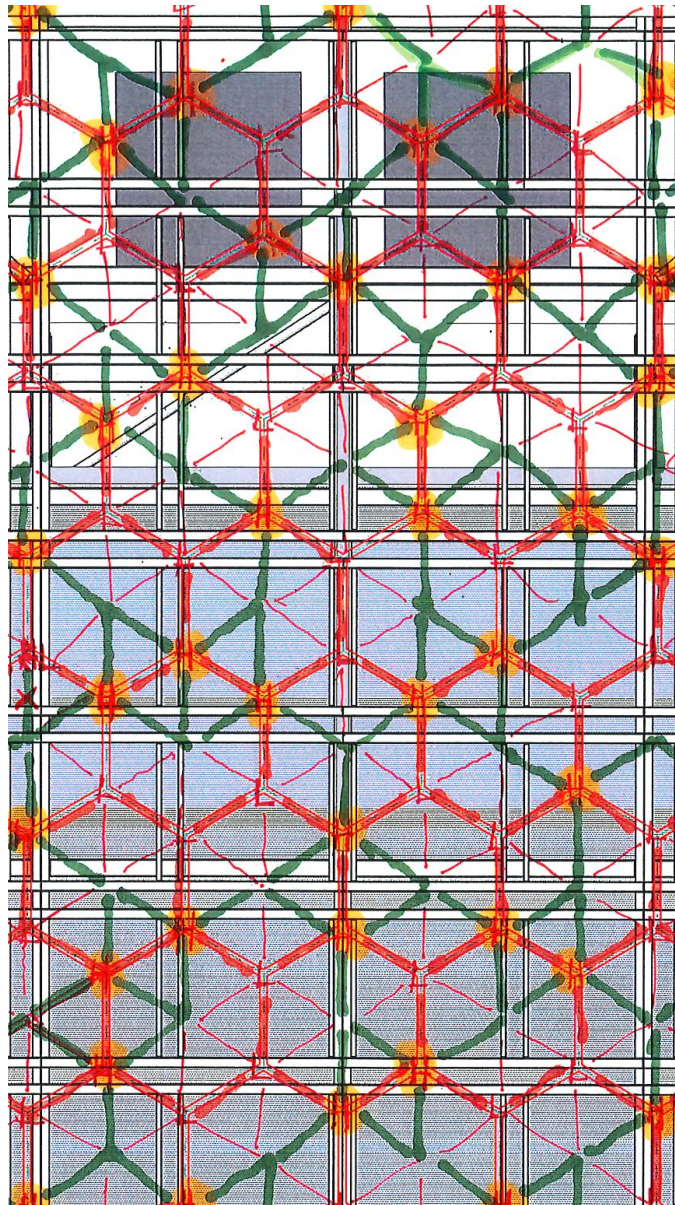


3.0 | Design

3.4 | Appearance



Shroud development

The `shroud` is a lightweight aluminium cladding system, composed of individual anodised hexagonal panels. We have collaborated with the manufacturer to develop the arrangement proposed.

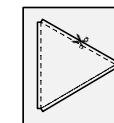
Each panel is formed of 6 triangular panels, welded together to form the hexagon.

To deliver the articulation, movement and interest in the facade, the panels are a three dimensional profile, with low points and high points differing by 300mm. Whenever the facade is struck by natural or artificial light, facets of each panels will appear in varying degrees of light and shadow. Refer to image **01** which illustrates part of the design process WM carried out to determine high and low points on each panel, as high and low points on adjacent panels must abut to avoid unintentional gaps being created.

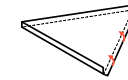
We have noted that the Energy Centre is a statement building with respect to its functional intent and prominent site at the border between University estate and public domain. With this in mind, we are proposing that the building is also given presence in darkness with the introduction facade lighting. Currently we propose this to be sited within the site. The detail will be developed in Stage 4.

Although the panels are bespoke, in the interests of cost control there are a limited number of variants. Refer to adjacent illustration of the design review carried out, **02**. Variety in the facade is achieved through defined placement and rotation of the panels.

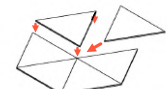
02



Triangles are cut from sheet aluminium, and are sized to minimise waste



Edges are folded up to provide rigidity and fixing points to the panels

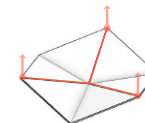


Six triangles are fixed together with rivets to form a hexagon

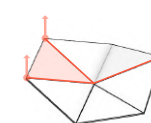


The final panel is anodised to achieve the desired colour and shipped to site

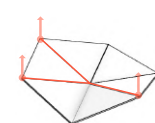
Variance and texture is achieved by raising 3 out of 6 corners on each panel by 300mm. This results in 4 different panel types.



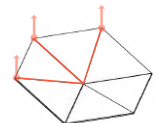
TYPE A



TYPE B



TYPE C



TYPE D

Each panel type can be installed in 6 different rotations, arranged in such a way that parallel edges between adjacent panels always match.



TYPE B_1



TYPE B_2



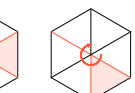
TYPE B_3



TYPE B_4



TYPE B_5



TYPE B_6

3.0 | Design

3.4 | Appearance

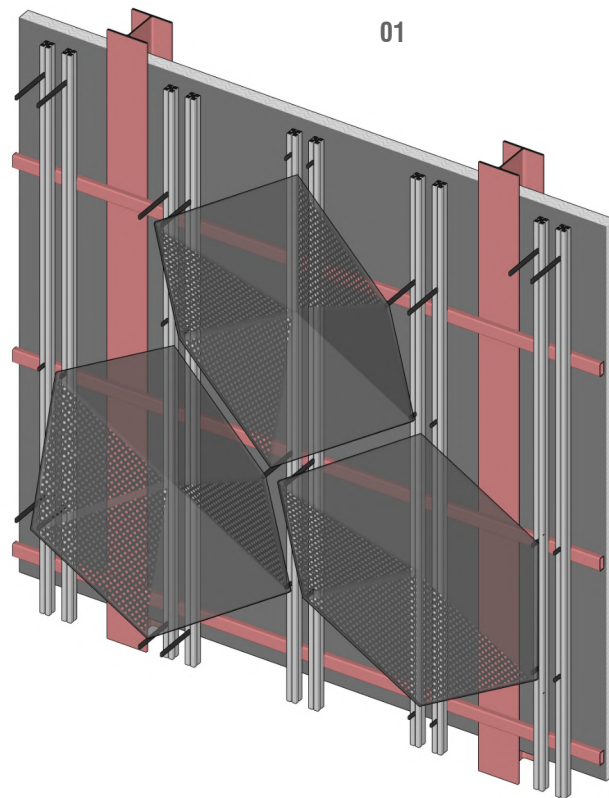


Image **01** is an extract of the shroud installation, indicating the primary steel (red) and the shroud sub frame. Note, the panels are shown semi transparent to assist clarity. It is anticipated that in the completed installation very little of the rails will be visible. The grey panel between the primary steel indicates the installation of acoustic boarding.

