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URS REFURBISHMENT

UNIVERSITY OF READING

DESIGN & ACCESS STATEMENT

URS Reading Design & Access Statement

November 2024

Our ref: 435-ACG-W033-ZZ-RP-A-1906

REVISION SHEET

REPORT TITLE: DESIGN & ACCESS STATEMENT
REPORT NUMBER: 435-ACG-W033-ZZ-RP-A-1906

This report has been prepared for the sole benefit, use and information of **University of Reading** to accompany a planning application submitted to the local authority.

This report, together with supplementary reports accompanying it, relates to the present design and may be subject to changes as the project progresses.

REVISION	DATE	STATUS	PURPOSE	PREPARED BY	CHECKED BY
P1	01/11/2024	DRAFT Issue	For Senior Project Lead Review	JMG	RB/DG
P2	08/11/2024	DRAFT Issue	For Senior Project Lead Review	JMG	RB/DG
P3	20/11/2024	DRAFT Issue	For Senior Project Lead Review	JMG	RB/DG
P4	22/11/2024	FINAL DRAFT Issue	For Senior Project Lead Review	JMG	RB/DG
P5	29/11/2024	Formal Issue	For Planning	JMG	RB/DG

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01 INTRODUCTION

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EXECUTIVE SUMMARY

The University of Reading Estates Strategy places an emphasis on the re-purposing of the URS Building as an integral component of the WhiteKnights campus redevelopment initiative. With a Gross Internal Area of approximately 7500m², the URS Building constitutes a substantial structure, and the overarching strategy is focused on introducing numerous shared teaching spaces to accommodate the future anticipated growth in the university population.

Previously housing the School of Built Environment's (SBE) Construction Management & Estates department (CME), the URS Building occupants underwent relocation to a temporary facility in the Chancellor's Building. The intention of the full strategy is to also reintegrate the CME into the renovated building.

The existing structure exhibits notable deficiencies in environmental control, fabric efficiency, disabled access, and fire escape provisions. It is envisaged that the retrofitting process will significantly improve these shortcomings.

The URS Building received Grade II listed status in 2016 due to its commendable representation of early 1970s Structuralist architecture. Preserving its integrity and areas of significance while adapting it to play a vital role in the campus constitutes a key aspect of the overarching brief.

For this secondary planning application, the proposal is expanded into a full refurbishment of the building. It is a standalone application developing from the recent approval of the 'Phase 2' external works.

PROJECT TEAM

Client Adviser & Project Manager	University of Reading
Architect	Ayre Chamberlain Gaunt
Planning Consultant	BNP
Structural Engineer	Curtins
M&E Consultant	CPW
Heritage Consultant	Purcell
Fire Consultant	Hydrock
Cost Consultant	Edge



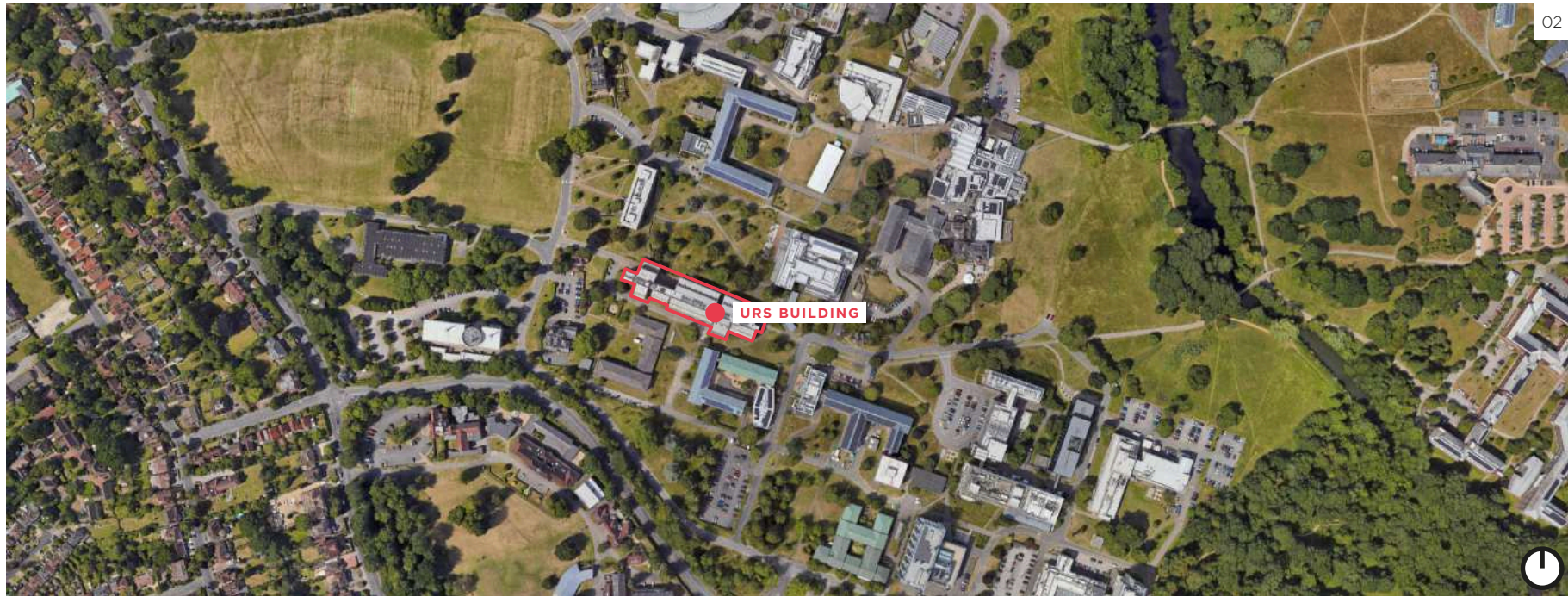
01 Exterior image of the southern facade of the URS Building.

SITE LOCATION

Situated at the heart of the University of Reading's Whiteknights campus, the Grade II listed site is positioned just outside the centre of Reading. Flanked by tree-lined residential streets and diverse student accommodations, the campus enjoys a well-connected locale.

The nearest train station, Early station, is approximately 1.4 miles away, while Reading station lies approximately 1.9 miles to the north. Regular trains from Reading station provide swift access to London Paddington in 23 minutes.

Embracing greenery, woodlands, and a lake, the Whiteknights campus prioritises pedestrian and cyclist use by limiting vehicular routes. A public right of way runs through the campus and passes beneath the URS Building overhang. Other notable Grade II listed structures on the campus include the Whiteknights House Annex and Blandford Lodge.



01 Aerial view showing site location within southern Reading (Google Earth 2023).

02 Aerial view showing site location within the University of Reading, Whiteknights campus (Google Earth 2023).

EXISTING BUILDING OVERVIEW

The URS Building's layout is anchored by a prominent circulation spine running along the East/West axis, featuring a substantial overhang to the north and expansive glazing to the south. The form is dictated by the function and size of each space, resulting in a dynamic interplay of solids and voids along the facades. Noteworthy elements include the distinctive roof-level water tower and a ground-level fish pond. HKPA, the original architects, intentionally designed the east facade to accommodate future extensions.

Accommodation is located on the first 5 levels (ground floor - fourth floor), with the addition of a plant room basement and a water tower on the fifth floor. The building is accessed by vehicles from the south on Fountain Street, while a public right of way passes beneath the overhang to the north.

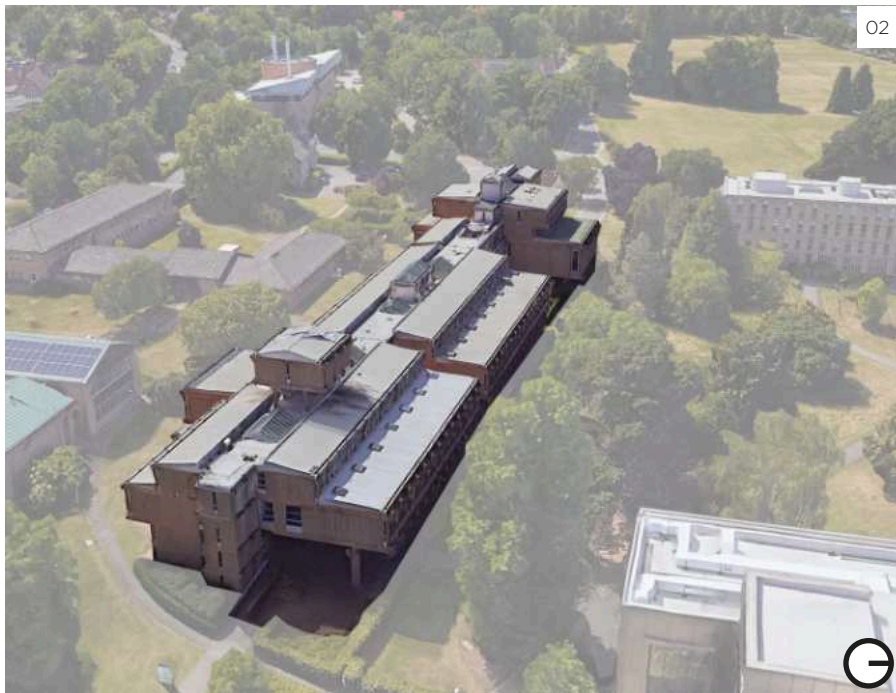
The overall architectural structure draws inspiration from both brutalism and traditional Japanese construction, contributing to its listing as a Grade II building.

For detailed information on the URS Building's Grade II listing, please consult the 'Planning & Heritage' section of the report or Purcell's 'Heritage Impact Assessment'.



01 Existing site aerial view - North facade (Google Earth 2023).

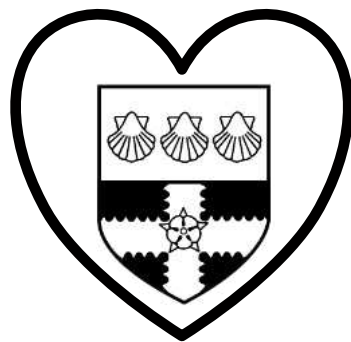
02 Existing site aerial view - East facade (Google Earth 2023).



03 Existing site aerial view - South facade (Google Earth 2023).

04 Existing site aerial view - West facade (Google Earth 2023).

BRIEF/KEY DRIVERS



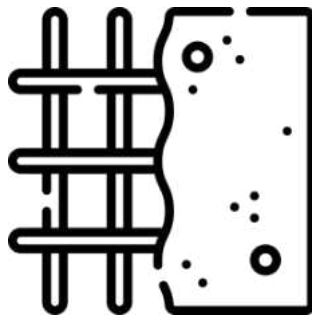
HEART OF WHITEKNIGHTS CAMPUS

The URS Building has significant presence among the landscape of the WhiteKnights campus, conceived as both the heart and focal point of the university grounds.



SUPPORT UOR'S NET ZERO PATHWAY

Although the URS Building is unlikely to achieve Net Zero, in its current form it is a serious impediment to the University's Net Zero goals. It is important to enhance its environmental efficiency to the fullest extent permitted by its design and listing constraints, whilst mindful of capital expenditure and budget.



STRUCTURAL CONDITION

The existing URS concrete structure requires assessment, remedial works and a future maintenance plan. The aim is to address exterior repairs in this planning application.



ENVIRONMENTAL IMPROVEMENTS

Improvements to the building's envelope are required to create an efficient and useable building. Improving the internal environment and thermal comfort will give the building a secure use and future.



HERITAGE

URS has a Grade II listed status, which has heavily influenced the design discussions and decisions for the external refurbishment works.



ENHANCE STUDENT & TEACHING EXPERIENCE

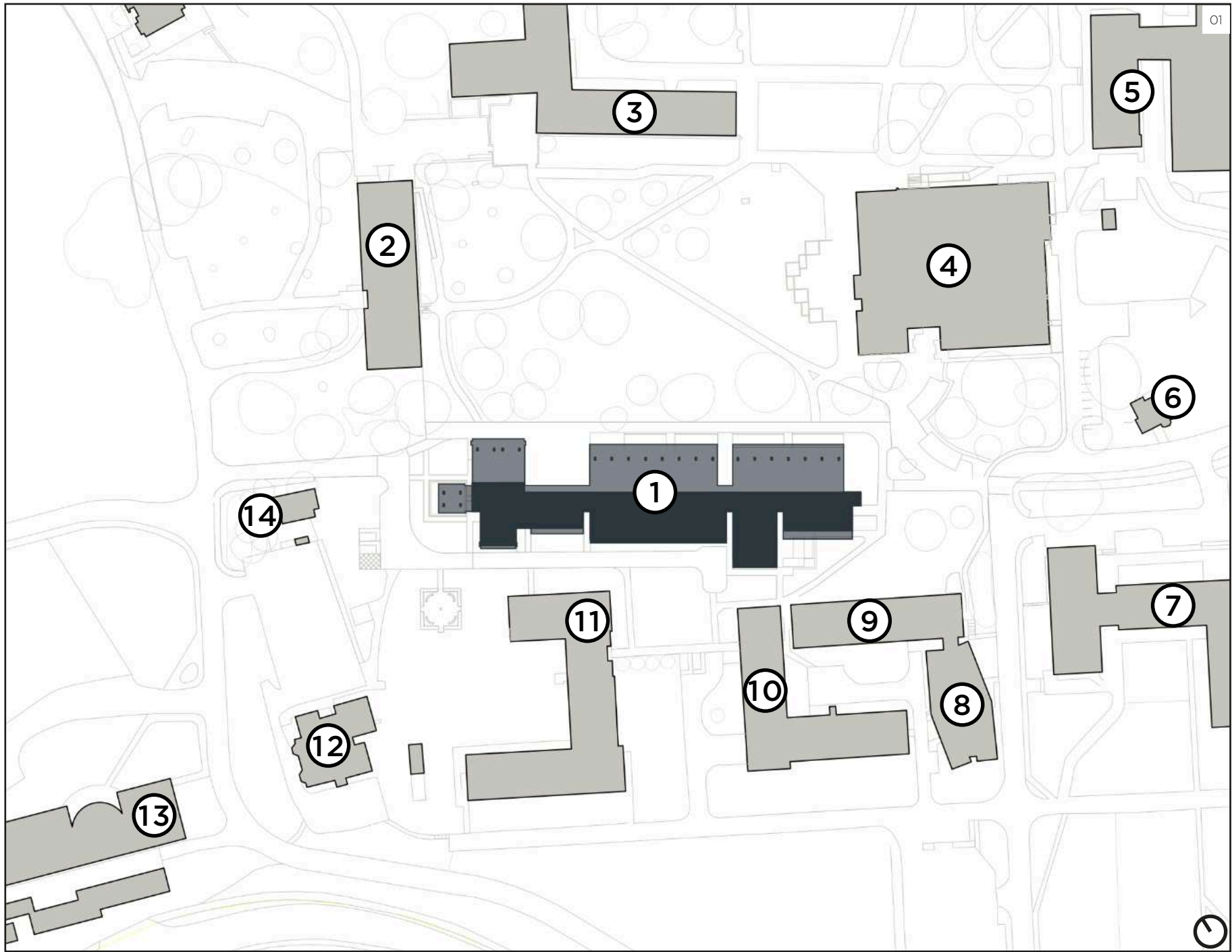
The University of Reading has placed emphasis on enriching the overall student and teaching experience of URS.

