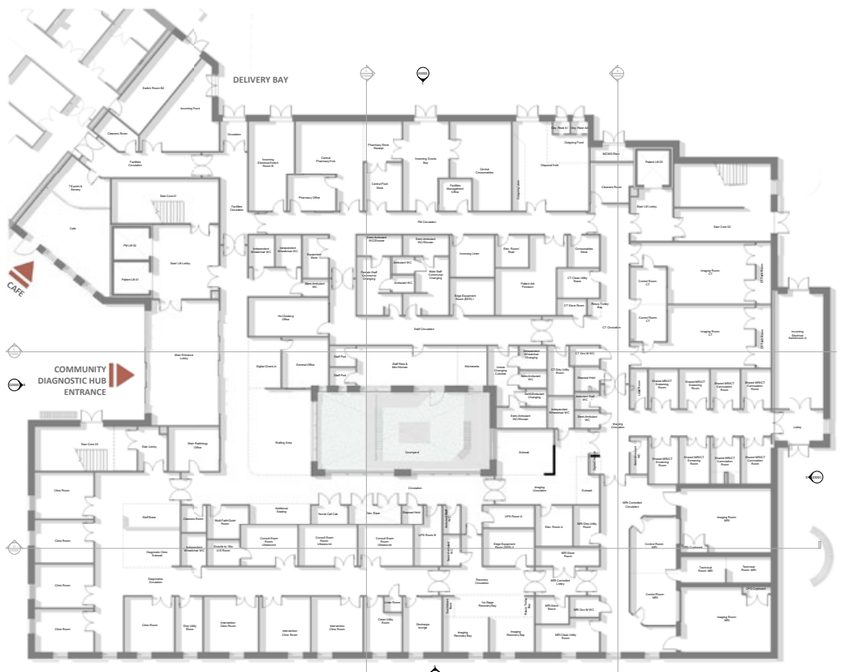
7.13 First Floor: Endoscopy

Endoscopy patients will travel to first floor and arrive in a dedicated waiting space. Patients will be called through to prep rooms and subsequently onto a split-gender changing/ sub-wait. This sub-wait leads directly onto the 'clean' procedure room circulation, with 'dirty' back of house links to the rear.

Patients will move post-procedure into a split-gender recovery area and/or shared discharge lounge space. The unit has been designed to ensure full compliance with JAG and facilitate patient dignity, with a separate building exit route for patients if required.

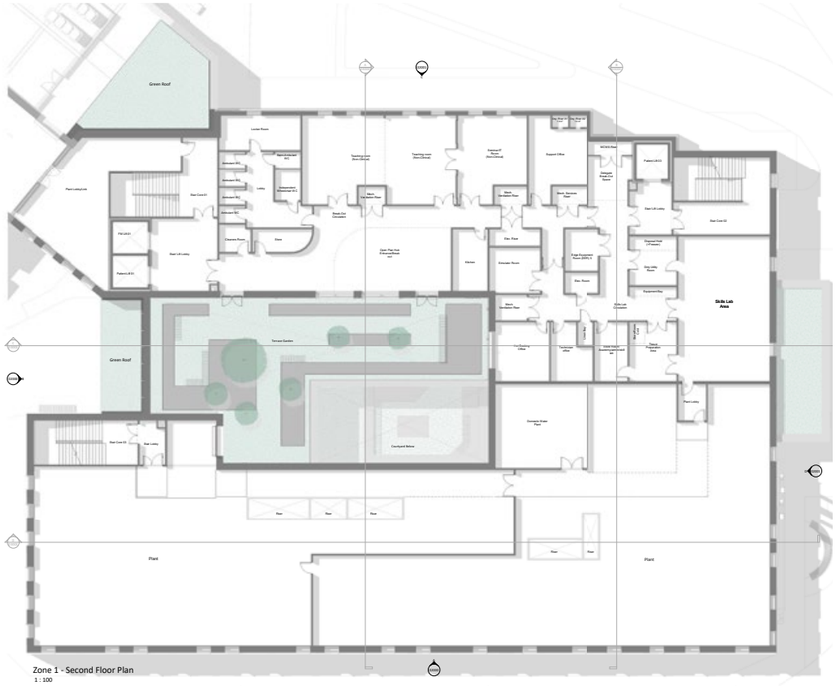
7.14 Second Floor: Skills Academy

The first floor skills academy features large teaching and seminar spaces, practical skills laboratories and an open external terrace for staff and delegate use. Spaces in area will be bookable for use by others across the site.