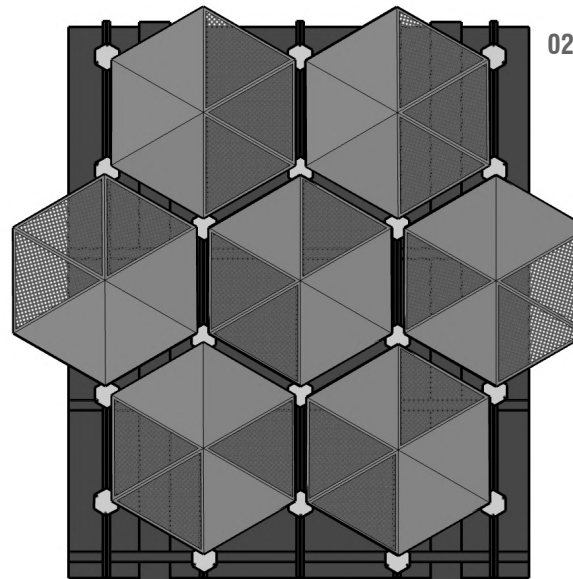
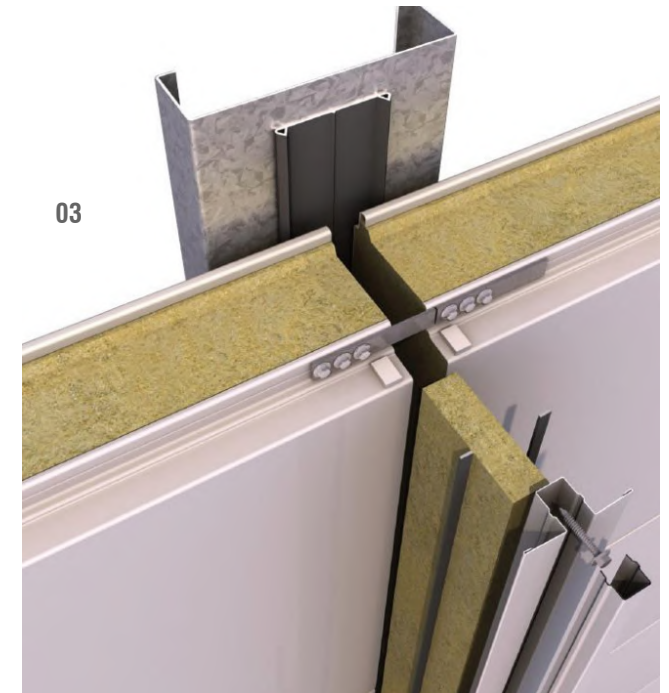


Image **02** is an extract of shroud cladding, identifying hexagonal steel plates behind and at the intersection of the large aluminium panels.

Image **03** is an illustration of the composition and construction of the cladding panels which form the thermal envelope of the building.



3.0 | Design

3.4 | Appearance

CLADDING (THE 'SHROUD')

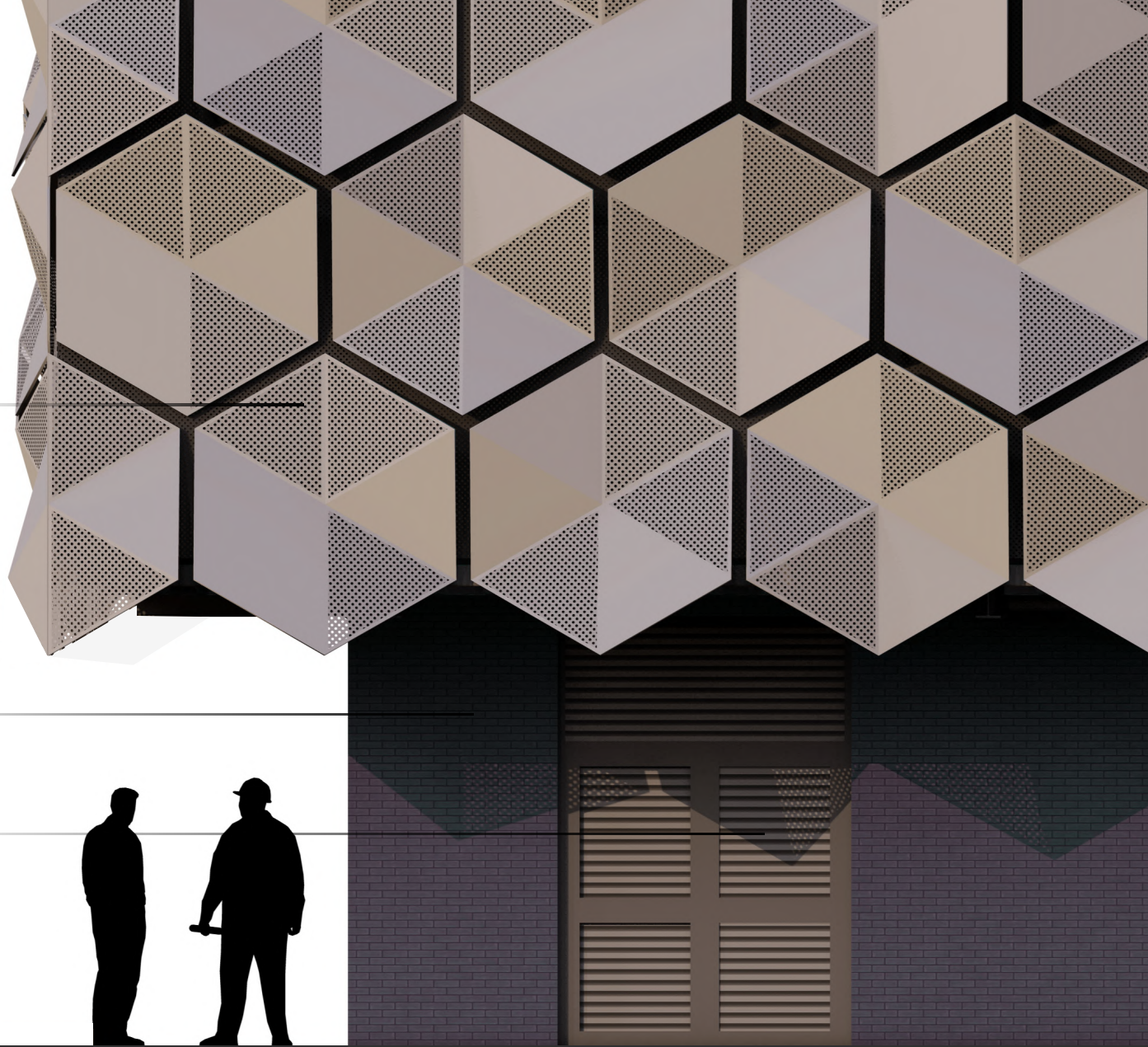
The shroud material is perforate aluminium sheet,
Coloured anodised finish.
The hexagonal panels are approximately 1900mm across

BRICKWORK

A dark engineering brick, with dark
mortar.