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SITE & CONTEXT

- KEY:**
- 1. URS BUILDING
 - 2. WHITEKNIGHTS HOUSE
 - 3. EDITH MORLEY
 - 4. LIBRARY
 - 5. THE CEDARS
 - 6. PARK HOUSE LODGE
 - 7. JJ THOMSON
 - 8. ARCHAEOLOGY
 - 9. THE ALLEN LABORATORY
 - 10. WAGER
 - 11. MILLER
 - 12. BLANDFORD LODGE
 - 13. RUSSELL
 - 14. ARCHWAY LODGE



01 Annotated map showing the surrounding university campus buildings (nts).

SITE CONTEXT PHOTOGRAPHS



- 01 Western facade and fish pond.
- 02 Southern facade adjacent to The Allen Laboratory and Wager.
- 03 View from the north-east into green parkland, north of the building.

- 04 The University Library, north-east of the URS Building.
- 05 Whiteknights House, north-west of the URS Building.
- 06 Whiteknights House and the Edith Morley building.

EXISTING EXTERNAL CONDITION



- 01 Fishpond.
- 02 External structural concrete beam condition.
- 03 Fault/damage in existing concrete beams.

- 04 North-west first floor overhang.
- 05 Public right of way running beneath northern overhang.
- 06 Patched repairs of concrete pre-cast panels.

EXISTING INTERNAL CONDITION



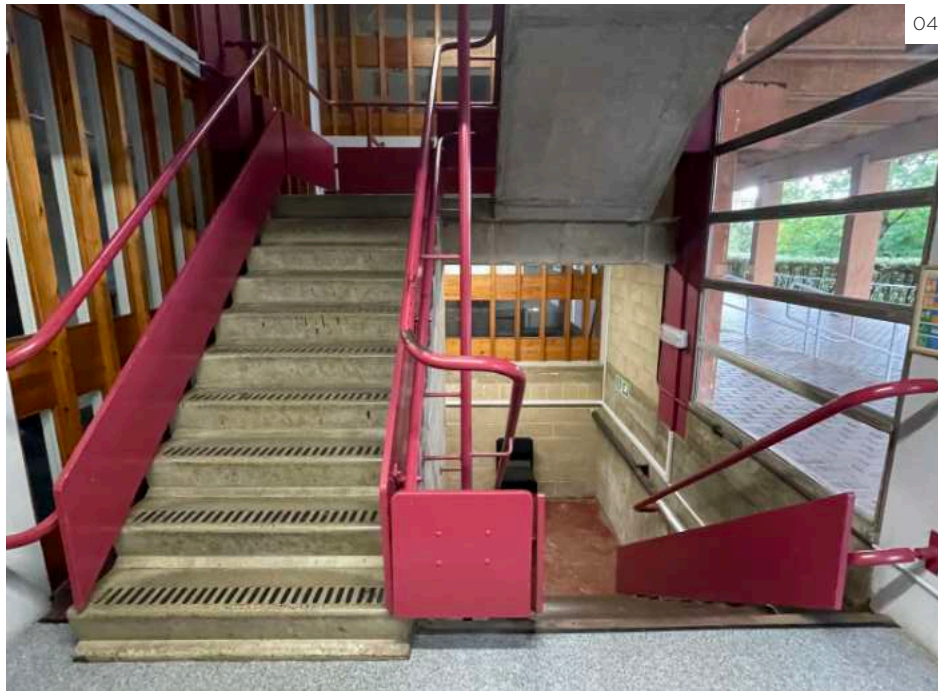
01



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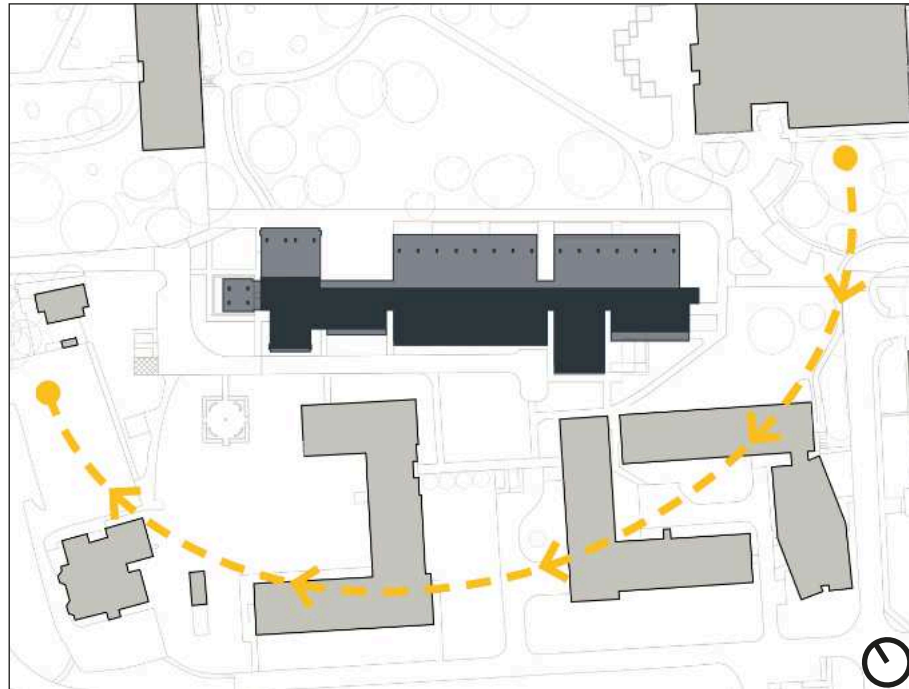


06

- 01 Ground floor double height study space.
- 02 Existing lecture theatre.
- 03 Fourth floor board room.

- 04 Existing staircase to basement and upper levels.
- 05 Internal glazed voids.
- 06 Internal garden courtyard.

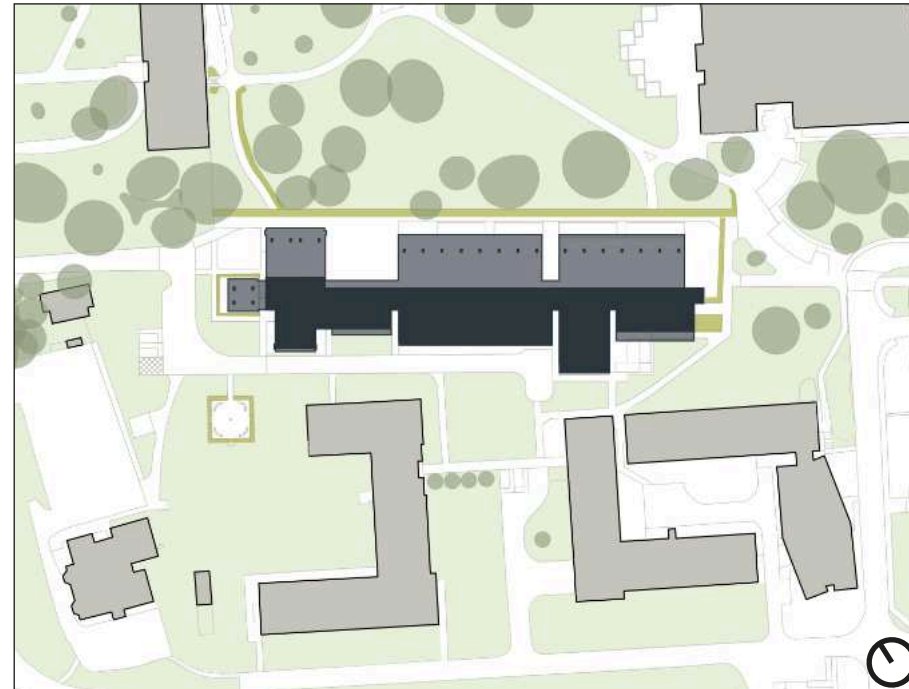
SITE ANALYSIS



SUN PATH & DAYLIGHTING

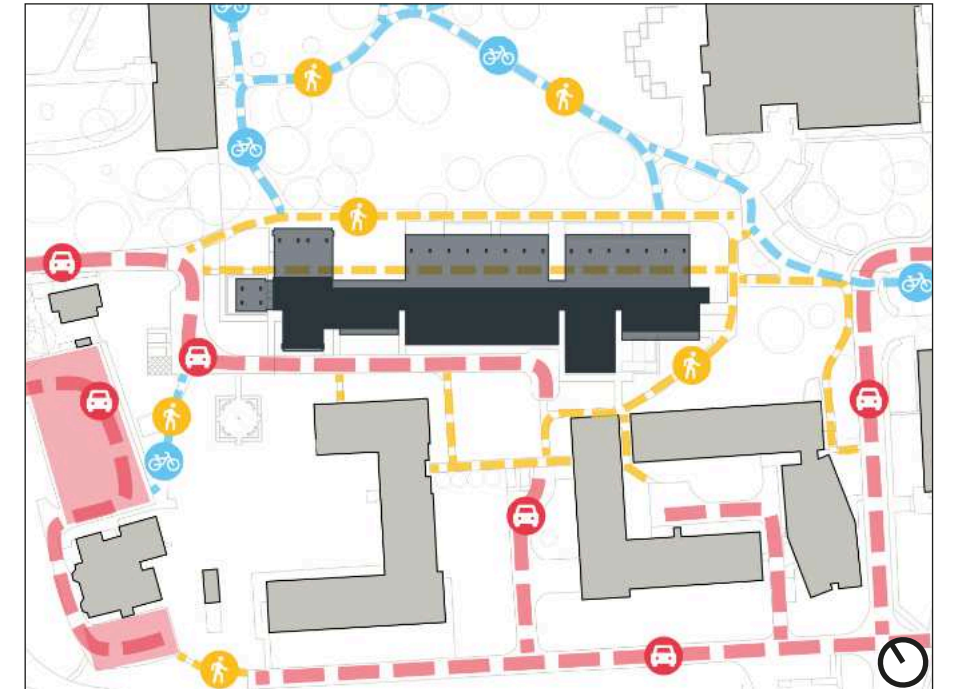
The building aligns in a north/south orientation, with substantial glazing on both of these facades. Interestingly, the larger overhangs and, consequently, enhanced solar shading are positioned on the northern elevation.

Although the current arrangement poses environmental challenges within the building, a north/south configuration is typically favourable when intentionally designed to optimise such orientation.



GREEN AREAS & VEGETATION

The building's orientation is evidently designed to frame and overlook the established landscape of the Whiteknights campus. Serving as the southern boundary to a substantial green space, the structure was initially configured with a notch in the northern elevation to accommodate a large existing tree, which, regrettably, has since been lost.



PEDESTRIAN, CYCLE & VEHICULAR ROUTES

A public right of way runs along the length of the building beneath the northern undercroft. The main pedestrian access route spans across the green space to the north, with primary pedestrian connectivity from the Library to the east and the Whiteknights House to the west.

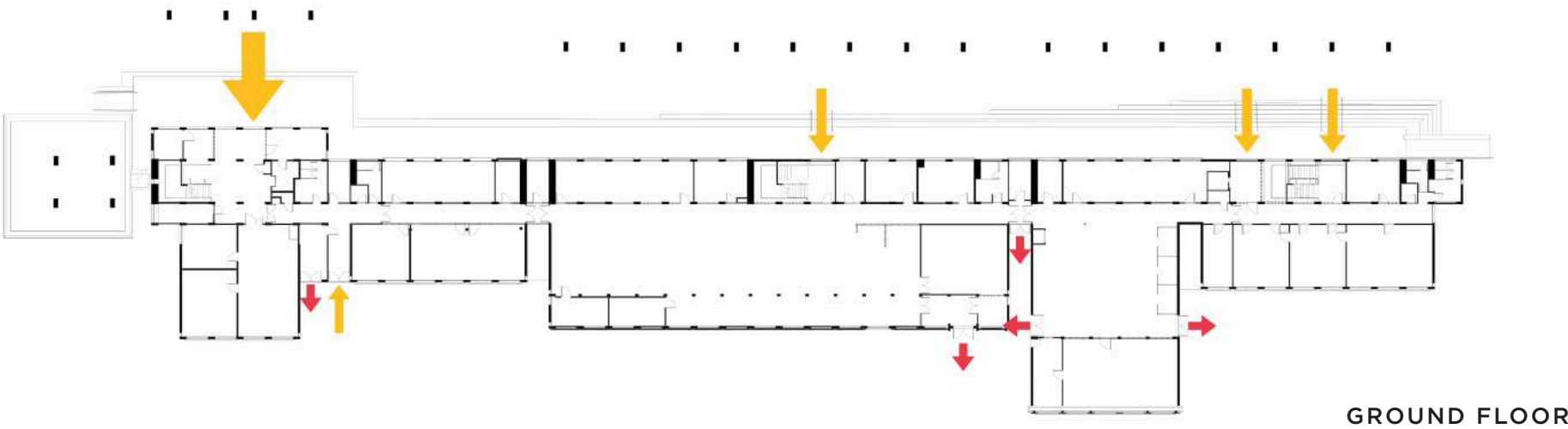
Vehicular routes pass to the south of the building, there is no defined parking or delivery area.