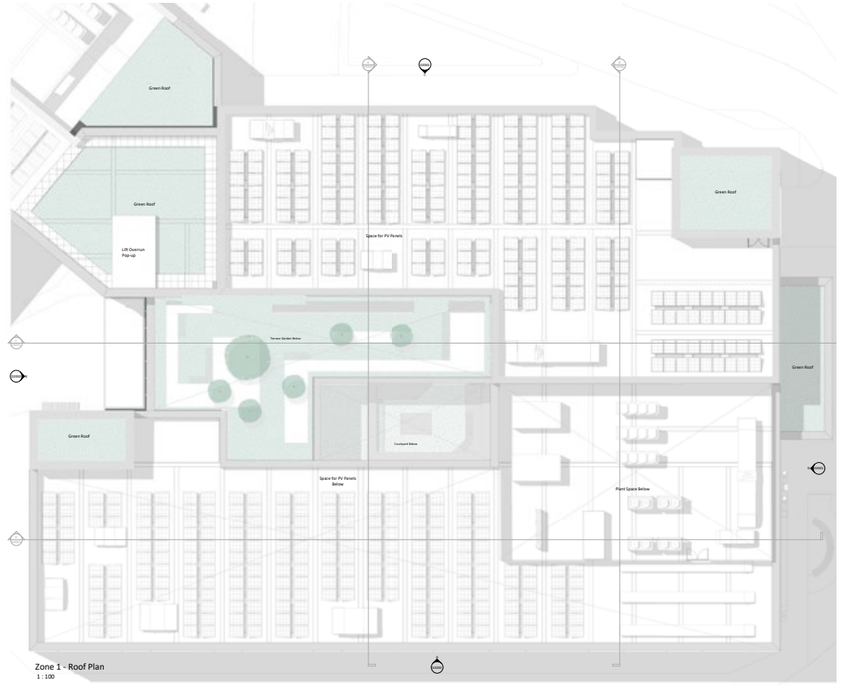


Zone 1 - Ground Floor Plan
1 : 100


Zone 1 - First Floor Plan
1 : 100

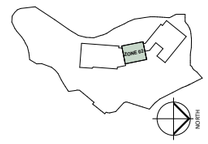


Zone 1 - Second Floor Plan
1 : 100



Zone 1 - Roof Plan
1 : 100

07 Design: Proposed GA Plans (Surgical Hub: Recovery)

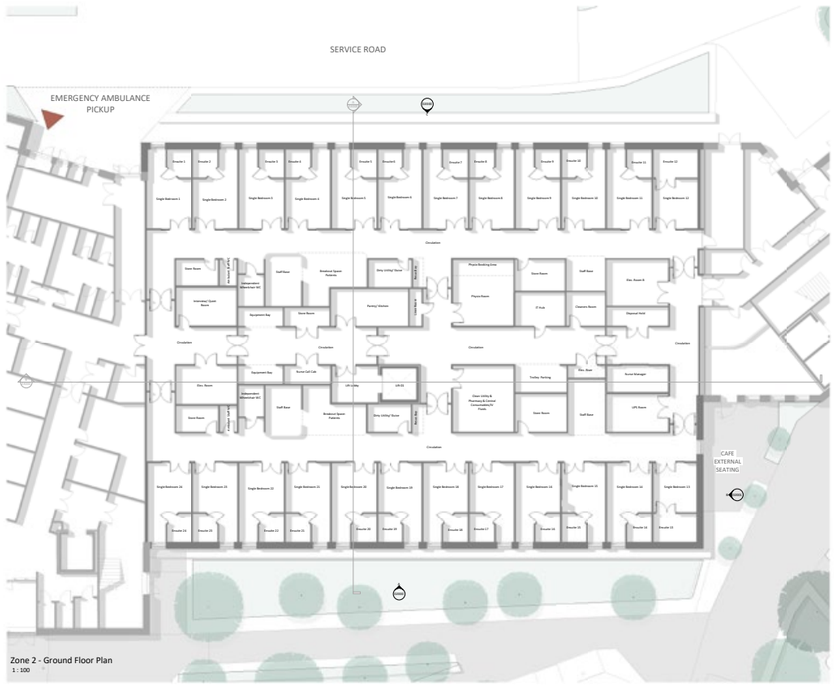


7.15 Ground Floor: Arthroplasty Ward Day 1+ Length of Stay

This level is in fact the final space of the Arthroplasty patient journey. Here, patients will have had their surgery and have already spent 0-1 days in the first floor recovery ward above. The ground floor will accommodate patients who require a little more recovery time prior to discharge. This bedded ward provides some capacity, maintaining the drive and clinical throughput for Theatres.

The ground floor space will function as one large ward with staff movement between each side; this is especially critical during the night where there may be reduced staff and patient numbers. All bedrooms are private with views to outside through full height windows out to the landscape beyond. Patients will be discharged from relaxed, communal lounge spaces, adjacent to staff bases for observation; these areas should be domestic and comfortable in their design.

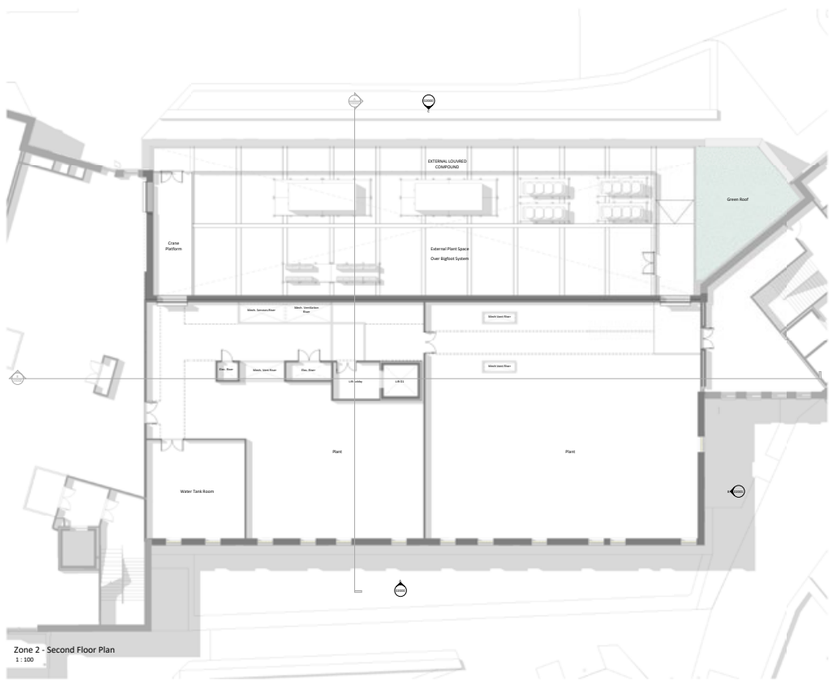
Ground floor areas have been designed in a way to enable flexibility with future use potential as an outpatients clinic for example, offering adaptability for changeable service requirements.