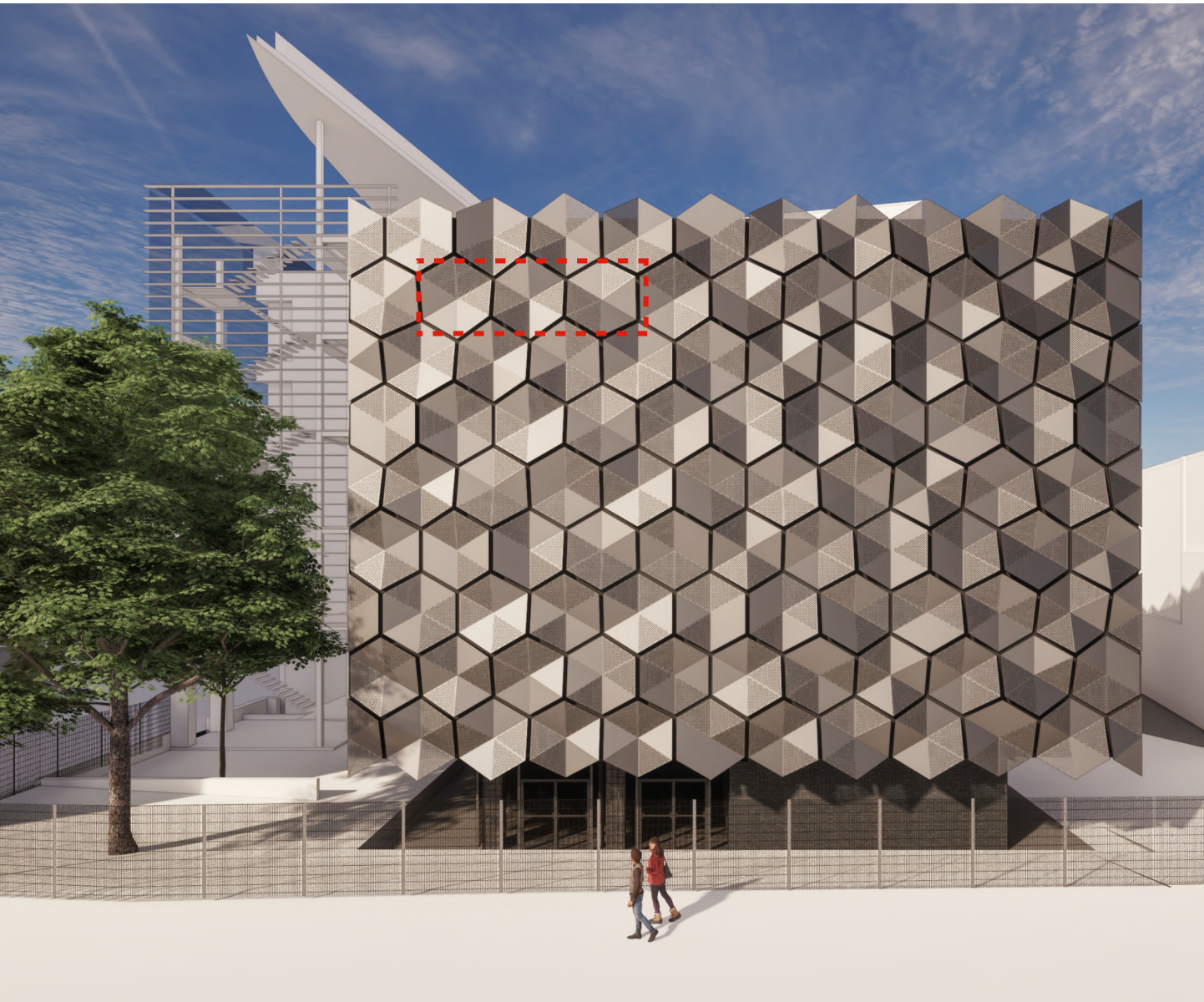
DOORS

The external doors are heavy duty steel
security doors. Polyester powder coated
finish.