EXISTING BUILDING STRATEGIES

ENTRANCES AND EXITS

The primary entrance is located beneath the under-croft, to the west. There are also a number of minor access points and fire escapes to the north and south elevations.

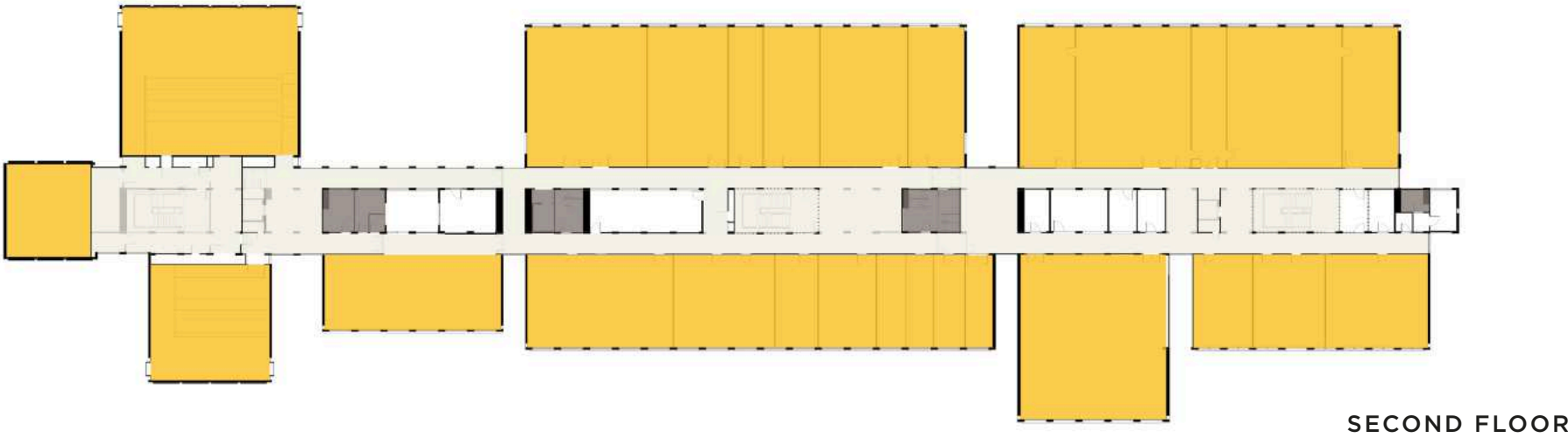
- ENTRANCES
- EXITS



BUILDING LAYOUT

The building was designed as 'vertebrae architecture' with a long circulation spine giving access to the accommodation areas. The functions of these volumes are articulated by size and form.

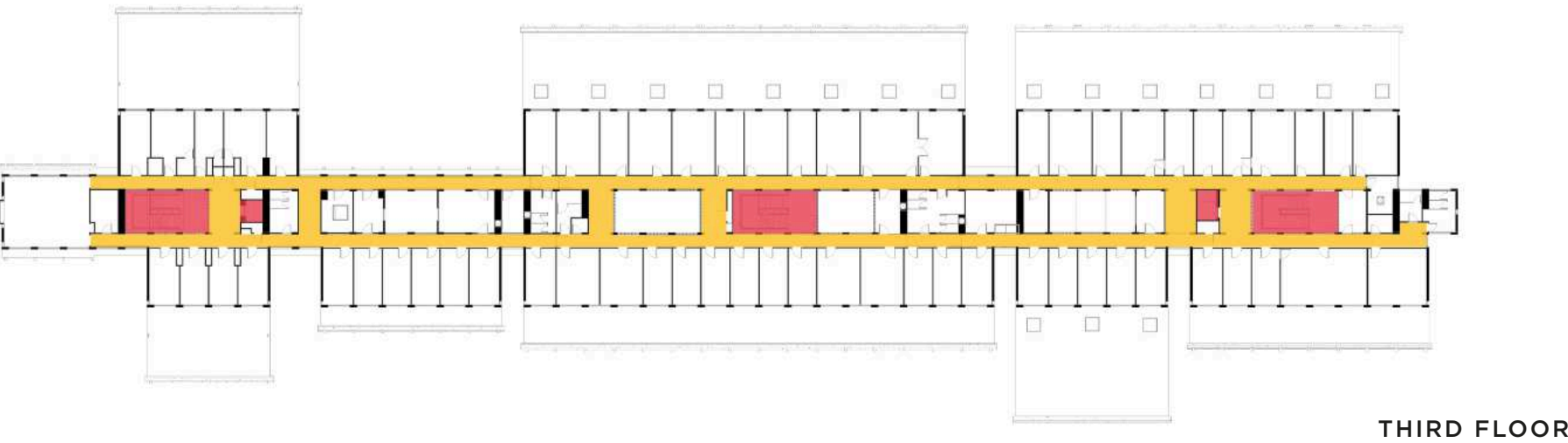
- ACCOMMODATION
- CIRCULATION
- WCs



CIRCULATION & STAIRS

The circulation spine is punctuated with stair cores, lift shafts and on the upper levels by light wells which drop light into the central spine. Across most levels, the circulation is divided on either side of these vertical elements.

- CIRCULATION
- STAIRS/LIFTS



03

PLANNING & HERITAGE CONTEXT

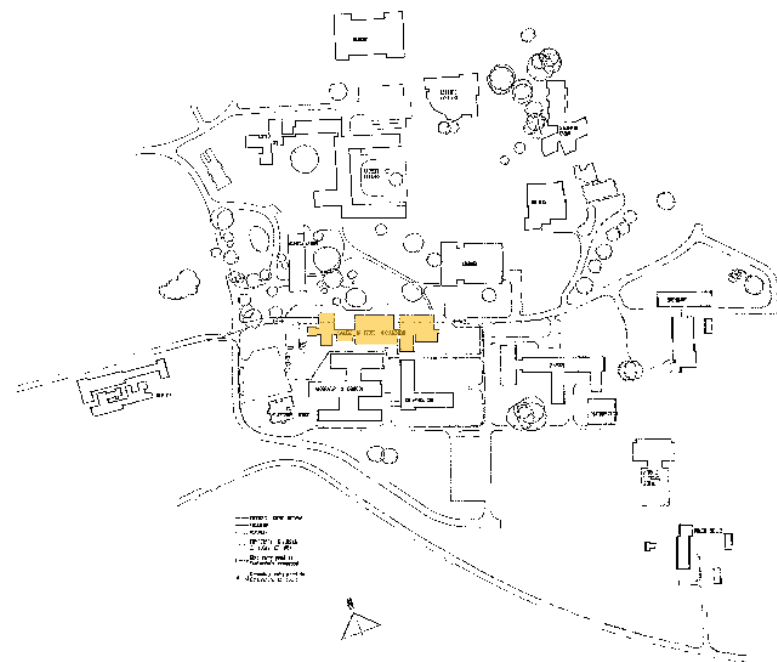
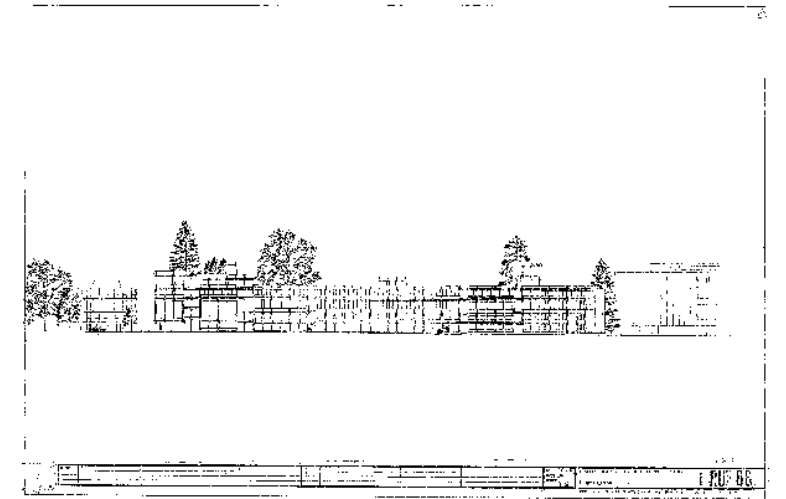
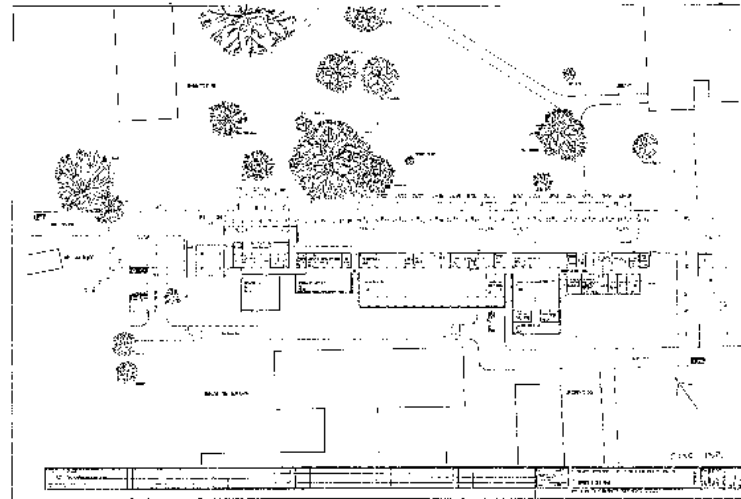
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HISTORIC OVERVIEW

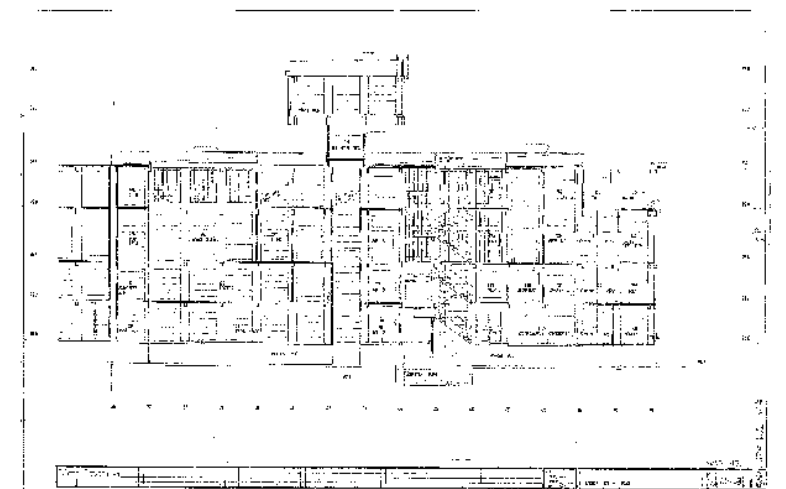
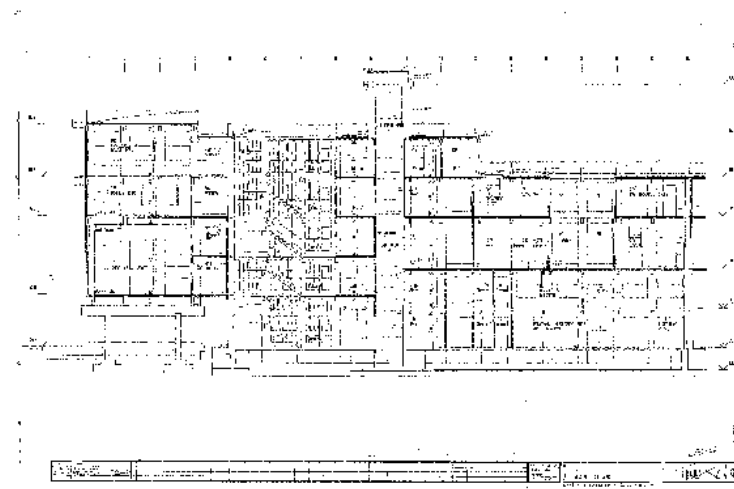
The URS Building was completed in 1972 by Howell, Killick, Partridge and Amis (HKPA), originally for the Faculty of Urban and Regional Studies (including the College of Estate Management, CEM).

For detailed information on the history and heritage of the Whiteknights Campus and URS Building, please refer to Purcell's 'Heritage Impact Assessment' in the planning pack.

02



01



- 01 Historic map of the University of Reading Whiteknights campus, with the URS building highlighted in yellow.
- 02 Historic drawings of the URS building.

LOCAL LISTED BUILDINGS

LISTED BUILDINGS ON THE WHITEKNIGHTS CAMPUS (& SURROUNDING AREA)

1. WHITEKNIGHTS HOUSE ANNEX

Grade: II

Date first listed: 14/12/1978

2. URS BUILDING

Grade: II

Date first listed: 13/07/2016

3. BLANDFORD LODGE

Grade: II

Date first listed: 14/12/1978

4. SCHOOL HOUSE AND ATTACHED LABORATORIES (AT LEIGHTON PARK SCHOOL)

Grade: II

Date first listed: 14/12/1978



01 Annotated site plan with listed buildings highlighted in yellow (nts).

HERITAGE LISTING

REASONS FOR DESIGNATION

As per the Historic England website, the reasons for the Grade II designation are as follows:

Architectural Interest

- “Expressive use of structure to enclose space, referencing Japanese construction”.
- “Playful exaggeration of the post and lintel joints”.

Planning Interest

- “The practical, cost efficient, central corridor plan”.
- The central corridor “innovatively re-imagines ways to bring natural light into the core of the building”.
- “Dynamic cross-section due to the linear plan”.

Architects

- “The building comes towards the end of HKPA’s impressive sequence of educational buildings”.
- The URS building “expresses important elements of the practice’s architectural philosophy while being an idiosyncratic and creative response to its brief”.

KEY ELEMENTS OF SIGNIFICANCE

(As stated in Purcell’s ‘Heritage Impact Assessment’)

- “Designed by one of the leading practices of the Post-War period, HKPA”.
- “Key building in the historic campus of Reading University”.
- “Impressive structural qualities from different lines of architectural enquiry, including Brutalism and Japanese methods of construction”.
- “Re-imagining of the historic carriageway, ornamental pond and use of colour as a metaphor for the surrounding landscape”.
- “Contextual and rare use of pigmented concrete in two tones”.
- “Expression of ‘vertebrate architecture’ as a means of spatial planning and educational engineering in building design”.
- “Consistent use of materials on the interiors, including timber and steel, which gave a coherence and unity across the building”.