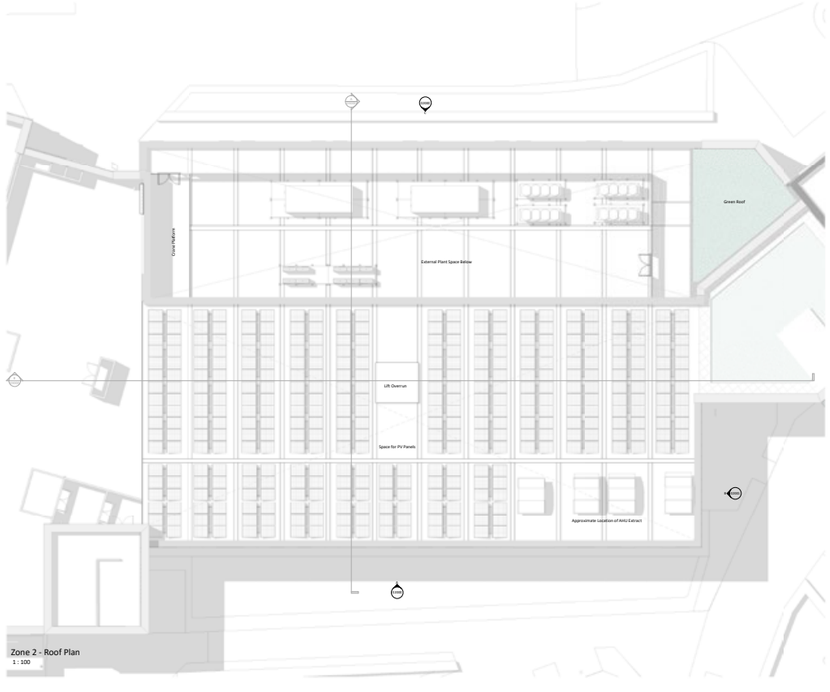


7.16 First Floor: Arthroplasty Ward Day 0-1 Length of Stay

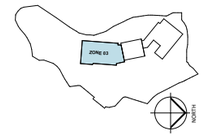
This level is the primary recovery space for Arthroplasty patients returning from theatre. Here patients will spend 0/1 days on the open ward, which is gender segregated. The benefits of an open ward are good nursing observation and camaraderie between patients. It has been shown in similar units that this approach facilitates quicker patient recovery time and ultimately patient throughput. Patient spaces on this level benefit from floor to ceiling windows with views out to the landscape from the bed. It is expected that most patients will be discharged directly from the first floor ward, exiting the Surgical Hub via the main building entrance.

Staff changing and generous rest areas are provided for both floors, with large windows and a range of comfortable social, dining and seating areas.