3.0 | Design

3.4 | Appearance



Signage

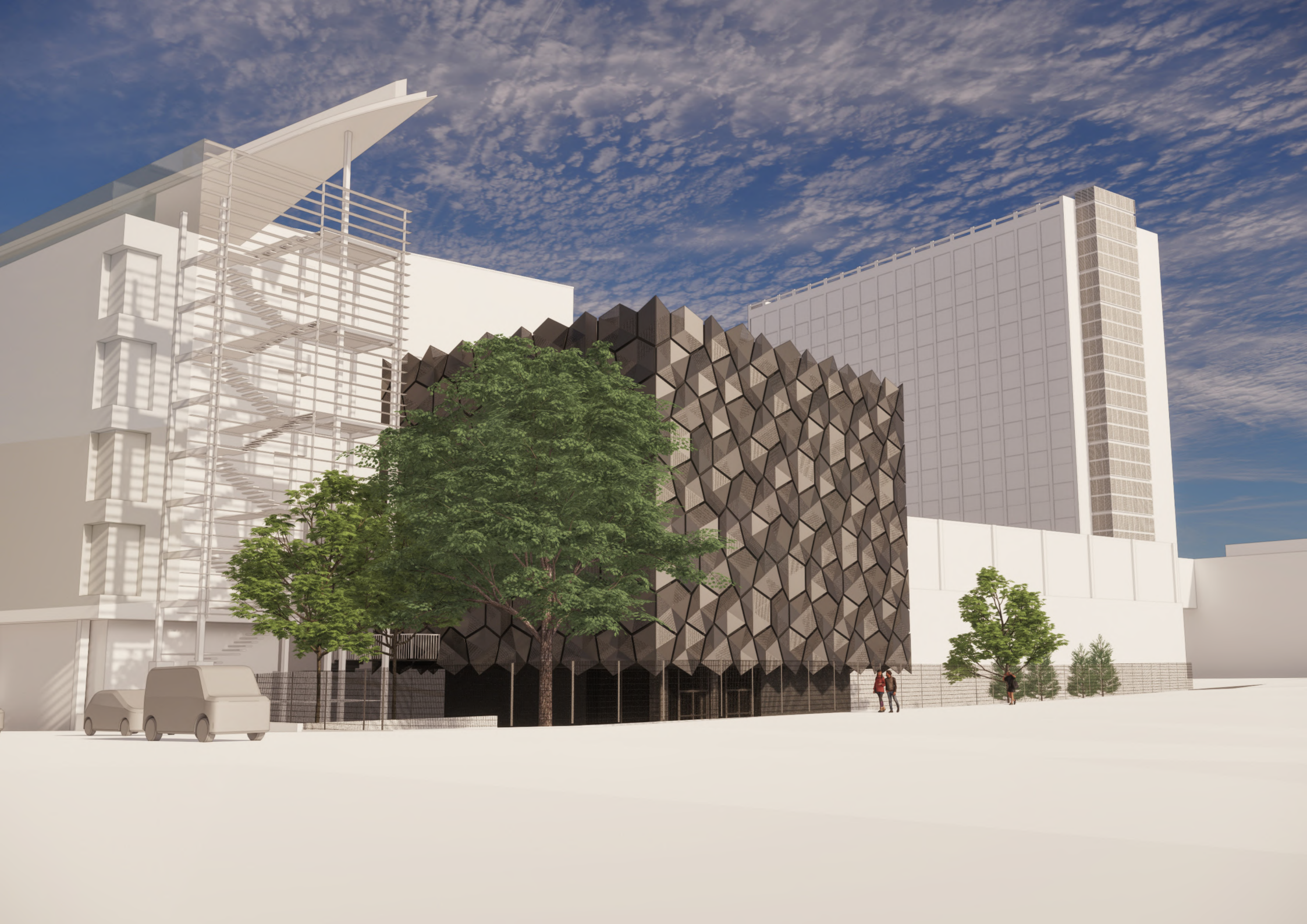
The proposed zone for building signage and branding preferred by the University is indicated on the adjacent elevation (red outline)

The signage format, including font and panel colours, is to adhere to a prescriptive arrangement set out in established University branding rules. The detail, including materiality, back lighting and fixing principles are to be established.

Lighting

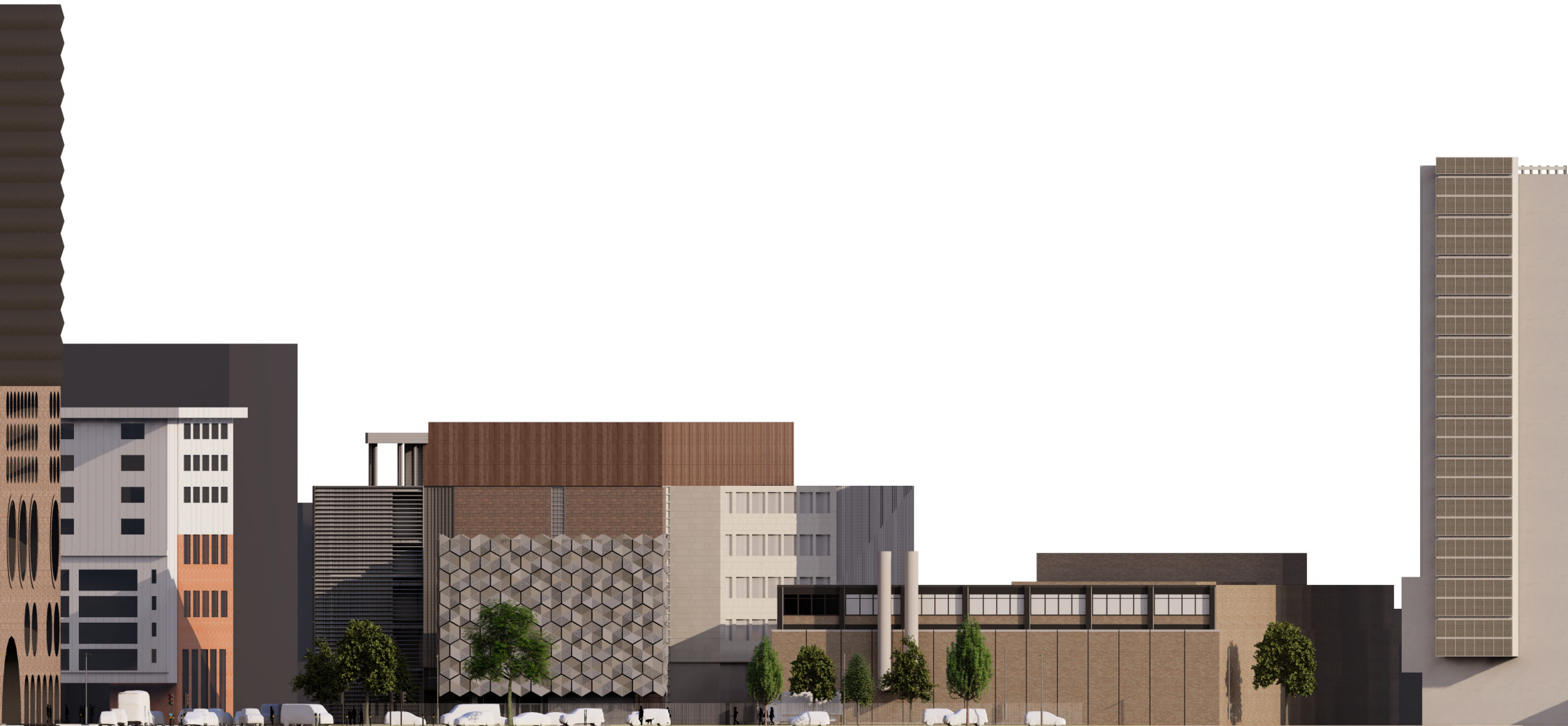
Options for lighting behind the shroud were reviewed at early design Stages, however the cost for the LED fixtures and controls was cost prohibitive and impacted upon the intended use of the gap behind the shroud to channel air vertically to the air source heat pumps on the roof.

It is currently proposed to site illumination within the landscape to light the faceted panels and bring further interest to the elevations, particularly at night.