“Pursuant to s.1 (5A) of the Planning (Listed Buildings and Conservation Areas) Act 1990 (‘the Act’) it is declared that internal, non-structural, party walls between adjacent rooms are not of special architectural or historic interest”

- Historic England

PLANNING & HERITAGE SUMMARY

PLANNING OVERVIEW

The planning application seeks full planning permission and listed building consent for the full refurbishment of the URS Building.

The enabling and strip-out works are underway (Phase 1 of the building’s refurbishment). The internal and external works proposed under this application represent the next important step in bringing URS back into use, restoring the heart of the University of Reading Whiteknights Campus.

The University and it’s consultant team have engaged with both Wokingham Borough Council and the Twentieth Century Society (“C20”) prior to the submission of this planning application. For further information, including the pre-application advice received from both parties, **please refer to ‘BNP Paribas’ Planning Statement’ in the planning pack.**

HERITAGE OVERVIEW

The full planning application has been, individually and collectively, conservation-led. The ‘Heritage Impact Assessment’ states that “the combined impact of the scheme is at the lesser end of ‘less than substantial harm’ to the listed building. Weighed with the public benefit of re-use for academic purposes and with the environmental and fabric repairs proposed, this package of works is therefore acceptable and proportionate to the significance of the URS, its setting and the surrounding heritage context”.

A significant amount of expertise in the field of conservation, surveying and historic research has informed the URS refurbishment proposals, focused on making the building fit for purpose and cared for. The various elements are evaluated in the ‘Heritage Impact Assessment’ and have a variety of impacts individually, but collectively represent a net benefit to the heritage asset.

For more information, please refer to Purcell’s ‘Heritage Impact Assessment’ in the planning pack.



01 Historic image of URS taken from the November 1973 issue of the Architectural Review magazine.

DEMOLITION STRATEGY

OVERVIEW

To successfully achieve project timeline and procurement, the URS building has adopted a three phase strategy to help streamline the process. The three phases of demolition are listed below:

- Phase 1 - Enabling works = strip out, asbestos removal, demolition of internal partition walls.
- Phase 2 - External fabric work = facade concrete repairs, roof replacement, and full external window, door and rooflight replacement and water tower repairs.
- Phase 3 - Internal fit out and refurbishment including full mechanical and electrical services upgrade, and external stairs.

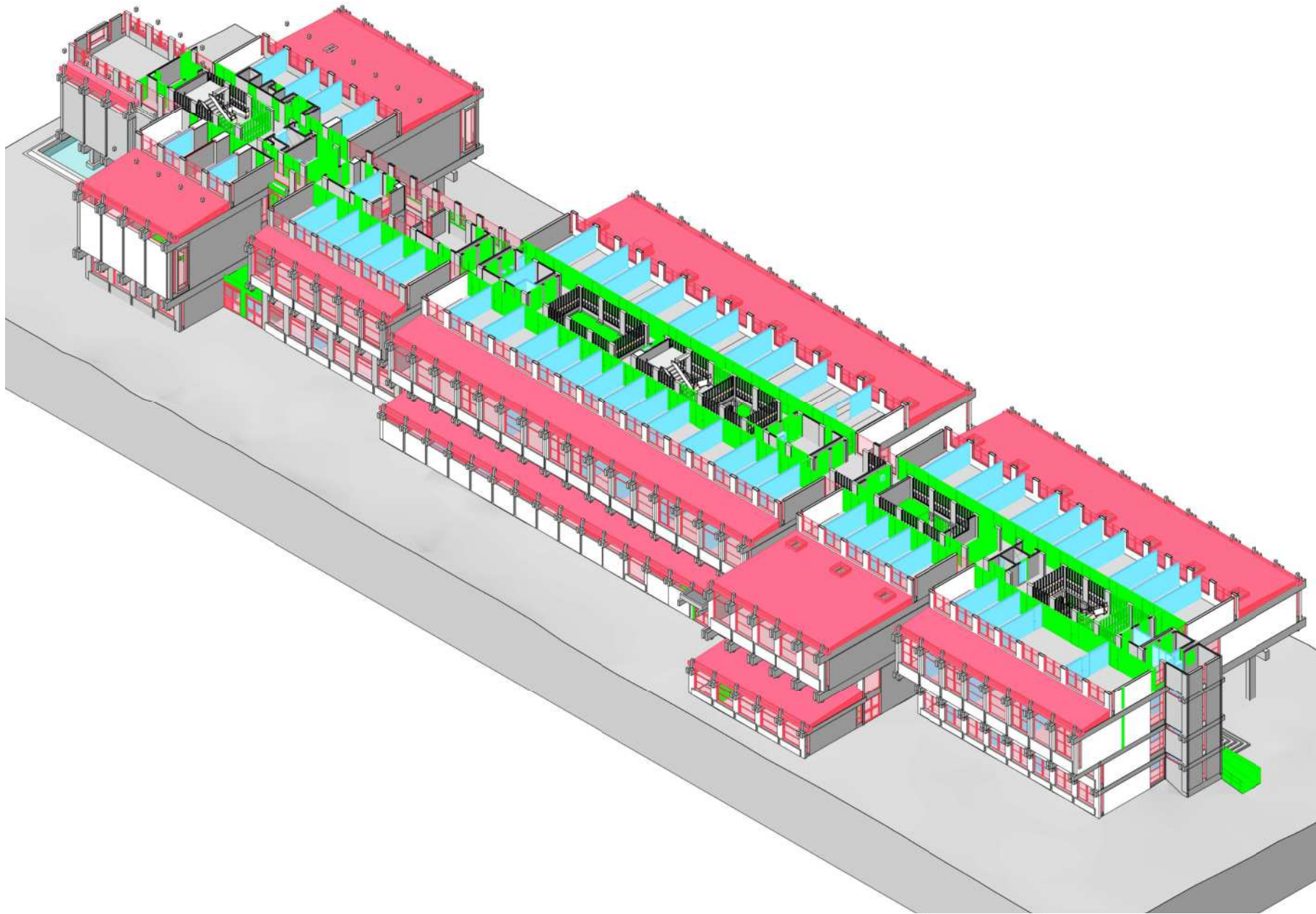
Phase 1 works are currently underway, Phase 2 has recently obtained planning permission/listed building consent and this planning application represents Phase 3 of the building strategy.

KEY:

PHASE 1

PHASE 2

PHASE 3



01 Annotated 03 level plan, showing the different demolition phases.

04

PRE-APPLICATION FEEDBACK

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PRE-APPLICATION FEEDBACK & RESPONSE

PAVING

PRE-APPLICATION FEEDBACK:

“Does the edging need to be black? A more subtle colour would be preferable”.

RESPONSE:

We propose to upgrade the step nosing, because the existing nosings are slippery (especially when wet). The originally installed paving tiles have no contrast at the step edge, which has lead to a poorly applied yellow paint to help identify the edge. Our proposal replaces the edge tile with a purpose made step tread, which is grooved for grip, and contrasts with the quarry tile for visibility.

BIN/CYCLE STORE

PRE-APPLICATION FEEDBACK:

“Concern that its proposed location would adversely affect the setting of the building. Would prefer a different and less prominent location”.

RESPONSE:

There are no alternative free areas within close proximity to the site for location of the bin and bike stores. Purcell’s ‘Heritage Impact Assessment’ concludes that the stores will have limited impact on the setting of the URS building.

PRE-APPLICATION FEEDBACK:

“Is there a reason for why more waste storage is required and why it cannot remain in its current location?”.

RESPONSE:

BREEAM requires a dedicated bin store area. There is no formal waste storage area currently and bins are regularly loose on the turning head to the south of the building.

NEW STAIR CORES (SOUTH)

PRE-APPLICATION FEEDBACK:

“In this location, Officer’s preference would be option 2 (not timber slat or curved design) as the shape and banding responds to the form found on the main building”.

RESPONSE:

Please see pages 49 - 56 for justification of our stair proposal.

PRE-APPLICATION FEEDBACK:

“Concern about how this core would relate to oriel window – would like to see the stair core pushed back away from the window (as could be achieved on the timber slat/ curved design). Similarly a concern with respect to the upper floor windows to the other side of the intend structure”.

RESPONSE:

The stair is pushed as far into the recess as possible. Restrictions, such as the size of the lift shaft, its relationship to the existing foundations below, and the minimum stair size to aid fire escape capacity all limit how far it can be reduced. The curved stair form was introduced to give more breathing space from the existing Oriel window.

PRE-APPLICATION FEEDBACK:

“Top level of the stair and lift core extends onto the roof – is this needed? There is concern with the greater prominence this gives to the new stairs/lift core”.

RESPONSE:

The new core needs to serve level 4, because the existing lift shaft is not adequate to provide disabled access to this floor. The staircase must also reach level 4, to allow the dry riser to serve all floors and to provide adequate fire fighting access.

PRE-APPLICATION FEEDBACK:

“Officers would advocate a more lightweight/transparent form (something that option 1 had to an extent achieved)”.

RESPONSE:

The south stair has limited opportunity to introduce glazing, due to it’s proximity to the existing facade and issues around potential fire spread. The east stair core has a combination of perforated aluminium panels and glazing.

PRE-APPLICATION FEEDBACK:

“The rectangular staircase design options 1 and 2 whilst sitting tightly adjacent the oriel windows to the lecture room would also abut tightly to the projecting upper floors – it is felt that the strong form, edge return and beams ends loose prominence”.

RESPONSE:

The new stair is pulled away from the existing building, creating a recess to give the articulation of the building some breathing space.

PRE-APPLICATION FEEDBACK:

“Position of the exterior ground floor doors should be moved a small distance away from the walling of the building rather than directly abutting it which is thought would improve the legibility of the building”.

RESPONSE:

The stair cores, as submitted, have the final escape doors pulled away from the existing fabric.

PRE-APPLICATION FEEDBACK & RESPONSE (CONT.)

NEW STAIR CORES (EAST)

PRE-APPLICATION FEEDBACK:

“At this stage Officers would have a preference of two rectangular additions on this elevation and perhaps configured different to reduce the need for such large landings to each floor level, but also to push these additions back from the northern end /features to the eastern end of the building that would be partially masked under the proposed scheme”.

RESPONSE:

In reducing the size of the western stair as much as possible, to limit the impact on the Oriel window, the eastern stair needs to be larger to cater for the fire escape capacity lost. Both lifts are sized to cater for the larger wheelchairs found on campus, as well as to cope with rush hour flows and it has been calculated that these larger lifts will be required to achieve an acceptable entrance/egress time.

PRE-APPLICATION FEEDBACK:

“Banding on the rectangular lift shaft should match that of the main building. Will the floor levels be the same as the main building?”

RESPONSE:

The intention is for the banding on the stair cores to relate to the existing levels. On the western stair this is a little difficult as there is a half level between the main block and the lecture theatre.

PRE-APPLICATION FEEDBACK:

“Will there be an internal ramp/ stair connecting the stair core/ lift extension to the main building? Concern this would not be suitable for those with disabilities”

RESPONSE:

Both the western and eastern stairs discharge at each primary floor level. There are no steps or ramps between the stair core and existing building.

STAIR PROPOSED PANEL PATTERN

PRE-APPLICATION FEEDBACK:

“There are concerns here if the perforations are small and or dispersed these aluminium screens could then appear to have an overtly solid appearance”.

RESPONSE:

The perforated aluminium cladding is designed to reflect the existing textured aluminium cladding. As per the existing cladding, from a distance the perforations look relatively solid but on approach the texture and relief is revealed.

DOUBLE HEIGHT PRINT ROOM

PRE-APPLICATION FEEDBACK:

“Want to ensure the beams remain expressed”.

RESPONSE:

In the two interactive teaching spaces the main ventilation equipment is housed in the adjacent single storey space. Therefore, the ceilings are relatively free from large services and simple lighting and vertical acoustic baffles are proposed, which will reveal the beams as much as possible.

PRE-APPLICATION FEEDBACK:

“Central division somewhat disrupts the rhythm and obscures the pattern of the beams is there an alternative approach to a room division that would still allow the crossing beam members to be seen uninterrupted run?”

“Solution could be to not have a full height partition and keep the upper part glazed. This will help create continuity through the space and retains beams being expressed.”

RESPONSE:

One continuous open space is too large and too long a volume for regular teaching. The intention would be to use the space in its open format for events and open days, and divide when the two teaching spaces are required. We have previously looked at a low moveable screen with glass above, but concluded this would not be suitable because of the following:

- To support the acoustic screen, a large structural beam at mid height would be required. Whether open or closed, this would be a very dominant feature and would detract from the ‘full open space’.
- Also, the glazed screen above would require substantial framing, due to the acoustic separation required.

INTERNAL STAIR CORES

PRE-APPLICATION FEEDBACK:

“Nosing detail to stairs – can the existing treatment be kept or replicated?”

RESPONSE:

We believe the existing nosing detail is ‘rubberised’ grip strips, set in cement grout and laid out in a channel formed in the concrete stair. The hope is to remove and replace the existing nosing detail with a matching solution. This does require further investigation on site to understand if the nosing detail can be removed cleanly without damaging the stair itself.