07 Design: Proposed GA Plans (Surgical Hub: Theatres)

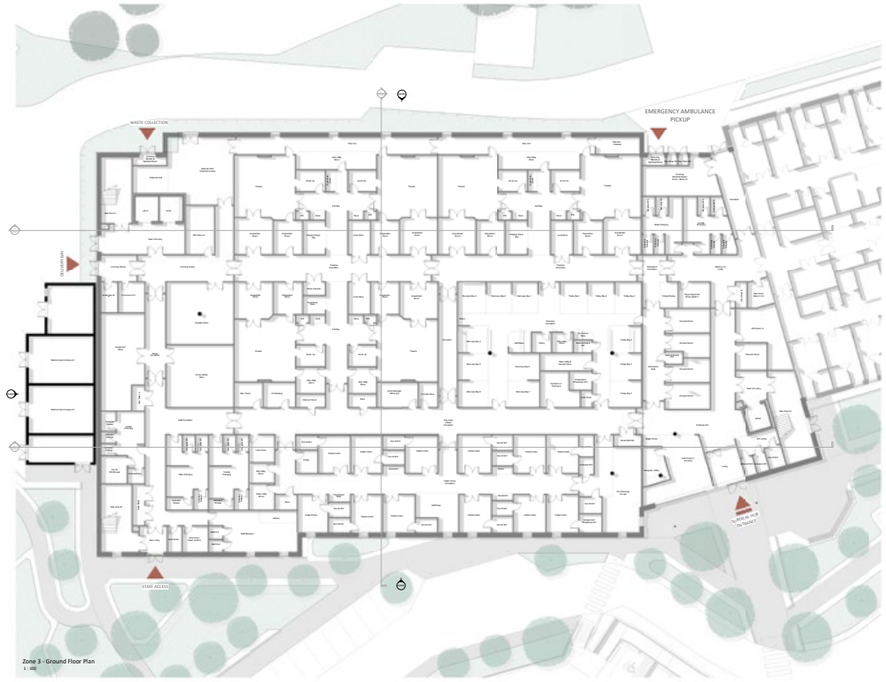


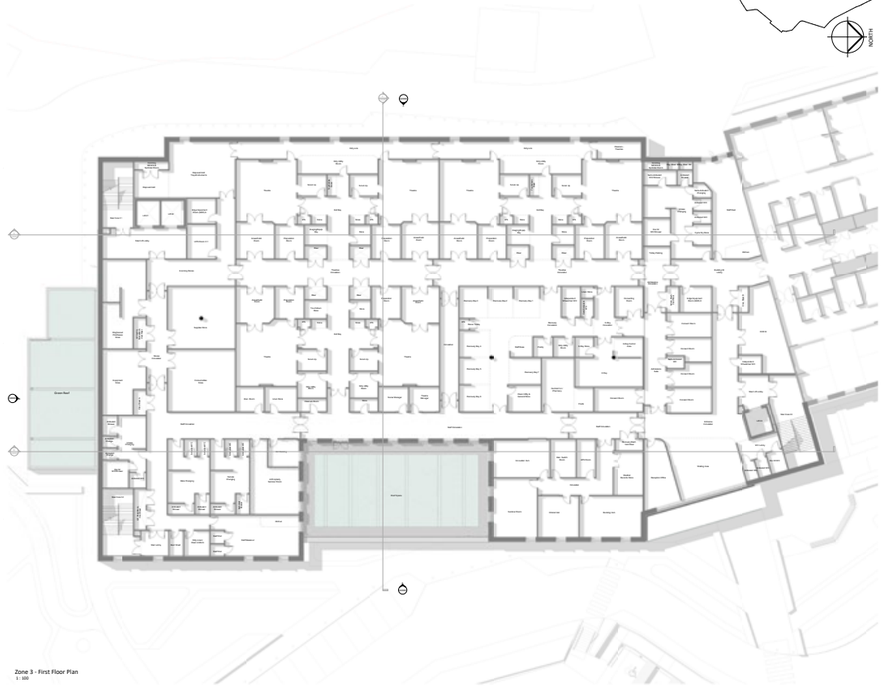
7.17 Ground Floor: Day Surgery Unit

Patients for both services within the Surgical Hub will arrive at ground floor via the draught lobby and register their arrival at a digital self-service check in bay. Patients will be virtually directed to the waiting areas at ground or first floors respectively.

Day Surgery patients will wait in the bright, naturally lit reception area, with expansive views to surrounding landscape, and called into a private consenting room to prepare for theatre. Patients will be taken directly to theatre from here, keeping the patient journey to a minimum and ensuring environments are comfortable and calming.

There are 6 Day Surgery theatres and following surgery, patients will go to an open first stage recovery area with good staff observation. Patients will move onward to recover in a patient cabin, ensuring privacy and comfort. The patient cabin spaces link directly through to a bright and spacious discharge lounge, again with a range of comfortable seating and views out.

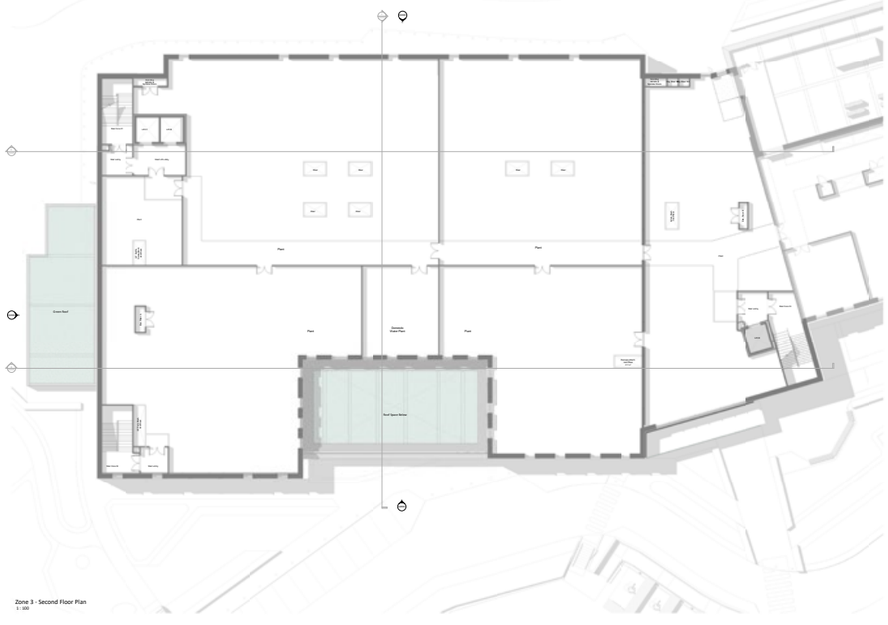


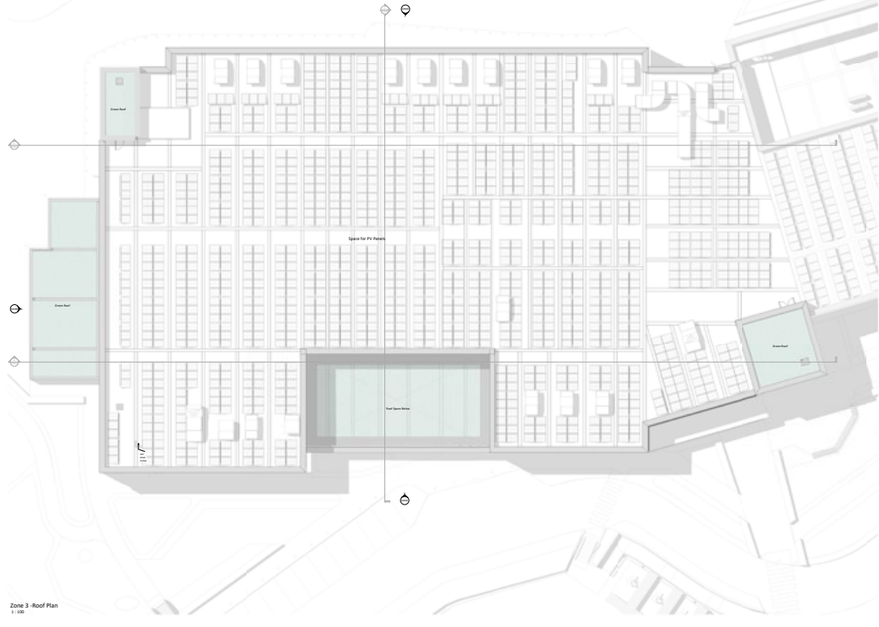


7.18 First Floor: Arthroplasty Surgery Unit

Patients will have been virtually directed to first floor where a large, open reception and waiting area is located, again with large windows and views out to the landscape and trees. As with the ground floor, patients will be called into a private consenting room to prepare for theatre. Patients will be taken directly to theatre from here, keeping the patient journey to a minimum and ensuring environments are comfortable and calming.