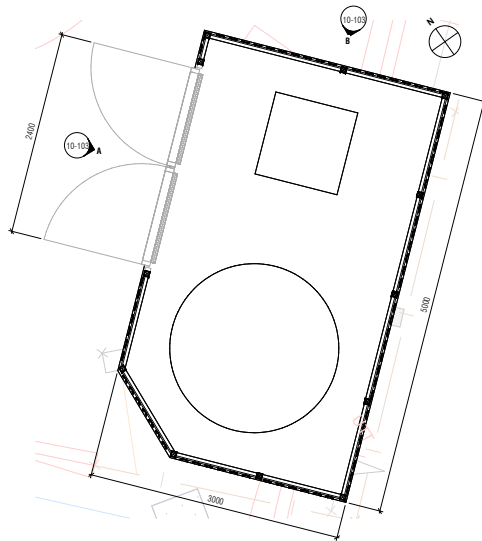
3.0 | Design

3.4 | Appearance and Context

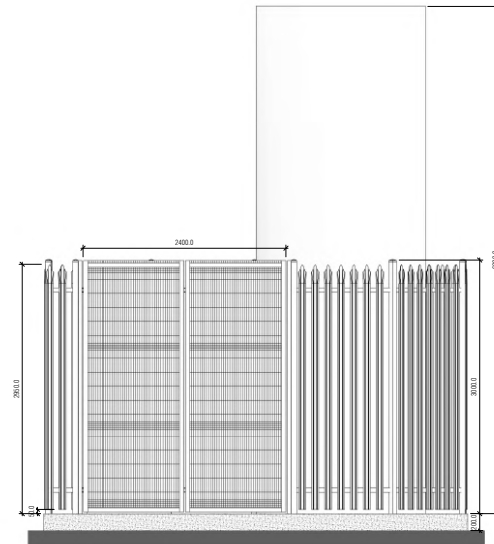


3.0 | Design

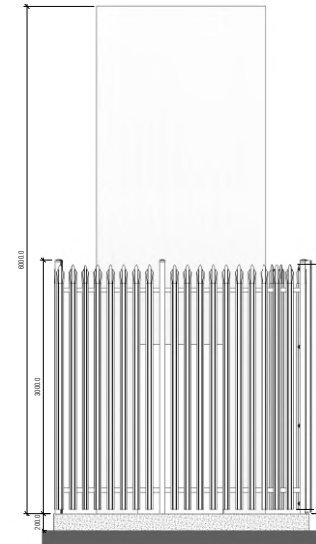
3.4 | Appearance - Temporary gas storage