05 DESIGN APPROACH

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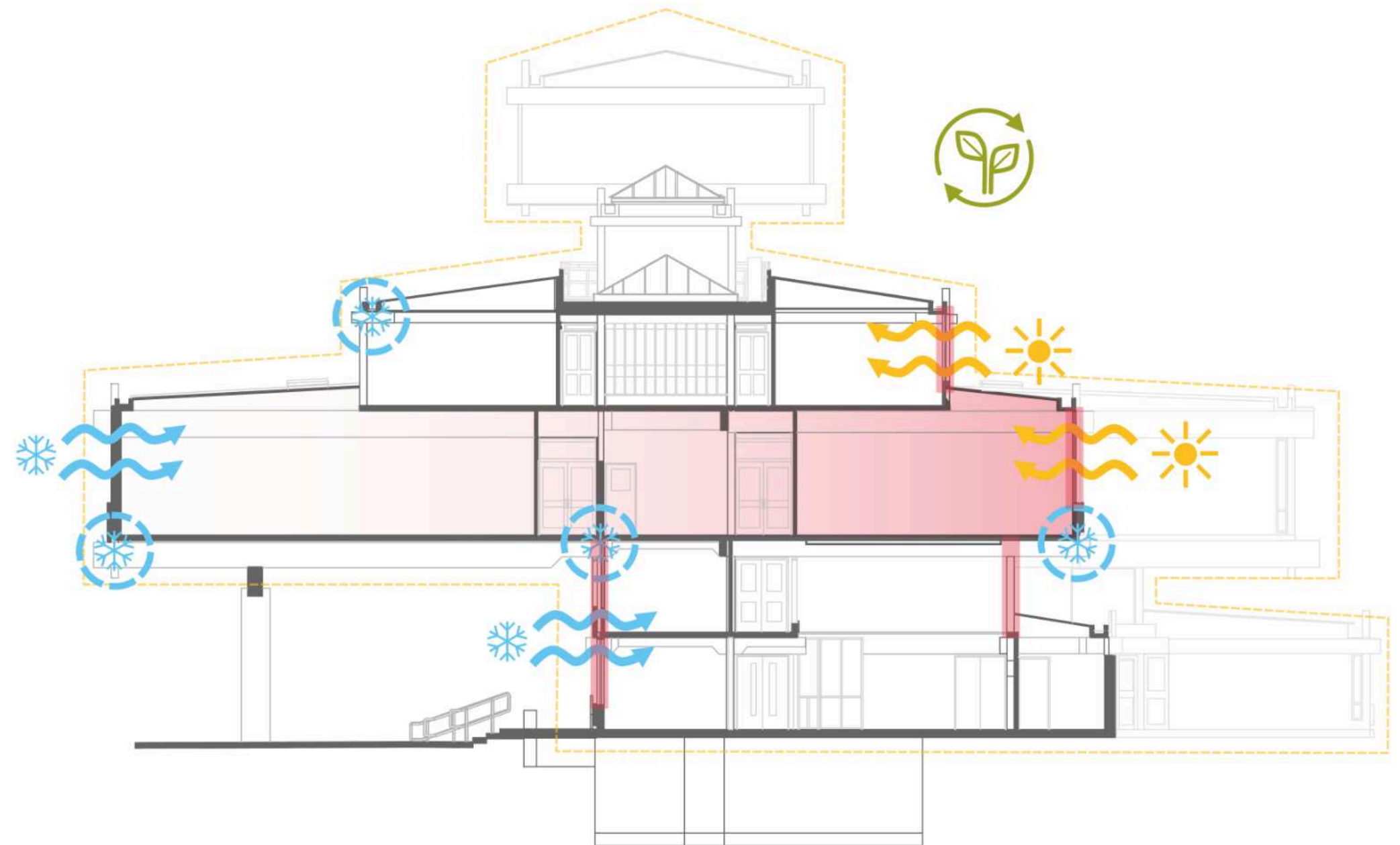
ENVIRONMENTAL CONSTRAINTS/CHALLENGES

SUSTAINABILITY CHALLENGE

Due to the heritage status and the structural and architectural principles of the existing building, limitations will be imposed on the extent to which fabric performance improvements can be implemented.

EXISTING ENVIRONMENTAL CONDITION

- Poor performing glazing throughout.
- Poor insulation & limited environmental control - significant temperature difference between north and south.
- Significant cold bridging in envelope.
- Very poor form factor, increases fabric heat loss.
- No existing renewable services.



01 Annotated diagrammatic section, highlighting environmental challenges in the existing URS building.

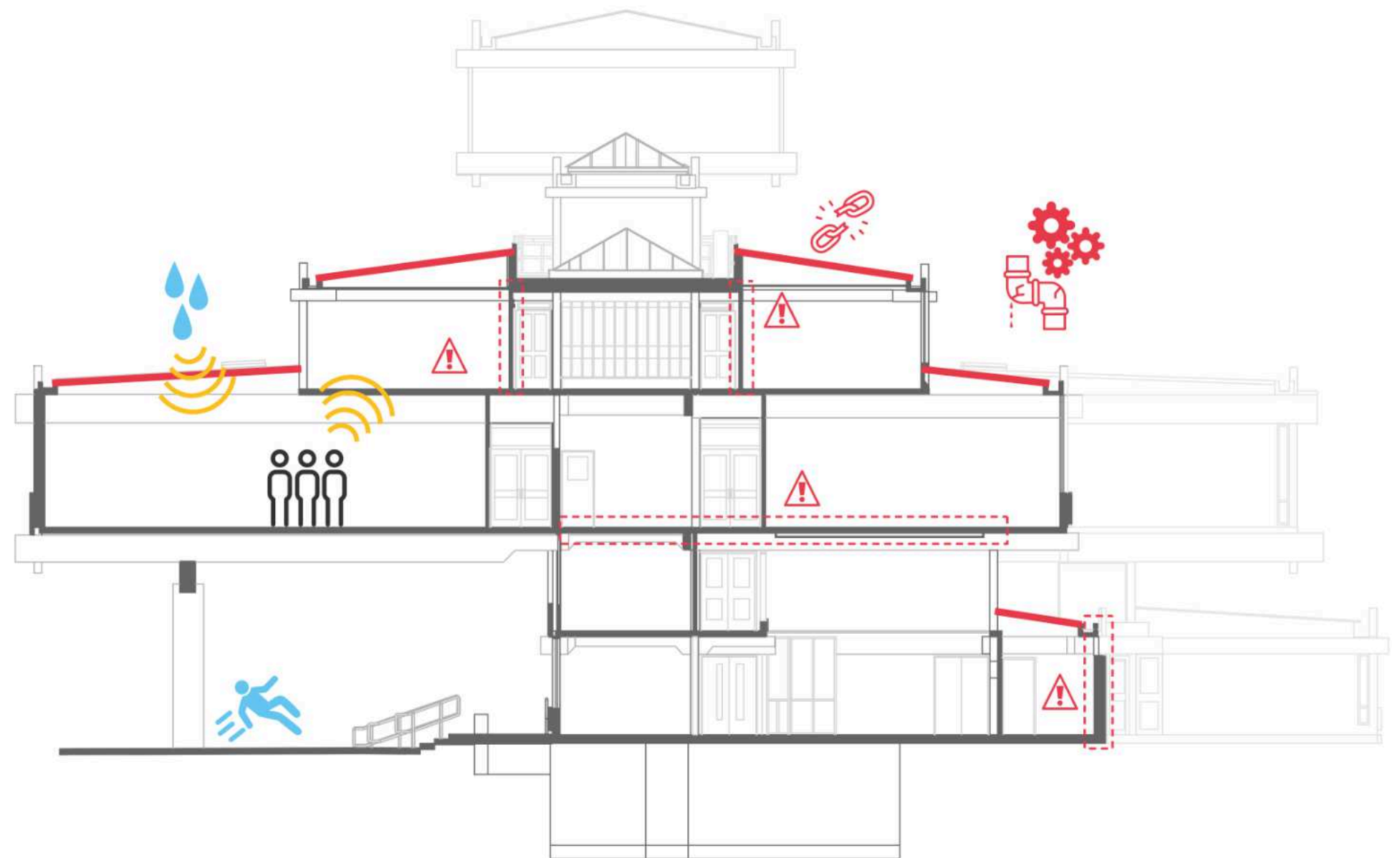
HERITAGE & BUILDING CONDITION CONSTRAINTS/CHALLENGES

HERITAGE LISTING CHALLENGE

The Grade 2 listing imposes significant constraints, although certain areas fall outside the designation. Post-war brutalist architecture is a growing heritage area with evolving knowledge and expertise.

BUILDING CONDITION

- Outdoor paving slippery when wet.
- Acoustic issues - rainfall & internal transmission.
- Asbestos present.
- Roof failure in many locations.
- Post tensioned beams limit adaptability.
- Building services beyond life expectancy.
- Significant concrete & structural issues.
- Internal drainage runs from roofs.



01 Annotated diagrammatic section, highlighting building condition challenges in the existing URS building.

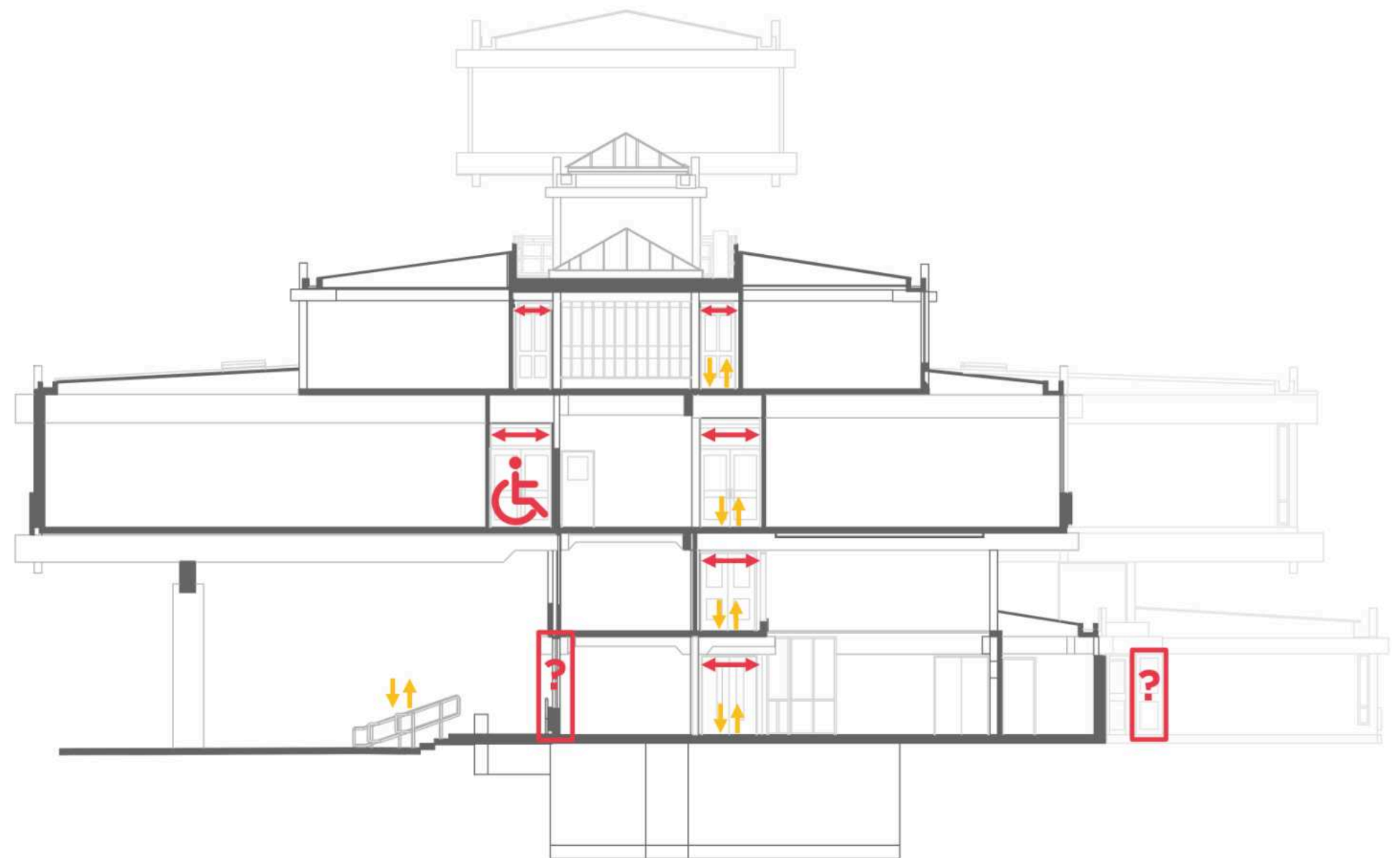
EXISTING BUILDING CONSTRAINTS/CHALLENGES

LIMITATIONS OF EXISTING BUILDING

The growing student population is a positive development for the University; however, accommodating this increase within an existing building poses challenges in ensuring equitable disabled access, ensuring safe fire egress, and maintaining a comfortable and pleasant environment for use.

ACCESS

- Poorly defined entrances and exits.
- Small lifts and narrow corridors not compliant with current disability requirements.
- Half level access to lecture theatres.
- Mostly stepped external approach.



01 Annotated diagrammatic section, highlighting access challenges in the existing URS building.

CONCEPT

The overarching layout strategy aims to integrate appropriate spaces within existing volumes, minimising disruptions. This is a heritage led project and our aim is to try to respect the existing building where possible.

Therefore, smaller admin/cellular spaces are primarily located on the first floor, utilising the narrower plan and suitability for such spaces. Larger existing spaces are allocated to the large teaching spaces. Generally, the teaching spaces are grouped around small breakout and informal study spaces, making use of the central circulation areas illuminated by the atrium light wells.

The CME teaching spaces are grouped on the third floor, fostering departmental cohesion and a sense of identity, with administrative and ancillary spaces dispersed among the teaching spaces on both the first and third floors.