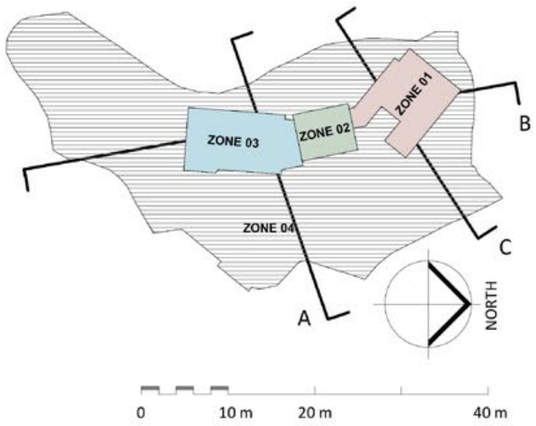
There are 6 Arthroplasty Surgery theatres and following surgery, patients will go to an open first stage recovery area with good staff observation. Patients will move onward the adjacent Arthroplasty Recovery ward, in Zone 2, to recover in the first floor open ward space. Patients may be discharged directly from the first floor ward if appropriate, however if patients are required to stay longer, they will be transferred to ground floor via a dedicated lift within the ward footprint, ensuring maximum patient dignity.





07 Design: Proposed Sections

Site Section A-A
1 : 500



Site Section B-B
1 : 500

Site Section C-C
1 : 500

7.19 Site Sections

The above site sections indicate how the building sits on the site. The site is relatively flat as it was made up ground for the previous BAAE project. This has been beneficial to the Llantrisant Health Park scheme, enabling level links between buildings for staff and patient access and with minor impacts to the existing ground levels on site, reducing ground works and aligning with the projects sustainability principles. Retaining the existing levels on site has additionally enabled the reuse of the surrounding site infrastructure, with existing access road levels tying into the proposed development setting out bringing additional benefits in reuse and embodied carbon reduction.

The site drops away towards the south of the buildings and into a grassy area which is proposed to be utilised as a wetland as part of the overall SuDS/SAB strategy for the site. Within this area there will be staff well-being walking routes and resting places, utilising the wetland basin, enhancing biodiversity and encouraging staff to access nature. Refer to Section 8 Landscape for further information.

7.20 Maximum Building Heights

Zone 1: Upper height - 21.55m (to top of stair core)

Zone 2: Upper height - 14m

Zone 3: Upper height - 16m (to top of stair core)

07 Design: Materiality

The following demonstrates materials and colour palettes proposed to be adopted on the Llantrisant Health Park site. The intent is to reflect materials used in healthcare buildings locally, but with a more contemporary approach, reinforcing that the building strategy is designed to clinically push the boundaries of elective care in the region. Adopting more of a 'health-park' approach rather than a 'large-scale-hospital' style, we have considered that materials more domestic and robust would be most appropriate, helping ground the buildings within the landscape.

7.21 Material Strategy

Utilising a large format rainscreen cladding system, over low level brick slip systems offers clear advantages. It allows efficient construction with elements spanning floor slab to floor slab, as such reducing secondary steelwork requirements and giving multiple opportunities for MMC. The full height windows will include tinted glazed spandrel panels to balance the relatively small size of the windows with the extent of solid façade. This approach will create a more balanced and coherent fenestration.

Utilising a range of smooth and folded aluminium cladding panels will bring interest to what is otherwise an expansive elevation. Additionally extruded aluminium fins in 2No. distinctive colours (as indicated below or as similar approved) will aid with defining each hub identity and patient wayfinding on the site. Locating brick slips at ground floor (as indicated below or as similar approved) will help ground the building and reinforce the feeling of robustness and give texture and interest to solid areas of façade.

Material selection should take a 'fabric-first-approach', ensuring that sustainable and low embodied carbon materials are used where possible and take priority over other less sustainable options. Agreed project carbon limits form the threshold at which our material selection and its embodied carbon are benchmarked against, exploring at each design stage if betterment of the design is possible.

Omagh Hospital & Primary Care Complex

ABCAM Centre

Crown Point Hospital, Indiana, USA

CDE, Charlottesville, USA

7.22 Elevation Optioneering

The above elevations demonstrate facade optioneering undertaken at RIBA 2 to explore different material palettes and how they worked from both an MMC/construction perspective, but also with the site setting, building use and wayfinding aspects. Of numerous variations and facade options explored, it was considered that, due to the height of the building a ground floor brick plinth, with cladding over which emphasises verticality and mirrors the trees and landscape surrounding the site would be the preferred way forward.

7.23 Elevation Development

The below panoramic elevation shows how, in earlier design stages, we explored various ways in which the preferred elevation option could be applied to the buildings. The site is long and expansive, with a very consistent height across most zones. The consistency in height is a requirement for clinical adjacencies, however this makes defining the hubs as individual areas challenging. There is a need to differentiate the Community Diagnostics Hub and Surgical Hub from one another as patients will not move between the two areas, however in equal measure there is a need for cohesiveness and consistency across the site.

It was determined that brick slips to lower levels would be continuous across all buildings, reinforcing robustness and grounding the buildings. Lower windows contained to within the ground floor, giving vertical separation and ensuring a more human scale is achieved over the large 4.8-5m floor to floor heights. The facade has been further grounded by introduction of slightly darker brick plinth, where several courses sit at ground level, below the primary buff brick, reflecting the colours of local stonework features on some nearby buildings.

We have explored the slightly darker brick identifying primary stair cores on front elevations, which aids in identifying each entrance and provides a clear and uninterrupted backdrop for wayfinding signage.

Upper floors to Zones 01 and 03 will feature metal folded rainscreen cladding in a combination of ribbed and smooth panels, whereas upper floors to Zone 02 will be lighter buff brick slips to compliment the rainscreen cladding yet provide visual separation. Feature colour projecting fins help identify each building as a separate service. This colour accent will be evident at the building entrances and reinforced through external wayfinding strategies, leading through to internal spaces.