1 General Arrangement - NMR
1 : 25



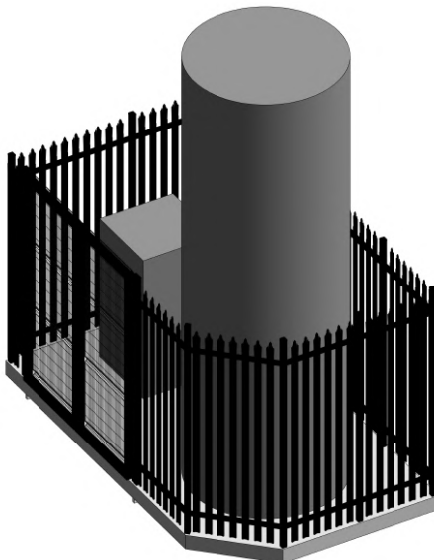
A NMR - Elevation A
1 : 25



B NMR - Elevation B
1 : 25

NMR Axonometric

2



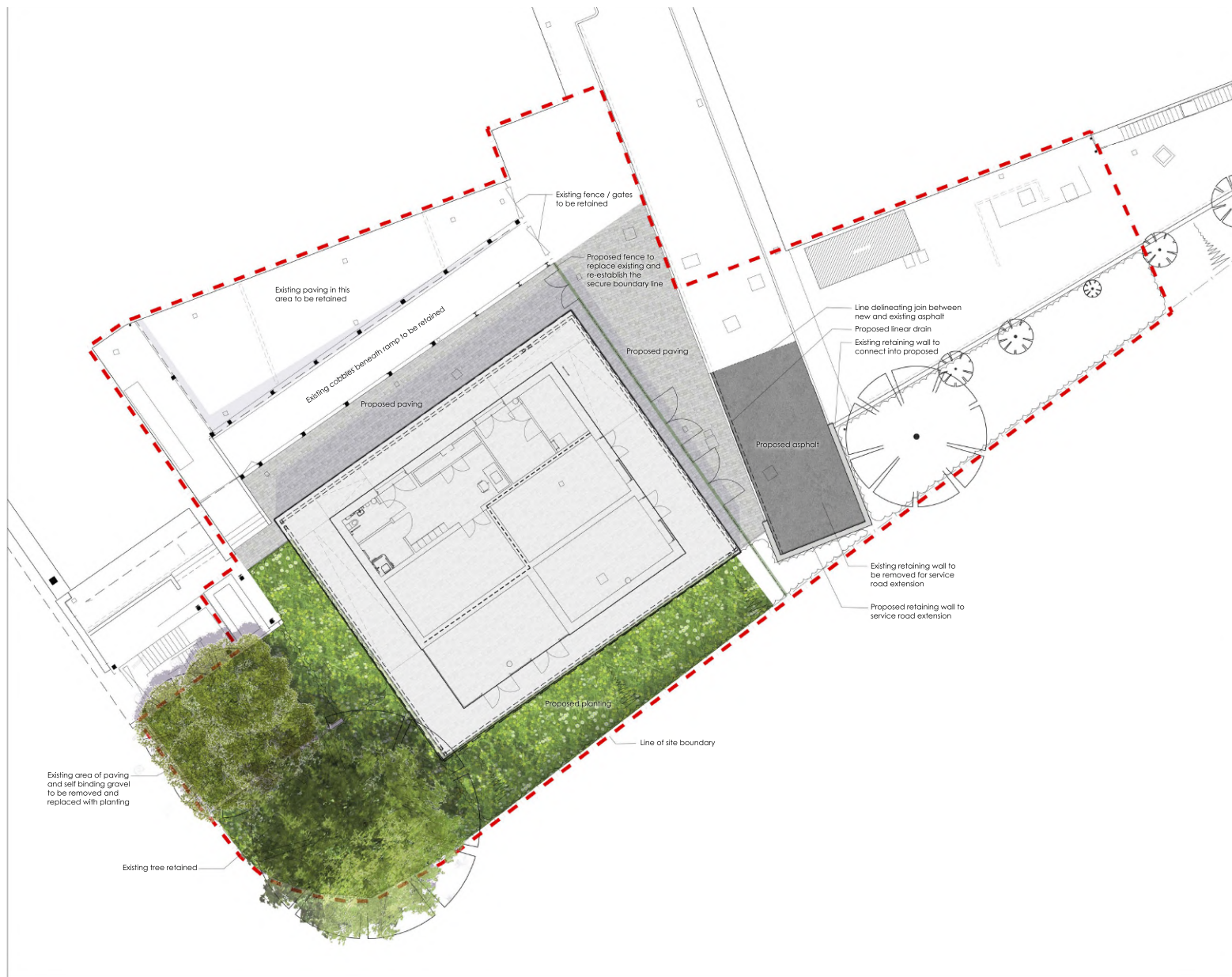
Temporary gas storage

- The existing gas storage is housed on the site where it is intended to position the proposed Energy Centre
- The gas is utilised for processes within the adjacent John Garside building. This provision must be maintained.
- The gas storage is therefore to be relocated to a temporary home during the Energy Centre construction works.
- Planning have been consulted regarding the cladding and aesthetic possibilities for the relocated compound and the importance of this was considered low acknowledging its temporary nature.
- Fencing; 3.0m high Steel Palisade Fencing, mid grey, powder coated.

Refer to the temporary gas storage (NMR) drawings

3.0 | Design

3.5 | Landscape



Landscape

Key Landscape Design Items at this Stage

- Removal of several existing retaining walls including fence around existing gas store
- Removal of existing steps (full and partial)
- Removal of 8No existing trees and existing planting along site boundary
- Removal of 3No benches and self binding gravel adjacent to external stair core
- Regrading existing fire escape route involving lifting and relaying existing paving to new levels
- Regrading landscape around and beneath existing ramp following removal of retaining wall / gas store etc
- Installing low brick wall within footprint of existing external stair core to allow for split levels.
- Extending service yard road to allow for fully tracked 3 point turning
- New retaining wall adjacent to site perimeter for service road and proposed NMR gas storage
- Proposed perimeter paving to energy centre
- Proposed 2.4m high fence and 2No double gates to eastern facade of energy centre to maintain secure line
- New low planting to reggraded boundary of site
- New ornamental planting adjacent to external stair core

Refer to the Landscape architects submission

3.0 | Design

3.6 | Environmental and Sustainability

The opportunity for the Energy Centre project is created from the decommissioning of the North Campus district services for the redevelopment of the land parcel. The decommissioning included district Steam Heating, Domestic Water, HV Electrical Distribution and Natural Gas where they had originated in the 1950's and their economic life has expired. This affords the opportunity to modernise the services to the retained buildings. It will occur alongside the standard and regular replacement of building services which is required in any event.

Why change from fossil fuels to heat pumps?

Heat pumps are an energy efficient, low carbon way to heat buildings. Heat pumps are now commercially available and compatible for almost all types of building and heat networks and could generate notable energy cost savings.

What is an air source heat pump?

An air source heat pump (sometimes referred to as an air-to-water heat pump) transfers heat from the outside air to water – it uses an electrically powered refrigerant system to raise the temperature – the water is then used to substitute traditional heating to move the heat into your building.

It uses electricity to do this, but the ratio of heat energy it supplies is greater than the electrical energy needed to power the system.

This makes heat pumps a more environmentally sustainable option to heat your building than a traditional gas or oil boiler, as it produces far fewer carbon emissions than traditional heating systems.

How big is our system?

Our system to replace the fossil fuels in George Begg and John Garside building is initially 1.5MW or the equivalent of the heating capacity of 250 domestic properties, this system is expandable at source to 3.0MW the equivalent to the heating capacity of 500 domestic properties.

This provides the following benefits:

- The carbon footprint of the retained buildings will be substantially reduced.
- Additional disruption caused by the conversion of the retained buildings to Low Carbon Technologies will be avoided.
- The new infrastructure will be designed to meet the requirements of Low Carbon Technologies.
- The infrastructure design is expandable to more properties.
- The heat network design will be capable of recovering waste energy from cooling plant.
- The heat network design will flexibly accommodate progressive modernisation of existing plant and equipment.
- As new plant is integrated the efficiency of the network will be enhanced.
- The network uses water as a heat transfer medium, so is environmentally sustainable.

External Environmental factors

Two key factors are considered; noise and micro climate temperatures.

Noise:

The external air source heat pumps on the energy centre are inherently noisy, careful consideration has been given to their selection and the energy centre design location to manage noise nuisance to within acceptable parameters against the location chosen.

An acoustic survey has been produced by an acoustic consultant and will be submitted to accompany the full Planning application.

The energy centre building envelope has been designed to shroud direct noise to adjacent buildings and the separation distance to residential properties has been optimised, where the location chosen on the site is the furthest possible from a residential property. Permitted development rights would usually require sound levels to not exceed 42 decibels when measured at a residential window. However, the location selected adjacent to Mancunian way has background noise

levels that exceed the usual regulatory requirements, this makes the noise level from the plant less consequential.

The ASHP selected are low noise variants for commercial plant, however the noise levels are still being further reduced through the design of the plant compound and the fitting of supplementary noise suppressing equipment such as acoustic compressor jackets and acoustic pods to the fan assemblies.

Micro Climate:

The location on an energy dense heat pump system can produce a localised micro climate or heat island. The energy centre design and geometry has been carefully considered to aid the dispersal of air and to avoid air flow 'daisy chaining' between heat pumps. Where air exiting the heat pump is entrained in the inlet air this causes a loss of efficiency and can ultimately cause a reduction in capacity of the heat pumps unit. This causes a secondary issue, that if the micro climate becomes too hot or cold can cause the units to shut down. The units selected for the Energy Centre have been selected with 'low ambient kits' which will permit operation down to -20.0°C. This will allow the proposed system to deliver full design capacity with Met Office temperatures below -5.0°C with a 10.0°C -15.0°C operational margin should any unusual weather or prevailing wind conditions cause an air pocket to be trapped in the proximity of the Energy Centre.