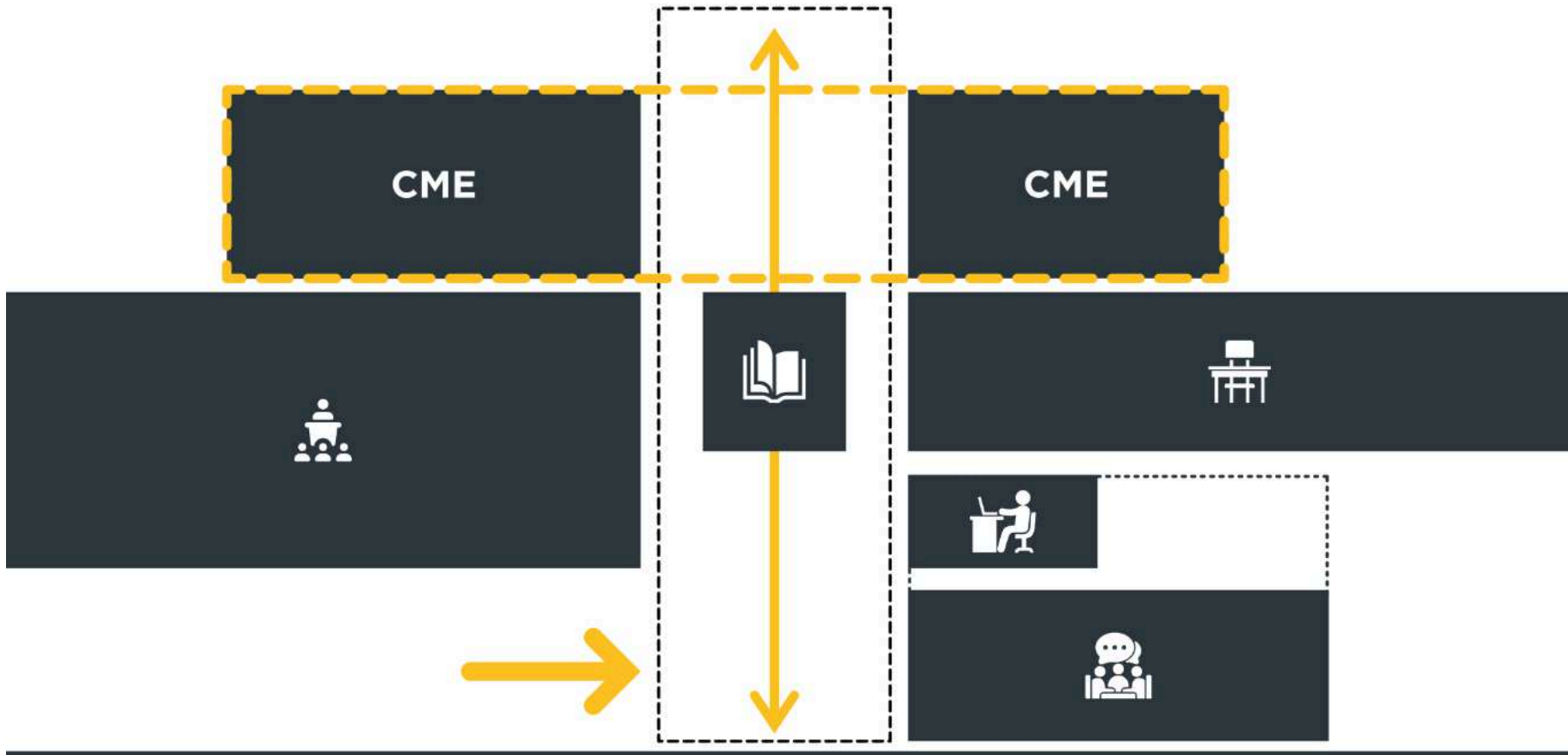
Significant effort has been made to retain double height spaces and find appropriate uses that work in the spaces. Lecture theatres are logically placed in existing lecture theatre spaces.

Internal walls, where permitted by the Heritage Listing, will be removed to permit the new arrangement.

Some walls outside of the exemption stated in the listing will need to be altered or removed, particularly on the third floor where the existing corridor is too narrow for comfortable wheelchair use.

While the existing stairs are considered significant in a heritage context, some minor modifications will be proposed and permission sought to improve legibility and fire protection. Two out of the three existing internal stair cores will need lobbies and improved fire rating, and two new external stair/lift cores will need to be added for fire escape capacity (further explored later in the report).

External fabric upgrades are studied later in this report.



06

ENVELOPE

AYRE
CHAMBERLAIN
GAUNT

WINDOW REPLACEMENT

EXISTING WINDOWS

- Existing windows are single glazed aluminium framed. Frames are not thermally broken.
- Manufacturer is identified as Luxfer on original drawings.
- Window fenestration patterns vary on a floor by floor basis. While there are clear fenestration patterns, some areas seem to fall outside the general strategy. Fenestration patterns are further analysed in the coming pages.
- Key heritage and planning drivers include the slim window section widths and the general fenestration pattern making across the building.
- It is not felt that the original material used (mill finished aluminium) is significant in terms of heritage. Its is likely that new aluminium windows would be powdercoated, therefore alternative materials could be proposed.



- 01** Exterior photo of existing glazing on south facade.
- 02** Interior photo of existing glazing on north facade.
- 03** Interior photo of existing glazing on north facade.
- 04** Photo of internal courtyard glazing.

WINDOW REPLACEMENT

EXISTING WINDOW TYPES

The design team have identified multiple windows types, which are repeated throughout the building. **To view the full analysis, please refer to sheet 2360383-ACG-W033-ZZ-DR-A-21400 & 21401 in the drawing pack.**

A selection of the **existing** window types:

- Type 1 - Fixed pane with top hung above (used predominately on the second floor). Generally fanlight responds to beam depth.
- Type 2 - Three panes, with one vertical sliding (used on the second floor). Strong horizontal emphasis.
- Type 3 - Two symmetrical vertical sliding panes (used on ground floor, first floor and third floor). Strong vertical emphasis.
- Type 4 - Two symmetrical vertical sliding panes (used on the second floor). Combination of type 1&3.

It should be noted that Type 4 appears to not follow the general fenestration patterns on the north and south facades, it seems likely it was introduced to deal with random internal partition arrangements which are no longer relevant, so has not been included in the proposed window types.

A selection of the **proposed** window types:

- Type 1 - Fixed pane with top hung projecting above, closely matching the original proportions and configuration.
- Type 2 - Three panes, with two top hung projecting above, closely matching the original proportions and configuration.
- Type 3 - Two symmetrical vertical side hung panes. The minimal horizontal transom to the sliding sash has not been replicated, as it is a secondary element in a strongly vertical pattern and its introduction would have no functional reasoning. Also, with modern glazing sections it would be too strong an element, giving the effect of a cross rather than the vertical bias of the original window.

The following pages explore window fenestration patterns and fanlight analysis.



WINDOW REPLACEMENT

FENESTRATION DEVELOPMENT

An analysis of the existing windows was completed to understand the rationale behind the fenestration patterning.

It was clear during this analysis that there was an over-arching alternating ‘flip-flop’ pattern along the horizontal axis of the second floor (shown in Figure 01).

As part of the proposals, we have aimed to maintain and, in some cases, reinforce this alternating window pattern on level 02 (shown in Figure 02).

In some areas we have chosen to deviate from the existing patterns where there is good reason. For example, where very large fixed single panes of glass are now replaced by a window with an additional transom at guarding level, to enable additional opening lights to increase ventilation. Another example, rooms with MVHR kit that do not have access to clear roof space above will instead integrate a louvre into the window configuration. This can be seen on the south facade, where we have proposed Active Travel space.

Each colour overlay on the drawings represent a different window type/fenestration pattern.

KEY:

- 1x1 Bay
- 1x2 Bay
- 1x3 Bay
- 1x4 Bay
- 2x2 Bay
- 2x3 Bay
- Curtain Walling
- Oriel Window
- External Door

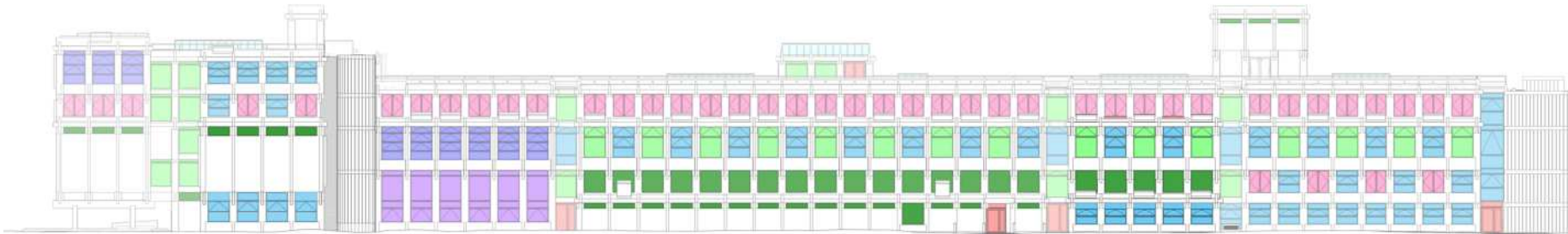
EXISTING

01



PROPOSED

02



- 01 Annotated south elevation showing existing window fenestration patterns.
- 02 Annotated south elevation showing proposed window fenestration patterns.

WINDOW REPLACEMENT

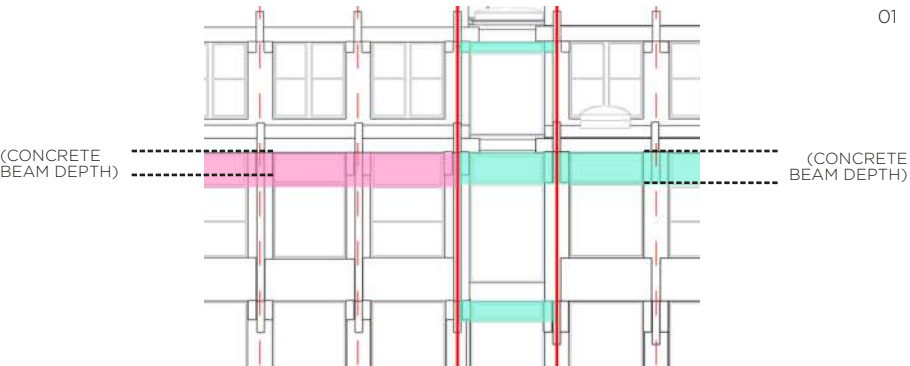
FANLIGHT ANALYSIS

As part of the window replacement study, fanlight depths were analysed. In most cases across the building, fanlight depths match that of the neighbouring concrete beams. However, some areas on the south facade (highlighted in pink) do not match up with the neighbouring concrete beam depth. It is believed that these fanlights are instead mirroring beam depths from further along the axis (shown in Figure 01).

Below is a enlarged image of the south elevation displaying fanlights that do not match the expected pattern.

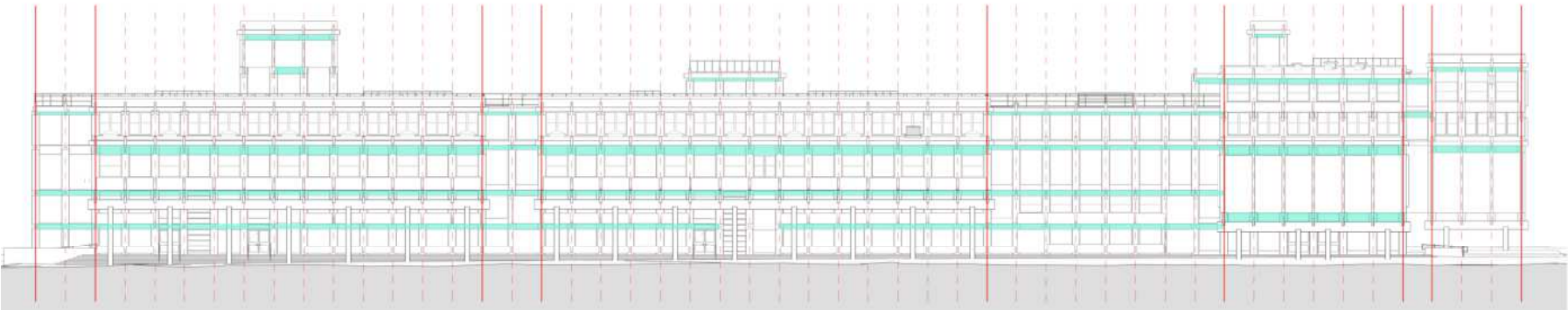
Generally we have respected fanlight height strategy on the proposal.

- = Fanlight height **does** match neighbouring concrete beam depth.
- = Fanlight height **does not** match neighbouring concrete beam depth.



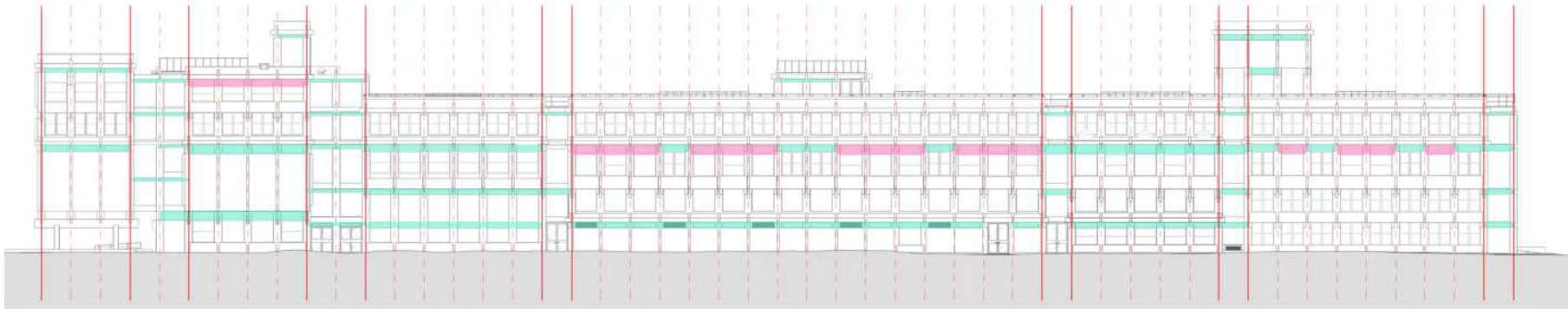
NORTH

02



SOUTH

03



- 01 Zoomed in annotated north elevation showing existing fanlight patterns.
- 02 Annotated north elevation showing existing fanlight patterns.
- 03 Annotated south elevation showing existing fanlight patterns.

WINDOW REPLACEMENT

The design team explored a number of different window replacement types including aluminium, steel and composite windows (aluminium external faced with a timber internal finish). The options were assessed by the team in terms of value, thermal performance and heritage risk. Our conclusion from this exercise and strong recommendation is composite window replacement strategy, which scored highly against each criteria.

Please refer to 2360385-ACG-W033-ZZ-DR-A-42210 from the drawing pack for more information.