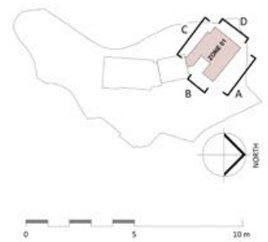
Plant areas will be identified by a dark grey aluminium rainscreen cladding. These areas will feature a combination of smooth panels and ventilating louvres for services within the enclosed space behind. The combination of panel textures will mirror the combination of smooth and ribbed panels used on the main facade areas. To the rear of the site, where access is private and views are limited, it is proposed that an insulated sandwich panel replaces the primary rainscreen cladding.

Below: Planning pre-application massing and elevations

07 Design: Proposed Elevations (Community Diagnostics Hub)

GA East (Front) Elevation A
1 : 100

GA South (Side) Elevation B
1 : 100



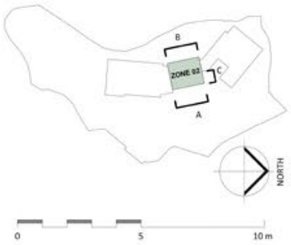
Zone 1 - Material Key:

- A Brick Slips on carrier system - Buff Tones
- B Rainscreen Cladding Flat and Ribbed panel - RAL TBC
- C Aluminium Louvers with solid aluminium panel - RAL TBC
- D Aluminium Windows - RAL TBC
- E Aluminium Doors - RAL TBC
- F Parapet Capping - RAL TBC
- G Aluminium Acoustic Louver Screen - RAL TBC
- H Insulated sandwich panels - TBC
- J Terrace Balustrating Metal Flat Fins - RAL TBC
- K Entrance Canopy - Extruded Aluminium Canopy Fascia - RAL TBC
- L Curtainwall Extruded Mullion Facecaps - RAL Colours TBC
- M LED Exterior Building Signage - RAL TBC
- N Cat ladder
- O Trapezoidal Inner Parapet Cladding RAL TBC
- P MRI Knock-out Panel Locations

Below: Internal courtyard elevations

07 Design: Proposed Elevations (Surgical Hub: Recovery)

GA East (Front) Elevation A
1 : 100



Material Key:

- A Brick Slips on carrier system - Buff Tones
- B Rainscreen Cladding - RAL TBC
- C Aluminium Louvers with solid aluminium panel - RAL TBC
- D Aluminium Windows - RAL TBC
- E Aluminium Doors - RAL TBC
- F Parapet Capping - RAL TBC
- G Aluminium Acoustic Louver Screen - RAL TBC
- H Insulated sandwich panels - TBC
- J LED Exterior Building Signage - RAL TBC

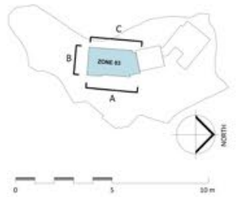
GA West (Rear) Elevation B
1 : 100

07 Design: Proposed Elevations (Surgical Hub: Theatres)

GA East (Front) Elevation A
1 : 100

GA South (Side) Elevation B
1 : 100

GA West (Rear) Elevation C
1 : 100



Zone 3 - Material Key:

- A Brick Slips on carrier system - Buff Tones
- B Rainscreen Cladding Flat and Ribbed panel - RAL TBC
- C Aluminium Louvers with solid aluminium panel - RAL TBC
- D Aluminium Windows - RAL TBC
- E Aluminium Doors - RAL TBC
- F Parapet Capping - RAL TBC
- G Aluminium Acoustic Louver Screen - RAL TBC
- H Insulated sandwich panels - TBC
- J Terrace Balustrating Metal Flat Fins - RAL TBC
- K Entrance Canopy - Extruded Aluminium Canopy Fascia - RAL TBC
- L Curtainwall Extruded Mullion Facecaps - RAL TBC
- M LED Exterior Building Signage - RAL TBC

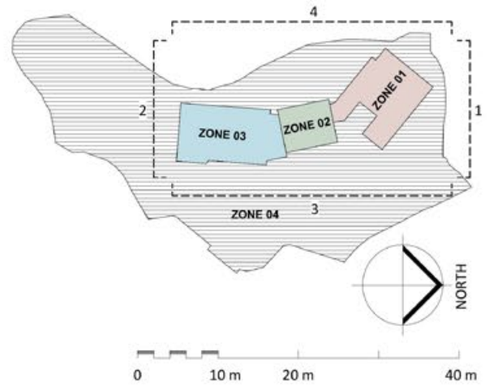
07 Design: Site-Wide Elevations

1 Site North (Side) Elevation
1 : 500

2 Site South (Side) Elevation
1 : 500

3 Site East (Front) Elevation
1 : 500

4 Site West (Rear) Elevation
1 : 500



07 Design: Typical Bays

7.24 Elevation Optioneering

The new building is designed to be simple and contemporary in it's architectural style, reflecting similar use buildings in the locality and enabling the design to implement the principles of the NHS Net Zero Buildings Standard which has set requirements regarding thermal performance and air tightness.