4.0 | Access

4.1 | Vehicular Access

Vehicular Access

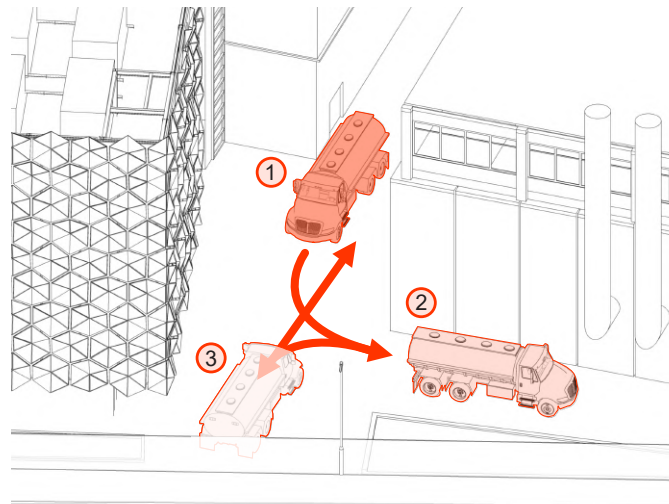
Vehicular access to the site is via Drover Lane, which in turn is accessed from Sackville Street to the East and Princess Street to the West.

Delivery and Emergency Access

Improvement works to Drover Lane are proposed, including a small extension to the southern end of the road within the University site.

A vehicular tracking exercise have been carried out to assess the feasibility of large vehicles getting to the Energy Centre at the end of Drover Lane, and performing a 3-point turn to enable exiting from site forwards. See illustration below.

02



4.0 | Access

4.2 | Pedestrian Access

Pedestrian Access

The Energy Centre is wholly contained on University of Manchester estate. A security fence separates the building from any accessible areas. There is no public access. The only personnel expected to use the building and adjacent site are delivery operatives and University maintenance and servicing staff. Visits to the building will be sporadic and as-needed. There are no permanent staff located within this building.

Vertical access is achieved via an external steel stair to the west elevation and a safety ladder with hoop provision to the east.

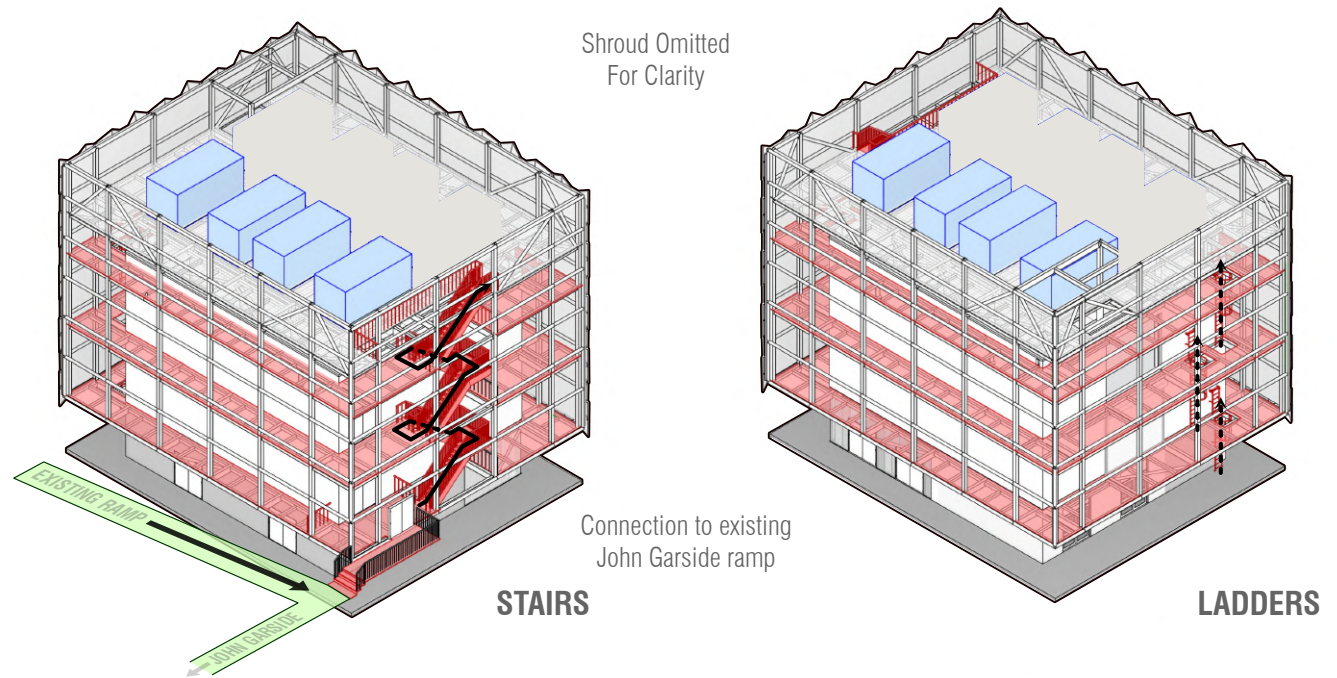
The stairs do not begin at ground floor due to proximity to the existing access platform/ramp adjacent to John Garside, but provide access to 1st, 2nd, roof and plant deck. By not having the stairs at ground level, the security demands of the building will be enhanced.

The escape stairs begin at ground floor and accesses 1st, 2nd floor and roof level.

Both means of access can be utilised for escape in the event of a fire or other emergency. The stairs are wider than regulation requires, this is in the interest of easing maintenance access when carrying portable but large or unwieldy equipment.

The stair arrangement and detail has been discussed with Building Control to ensure it addresses all compliance requirements. This includes the required provision of a cover for the stair to assist protecting building users and the stairs themselves from weather conditions.

It is proposed to connect the new building perimeter mesh walkway with the existing ramp arrangement abutting the John Garside building.



Inclusive Design

The building ground floor slab has two levels. The lower level has been established to address the CDM needs of installing large transformers. Electricity North West were consulted regarding the logistical as well as safety aspects of the installation. The upper level is higher than level noted in the FRA report as potential flood risk.

Gradients around the building vary from 1:12 to 1:40. Refer to Landscape architects information regarding external works levels and gradients of the adjacent site.

Acknowledging the nature of the building and its usage, there is no necessity to install a passenger lift.

4.0 | Access

4.3 | Maintenance Access

To address the functional needs of the new Energy Centre, acknowledging it is a large plant facility, maintenance access has been a core consideration during the design development.

A zone to the east elevation, served by vehicular access at the end of Drover Lane is proposed. This enables large and heavy items to be delivered to the bottom of a defined hoist zone. These items are then taken into ground floor or raised, utilising a lifting beam to upper areas as needed.

The design allows the floor to carry the weight of an `A` frame and other lifting equipment such subcontractors would use to move equipment.

Infrequent Maintenance

Large scale and consequential maintenance activities are only likely in the long term, suggested as every 15-25 years.