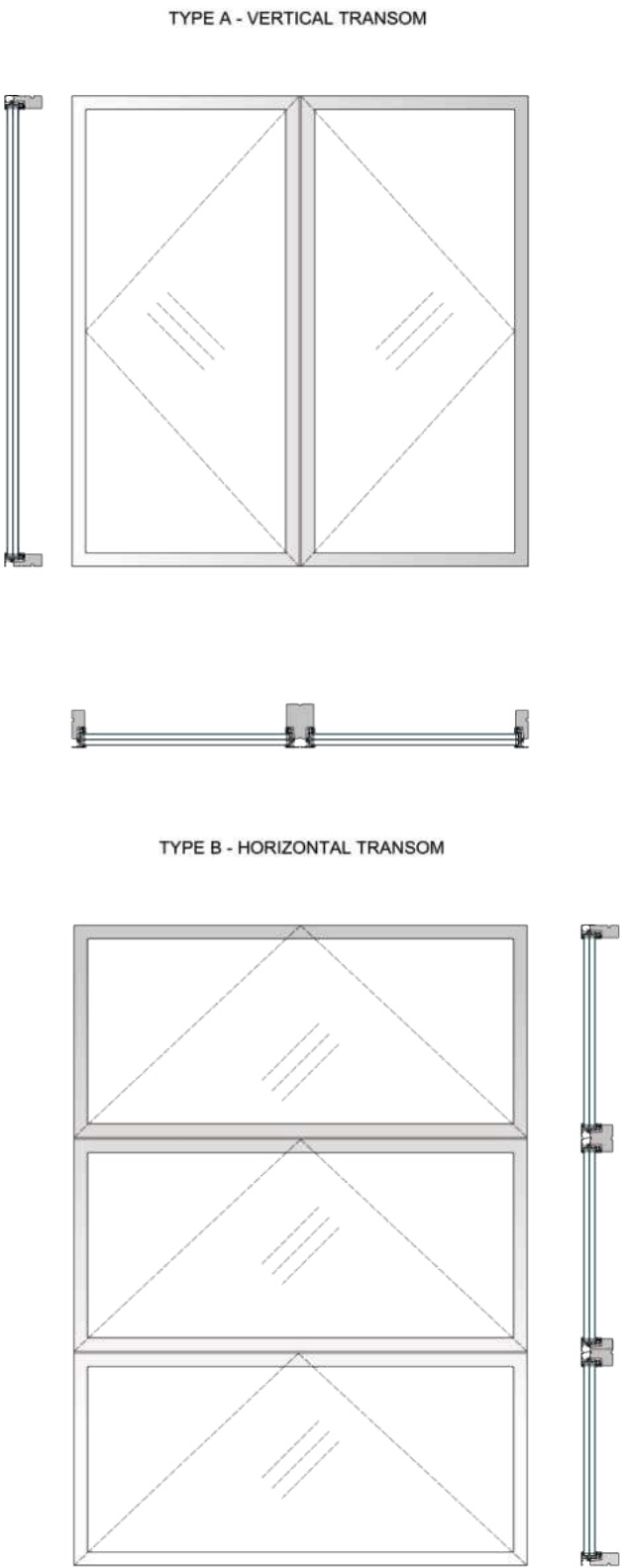
COMPOSITE

- Proposed window replacement - timber/aluminium composite.
- Face Width = approx. 50/100mm.
- Glazing = Up to 44mm (triple).
- Typically used as open outward. The external finish is powder-coated aluminium, which will be a close match to the original mill finish.
- Outward opening maximises airflow, top hung projecting is proposed in areas that are cleanable from the ground. Side hung are used in areas that can be cleaned from the inside.
- Typically frame and opening light combined giving a slim sight-line as a single panel, but full double frame when multiple panels are configured.
- Timber reduces embodied carbon impact but is a significant move away from the materiality of the existing windows, although it responds to the internal timber screens well.
- Although not a direct response to the existing aluminium sections, when using multiple opening lights the composite frame section can read as quite slim because both a fixed and opening light are the same width.

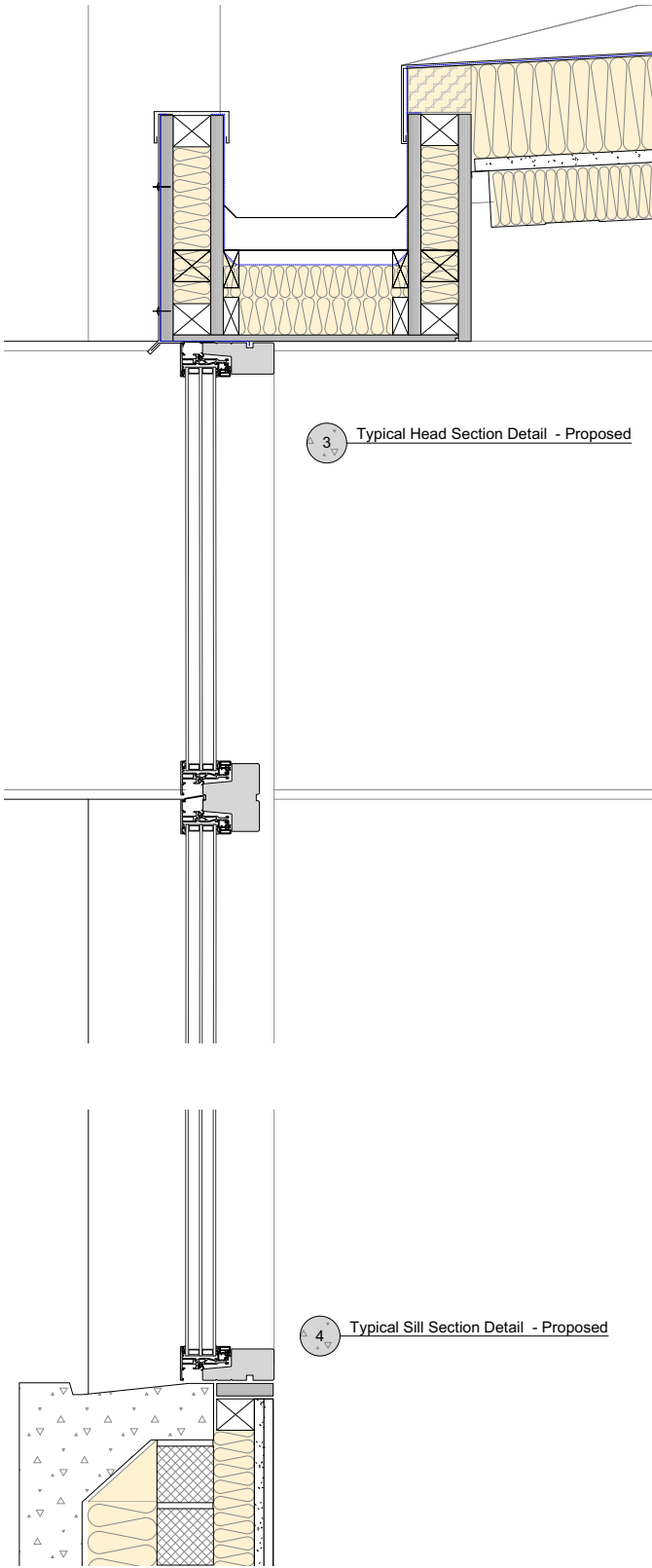


01 Composite window detail image.

COMPOSITE FRAMED SIGHT LINES



02 Composite window detail drawing (nts).



02

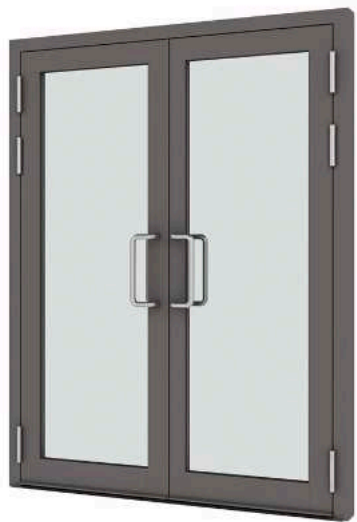
EXTERNAL DOOR REPLACEMENT

EXISTING EXTERNAL DOORS

- Non-powered, manual door openings.
- Single glazed, so poor thermal performance.

PROPOSED EXTERNAL DOORS

- Proposed external doors will be commercial grade aluminium doors. These doors need to deal with a lot of traffic.
- Maximise transparency.
- Improved entrance accessibility, with power-operated doors.
- Inviting, clear entrance route.
- Triple glazing, so improved thermal performance.



01 Existing main entrance doors.
02 Existing secondary entrance doors.
03 Aluminium commercial door precedent image.
04 Aluminium commercial door product image.

ROOF REPLACEMENT

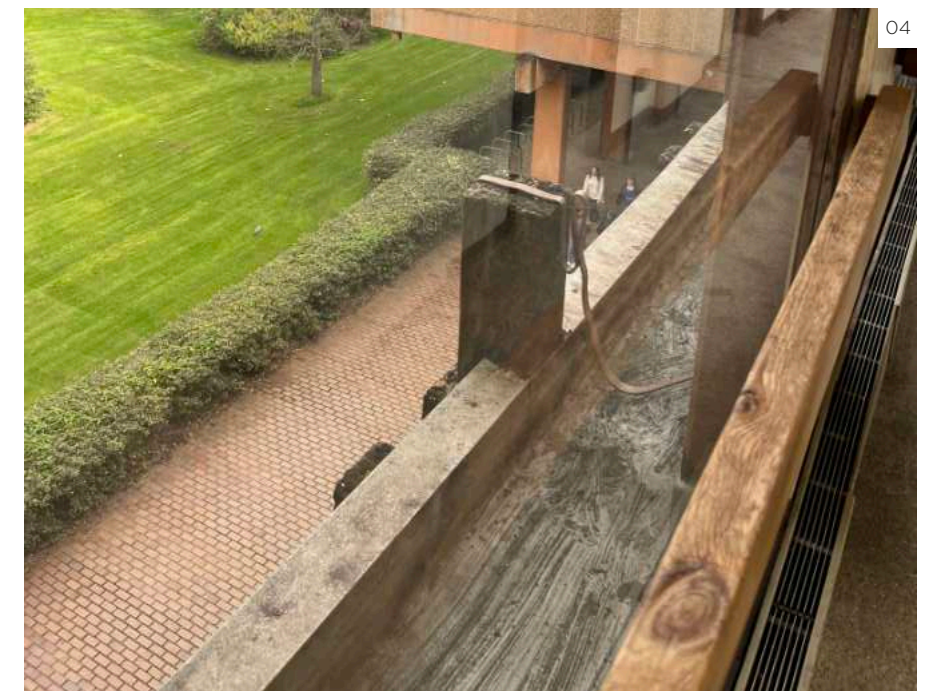
EXISTING PITCHED ROOF

- Existing roof finish is a standing seam metal, in an unpainted finish. Original drawings indicate both aluminium and zinc. It is believed that the material used was a textured aluminium sheet.
- In addition there are aluminium fascias and illustrated are integrated gutters lined in 3 layer felt with aluminium trims. To be confirmed on site inspection.

EXISTING FLAT ROOF

- Original drawings indicate felt over screed, over woodwool deck.
- It looks like the roof has been recovered, probably overlaid with single ply membrane and additional insulation.

The existing roof is in a poor state, leaks, and has caused damage to the structure below. Therefore, the planning application proposes a full roof replacement.

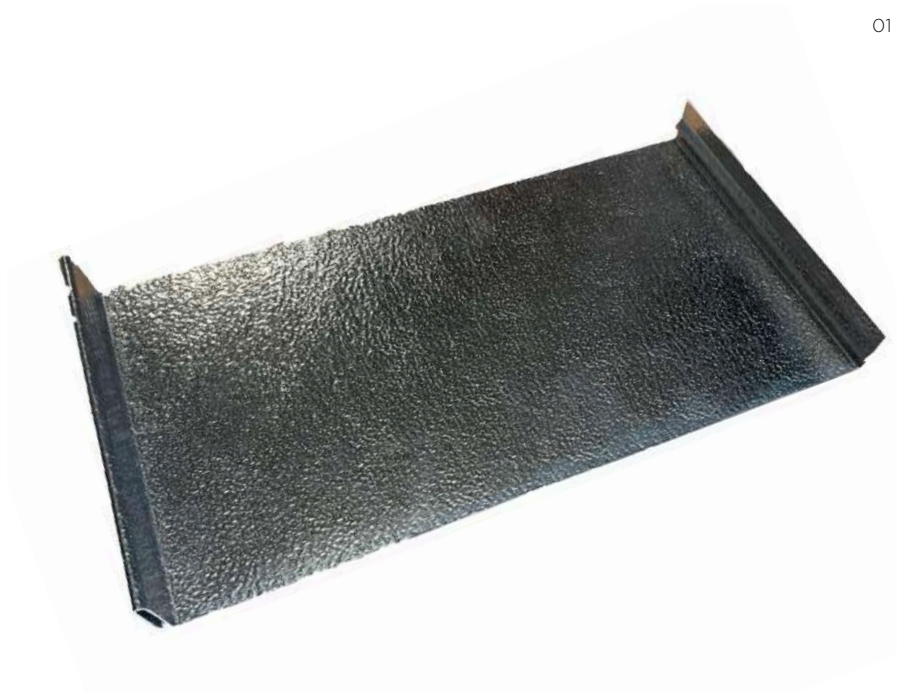


- 01 Existing pitched roof standing seam.
02 Existing pitched roof.
03 Existing flat roof and handrails.
04 Existing roof gutter.

ROOF REPLACEMENT

PITCHED ROOF REPLACEMENT

- A direct replacement of like for like aluminium standing seam is proposed for heritage reasons, in order to maintain the external appearance.
- Available in textured stucco aluminium as a mill finish as existing or painted for a similar effect without future weathering.
- Therefore opting for the mill finish, an almost identical replacement for existing roof finish is available.
- Aluminium, while having a high embodied carbon impact, is infinitely recyclable. Its quite possible that the existing roof could also be recycled.