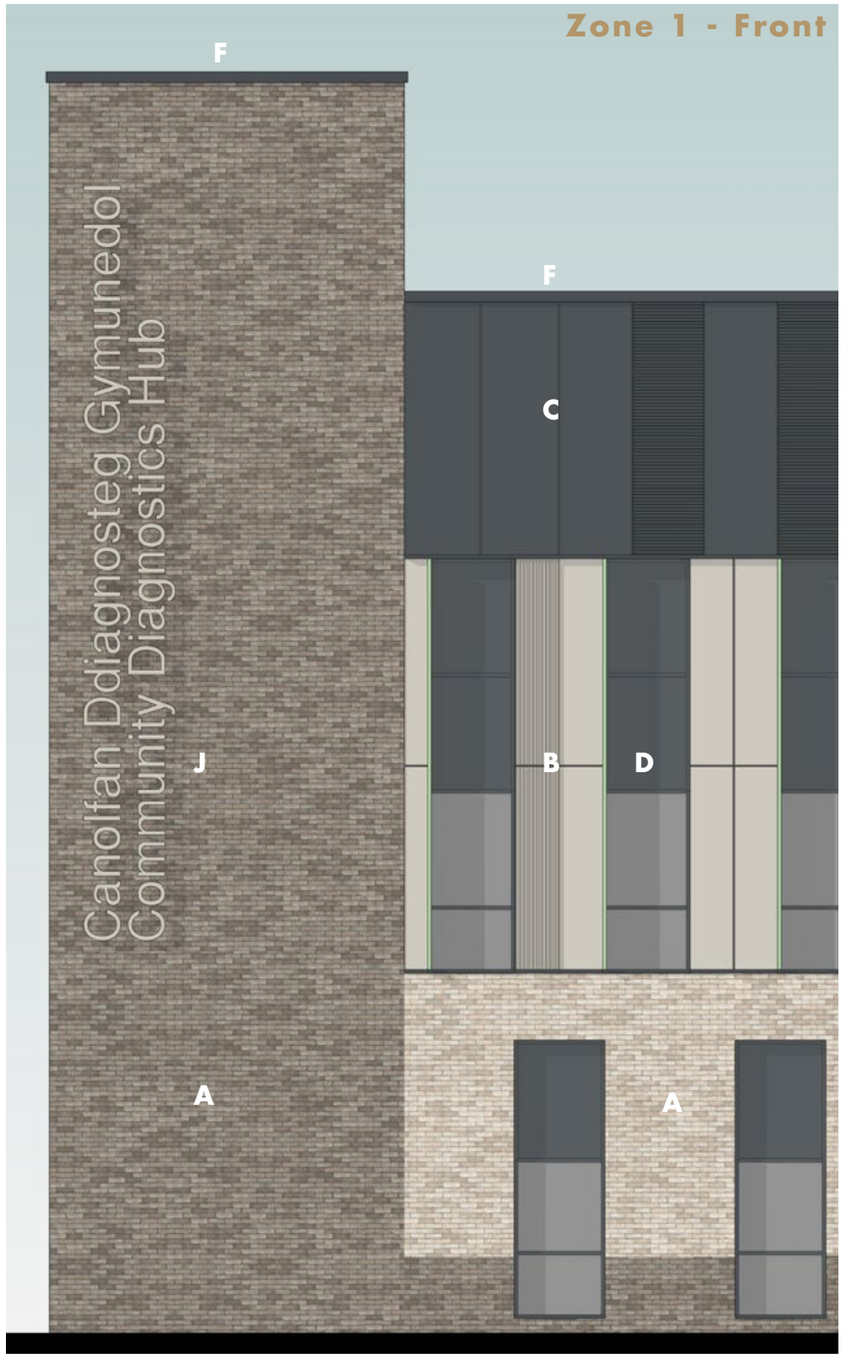
The building is proposed to be clad in brick-slips and aluminium rainscreen cladding in a range of ribbed and smooth panels, both of which are robust, and will require minimal ongoing maintenance for the health board. The darker brick plinth colour mimics the stone cladding used locally and is carried up primary entrance stair cores to create a visual sign-post for each Hub and accommodate LED back-lit building signage in both Welsh and English language.

Each hub has a subtle accent colour located on extruded aluminium profile fins alongside full height windows. The use of two colours provides an indication of separate buildings accommodating separate services and will be referenced in the site-wide wayfinding strategy and carried through into interior design strategies as appropriate.

All colours are to be confirmed via condition and brick mortar should be colour matched.

Material Key:

- A — Brick Slips on carrier system - Buff Tones
- B — Rainscreen Cladding - RAL TBC
- C — Aluminium Louvers with solid aluminium panel - RAL TBC
- D — Aluminium Windows - RAL TBC
- E — Aluminium Doors - RAL TBC
- F — Parapet Capping - RAL TBC
- G — Aluminium Acoustic Louver Screen - RAL TBC
- H — Insulated sandwich panels - TBC
- J — LED Exterior Building Signage - RAL TBC



07 Design: Typical Bays

7.25 Elevation Optioneering

To separate the rhythm of the brick plinth and rainscreen cladding above, the Arthroplasty Recovery building (zone 2 which is central on the site) will feature full height brick slips.

The darker brick will finish at first floor level, with the lighter buff brick above to maintain the visual principles for the site, however the extended darker brick plinth will create a visual separation between Hubs at human eye level.