Works deemed to fall within this category include removal and replacement of complete pieces of equipment and entire installations.

Even though deemed a rare occurrence, allowance has been made due to its potential impact upon the building.

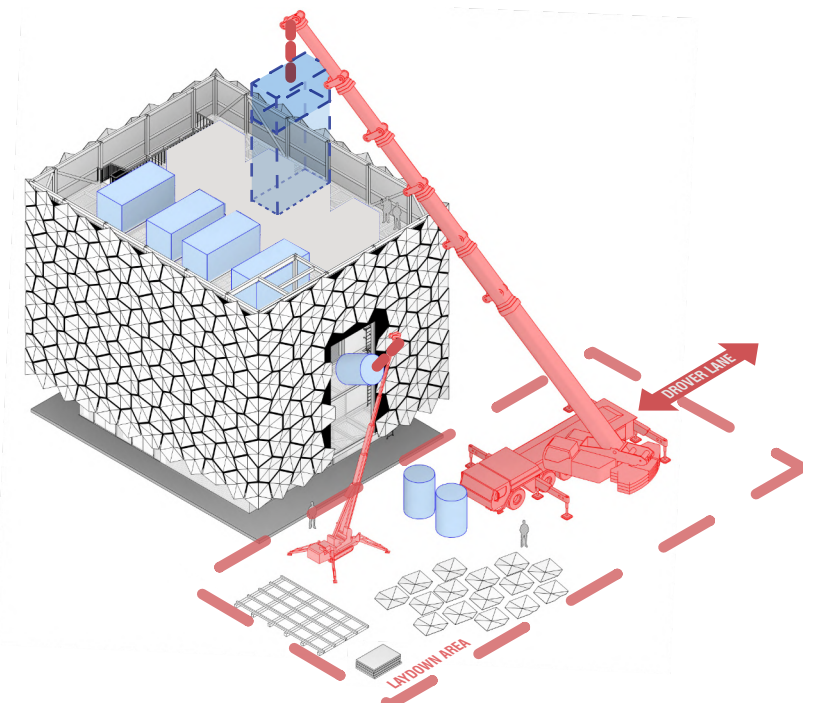
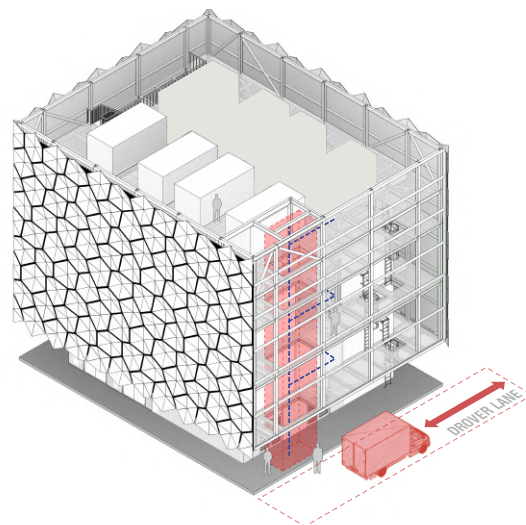
A zone to the east elevation, served by vehicular access at the end of Drover Lane is proposed to be constructed of a robust road build up, suitable to accommodate the weight of lifting vehicles.

With the use of cranes and MEWPs, parts of or even fully constructed plant installations can be maneuvered to the floor required or even onto the open plant deck area above the roof.

Within the panelled shroud facade, it is proposed to include a section which is removable as individual panels (circa 8nr), to allow access to the shuttered apertures through the envelope cladding behind. These

shroud panels are mechanically fixed to the supporting sub-frame and acknowledging the rare occurrence such a removal will be required it is considered a reasonable proposal.

There is area allotted for the future expansion of ASHPs to the roof, if required. 4 are used of the 8 defined in the current scheme.



5.0 | Supporting Information

THIS DOCUMENT IS TO BE READ IN CONJUNCTION WITH THE OTHER SUPPORTING INFORMATION FORMING THE PLANNING SUBMISSION. THE FOLLOWING DRAWINGS AND DOCUMENTS ARE SUBMITTED IN SUPPORT OF THIS APPLICATION.

Drawings:

MEC-WMA-XX-ZZ-DR-A-00-001_D2-P05 - Location Plan
MEC-WMA-XX-ZZ-DR-A-00-002_D2-P04 - Existing Site Plan
MEC-WMA-XX-ZZ-DR-A-00-003_D2-P04 - Proposed Site Plan
MEC-WMA-XX-XX-DR-A-00-013_D2-P02 - Temporary NMR Gas Storage Site Plan

MEC-WMA-XX-GF-DR-A-10-100_D2-P08 - General Arrangement Ground Floor Plan
MEC-WMA-XX-FF-DR-A-10-101_D2-P07 - General Arrangement First Floor Plan
MEC-WMA-XX-SF-DR-A-10-102_D2-P07 - General Arrangement Second Floor Plan
MEC-WMA-XX-RL-DR-A-10-110_D2-P07 - Roof General Arrangement Plan
MEC-WMA-XX-PD-DR-A-10-111_D2-P07 - Plant Deck General Arrangement Plan

MEC-WMA-XX-ZZ-DR-A-10-103_D2-P02 - Temporary Gas Storage Plan and Elevations

MEC-WMA-XX-ZZ-DR-A-20-100_D2-P07 - Proposed Elevation General Arrangement - North
MEC-WMA-XX-ZZ-DR-A-20-101_D2-P07 - Proposed Elevation General Arrangement - East
MEC-WMA-XX-ZZ-DR-A-20-102_D2-P07 - Proposed Elevation General Arrangement - South
MEC-WMA-XX-ZZ-DR-A-20-103_D2-P07 - Proposed Elevation General Arrangement - West

MEC-WMA-XX-ZZ-DR-A-20-110_D2-P07 - Proposed Sections General Arrangement- Sheet 1
MEC-WMA-XX-ZZ-DR-A-20-111_D2-P07 - Proposed Sections General Arrangement - Sheet 2
MEC-WMA-XX-ZZ-DR-A-20-112_D2-P06 - Proposed Sections General Arrangement - Sheet 3

MEC-WMA-XX-ZZ-DR-A-20-200_D2-P02 - Site Sections

Reports/Supporting Information:

Upland House
Spring Lane
Samlesbury
PR5 0UX

01772 877 455
north@wilsonmason.co.uk

12 Albemarle Way
Clerkenwell
London
EC1V 4JB

020 7637 1501
london@wilsonmason.co.uk

www.wilsonmason.co.uk

WILSON MASON
architecture and interior design