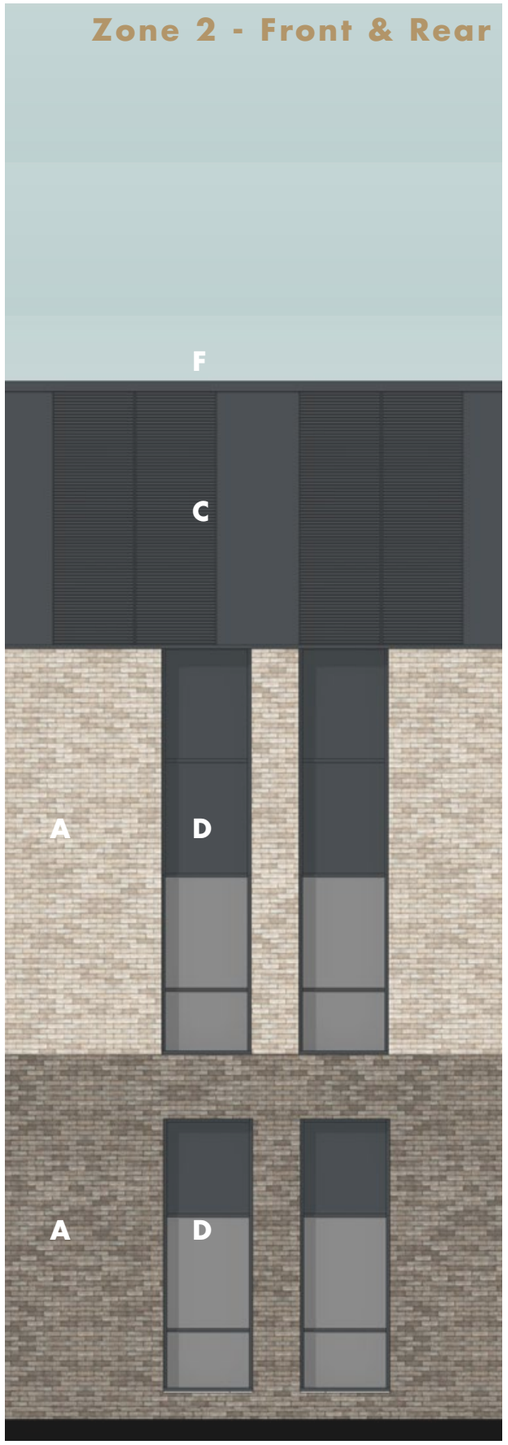
The darker grey aluminium rainscreen plant level and parapet is continuous across all buildings with louvered sections connecting directly back to ventilation equipment.

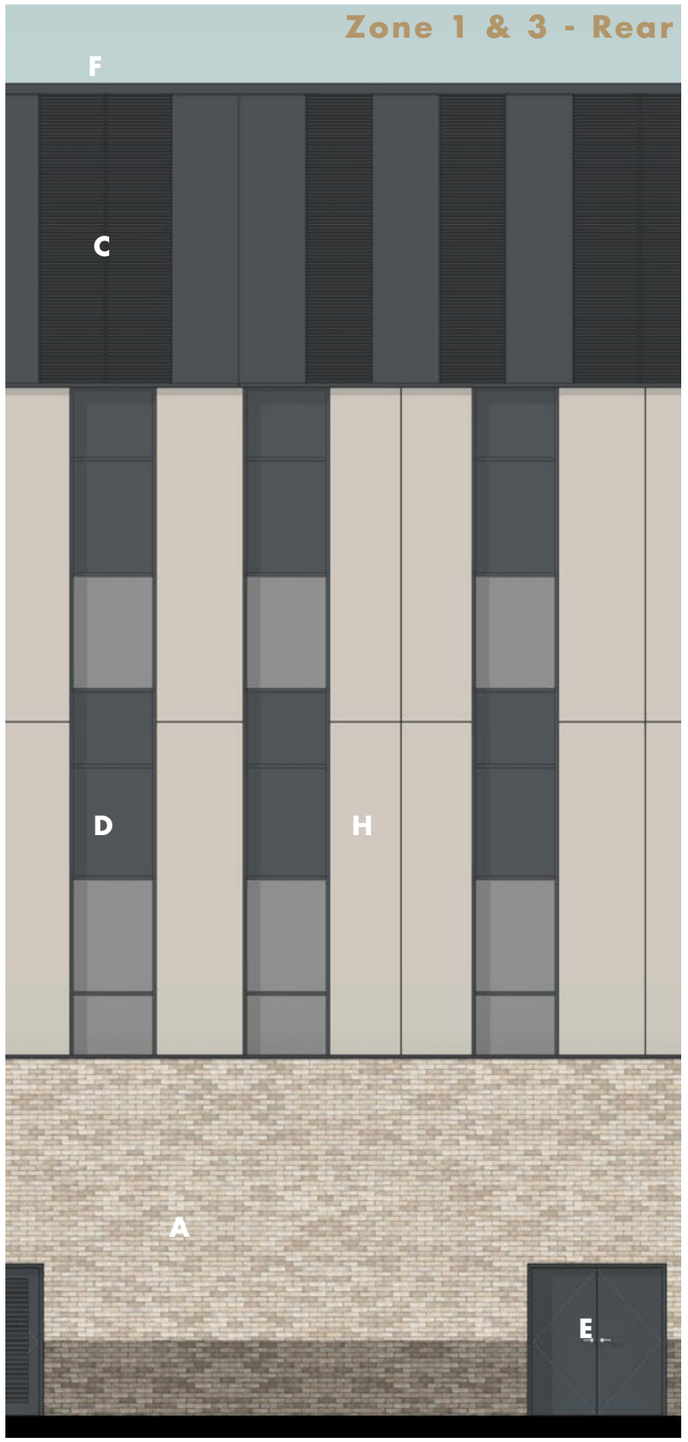
Towards the rear of the site, access is private only for staff and deliveries, views from the woodland above are predominantly of the roof and not the rear elevations. As such, it has been proposed that higher quality materials take focus on the front elevations, with a colour matched insulated sandwich panel to the rear cladding areas. A brick plinth is maintained at ground floor on all buildings around the site both front and back, with zone 2 rear elevation in full height brick as per the front elevation.

All colours are to be confirmed via condition and brick mortar should be colour matched.

Material Key:

- A — Brick Slips on carrier system - Buff Tones
- B — Rainscreen Cladding - RAL TBC
- C — Aluminium Louvers with solid aluminium panel - RAL TBC
- D — Aluminium Windows - RAL TBC
- E — Aluminium Doors - RAL TBC
- F — Parapet Capping - RAL TBC
- G — Aluminium Acoustic Louver Screen - RAL TBC
- H — Insulated sandwich panels - TBC
- J — LED Exterior Building Signage - RAL TBC





07 Design: Proposed Visual - Site Approach