01

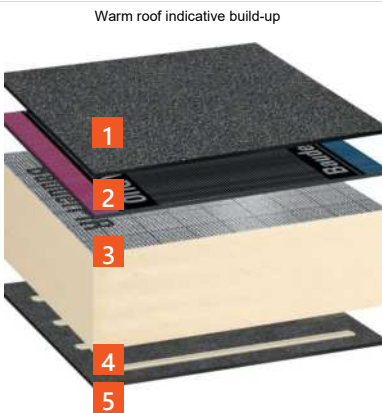


02

FLAT ROOF REPLACEMENT

- Reinforced bitumen membrane.
- These systems can sustain heavy foot traffic as well as loads associated with the installation and maintenance of typical rooftop plant.
- This system is considered the gold standard in flat roofing solutions. The university will want to avoid poor quality flat roofing which can often be the cause of ongoing maintenance issues.
- Would be used as part of a total roof replacement in a warm roof configuration.
- As the existing flat roof has had the later addition of a new membrane and insulation overlay, the overall thickness and height is unlikely to change when replaced.

	Function	Product name	Thickness (mm)	Weight (kg/m²)	Warm roof indicative build-up
1	Cap sheet	BauderKARAT (Charcoal grey)	5.2	6.0	
2	Underlayer	BauderTEC KSA DUO 35	3.5	4.0	
3	Insulation (0.15)	BauderPIR FA-TE	140	4.2	
4	Insulation attachment method	Bauder PU Tin Adhesive	nominal	0.16	
5	Air and vapour control layer (AVCL)	BauderTEC KSD FBS	2.5	2.5	
	Primer	Varies depending upon substrate type – please refer to specification	nominal	nominal	
System Build-up			151.2	16.86	
In-depth and up-to-date product specific technical data is available for each element within a system. Download from our website bauder.co.uk/technical-centre					



03



04

- 01 Replacement aluminium roof sheeting-textured mill finish (will oxidise over time).
- 02 Precedent image - pitched roof.
- 03 Precedent image - flat roof.
- 04 Precedent image - flat roof.

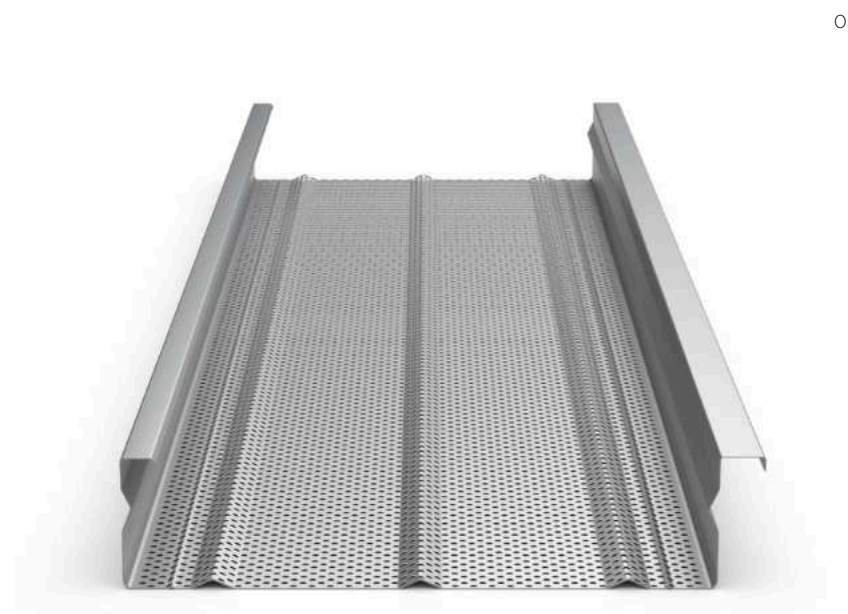
ROOF DECK REPLACEMENT

EXISTING ROOF DECK

- Existing roof deck structure consists of framed woodwool slabs for both the pitched and the flat roof areas.
- The intention is a full roof replacement, which includes the existing woodwool roof deck slabs.
- There are no modern direct replacements for woodwool structural decks.
- Woodwool is a very light deck, its replacement must not overload the buildings structure.
- Full replacement allows much improved insulation levels to be achieved.

PROPOSED STRUCTURAL LINEAR TRAY

- Replacement needs to be lightweight, capable of significant thermal efficiency while remaining slim and to have a generally flat soffit.
- Proposal is a structural metal linear tray deck, with acoustic perforations, spanning between the existing concrete structural beams.
- The deck would be flat and have a 600mm linear grid as per the woodwool.
- While clearly not the same materiality as a woodwool slab, the perforations will add texture to the soffit as well as helping acoustic attenuation.
- Significant levels of mineral wool insulation can be incorporated.
- Overall build up increases but the thickness increases downwards so not effecting the gutter and verge line.



- 01** Existing woodwool panel roof deck.
- 02** Existing woodwool panel roof deck.
- 03** Detail image of proposed perforated metal tray deck.
- 04** Indicative precedent image of perforated metal roof deck.

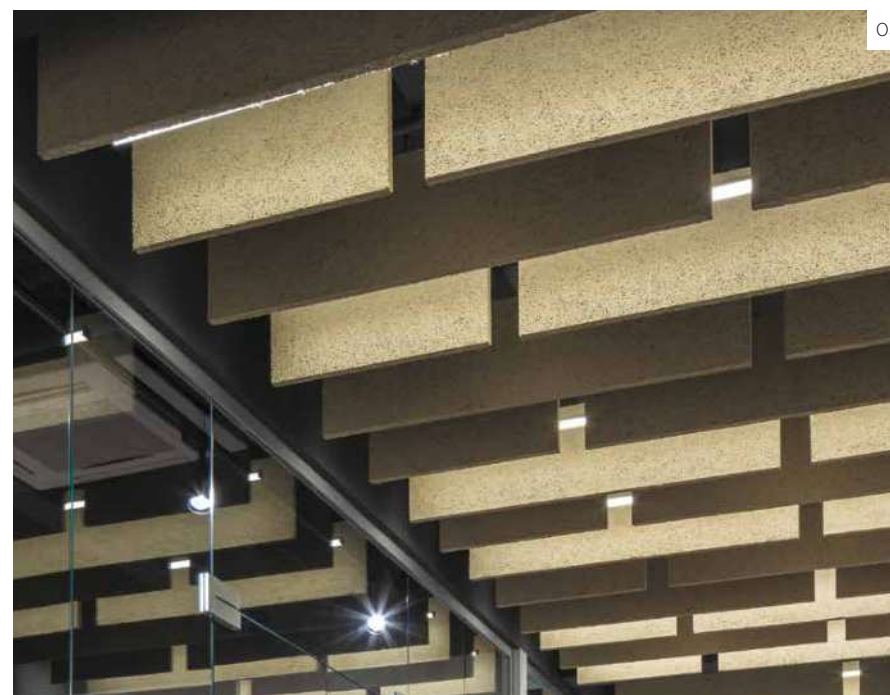
CEILING REFURBISHMENT

EXISTING CEILINGS

- The existing building generally does not have ceilings and the spaces open up to the underside of the woodwool roof deck.
- There appears to be a timber lining to the roof deck in the lecture theatre. It's unclear if this is original, but could be due to its acoustic performance.
- There are also some areas that are clearly later additions to ceilings - from full suspended lay in grids, to individually suspended acoustic baffles.

PROPOSED STRATEGY

- The refurbished building will likely have considerably more ceiling mounted mechanical ventilation equipment in many of the spaces. These services would generally be exposed fixed to the roof deck and partially screened by the acoustic baffles where needed.
- It is important for the structure to be expressed as much as possible.
- The proposed ceiling solution will include woodwool acoustic panels, loosely suspended in horizontal and vertical format.
- Woodwool is a lightweight acoustic ceiling solution that will visually screen the soffit mounted mechanical plant while being set away from the the primary concrete beams.
- Woodwool is well placed as a ceiling finish that references the original woodwool structural deck.



01 Existing suspended ceilings in the classrooms.

02 Existing suspended acoustic baffles.

03 Proposed woodwool acoustic baffles hung in a vertical format.

04 Indicative image of exposed mechanical ventilation, fixed to roof deck.

ROOF HANDRAIL REFURBISHMENT

EXISTING ROOF HANDRAIL

- The existing rooftop handrail appears to have a later addition bolted on top, likely to increase handrail height when the roof was overlaid with additional insulation and new membrane in the past.
- The handrail running along the pitched roof is the same height as the bolted on addition, so it is likely this is also a later attachment to the roof.
- It also seems as if the additional intermediate rails have been added since the building was originally completed.

PROPOSED ROOF HANDRAIL STRATEGY

- As the existing handrails are both in a poor state and heavily modified from original, it is proposed to remove and replace these with a more sympathetic design.
- Tubular steel guarding will be silver in colour, to tie in with the roof and window frames.
- Guarding height and design will be compliant with current regulations, which will require a rail along the upstand edge, but this will be set back to align with the full height guarding.
- Existing roof fixing points will be reused where possible.



01 Image of the original roof handrail system, taken from the November 1973 issue of the Architectural Review magazine.

02 Image of the original roof handrail system, taken from the November 1973 issue of the Architectural Review magazine.



03 Existing roof handrail.

04 Indicative visual of proposed roof handrail system.

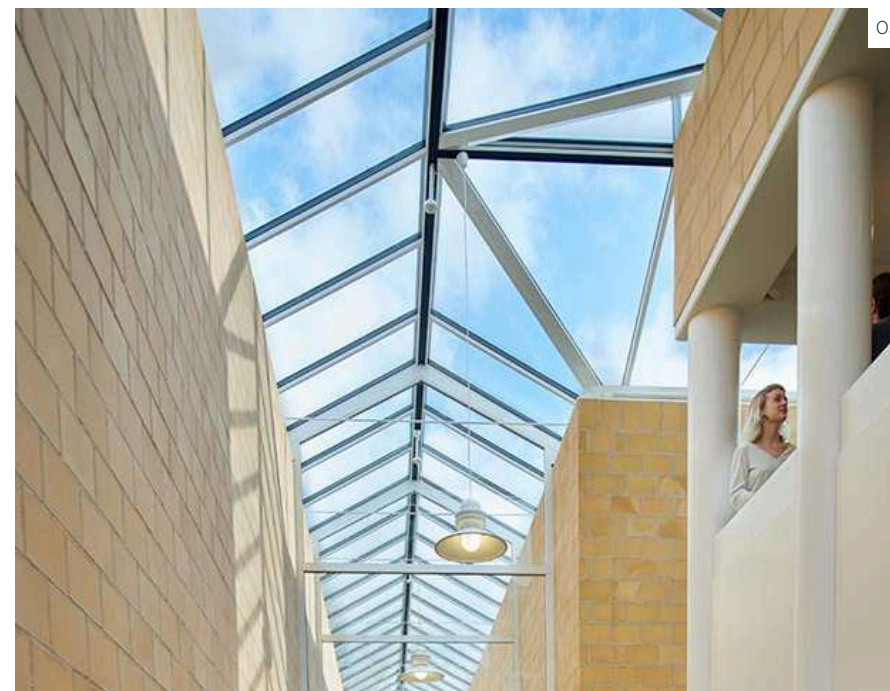
ROOF LANTERN REPLACEMENT

EXISTING ROOF LANTERNS

- Existing glazing panels are Georgian Wire glass.
- Single glazed window panes, so poor thermal performance and inevitable condensation issues.
- Subject to both water and air leaks.

PROPOSED ROOF LANTERNS

- Proposed roof lantern will be 'new dual pitched aluminium' system, matching the pitch and modules where possible.
- Replacing the roof lanterns presents an opportunity to also provide ventilation for cooling and smoke vent, through automatic openable panels - approximately 10% will be openable.
- Triple glazing throughout to improve thermal performance.



- 01 Existing roof lantern in atrium space.
02 Existing roof lantern above stairwell.
03 Proposed aluminium roof lantern.
04 Proposed aluminium roof lantern.

ROOF LIGHT REPLACEMENT

EXISTING ROOF LIGHTS

- Existing roof light size approximately 1200mm x 1200mm.
- Single glazed, so poor thermal performance.
- Likely condensation issues.

PROPOSED ROOF LIGHTS

- Rectangular shape to fit between concrete beams, reducing the need for trimming structure.
- Proposed dimensions of approximately 800mm x 2000mm.
- Triple glazing, so improved thermal performance.



01 Existing roof light.
02 Existing roof light in classroom space.
03 Proposed roof light precedent.
04 Proposed roof light precedent.

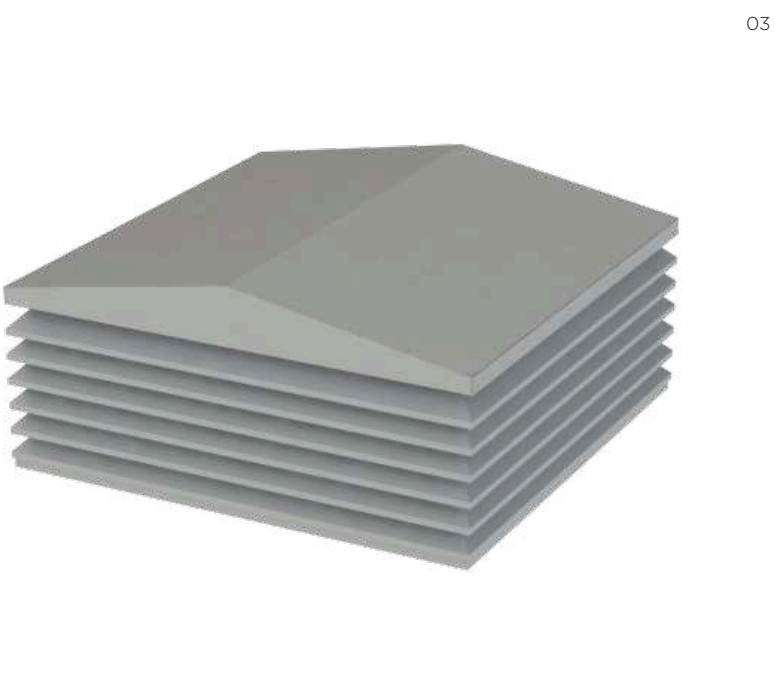
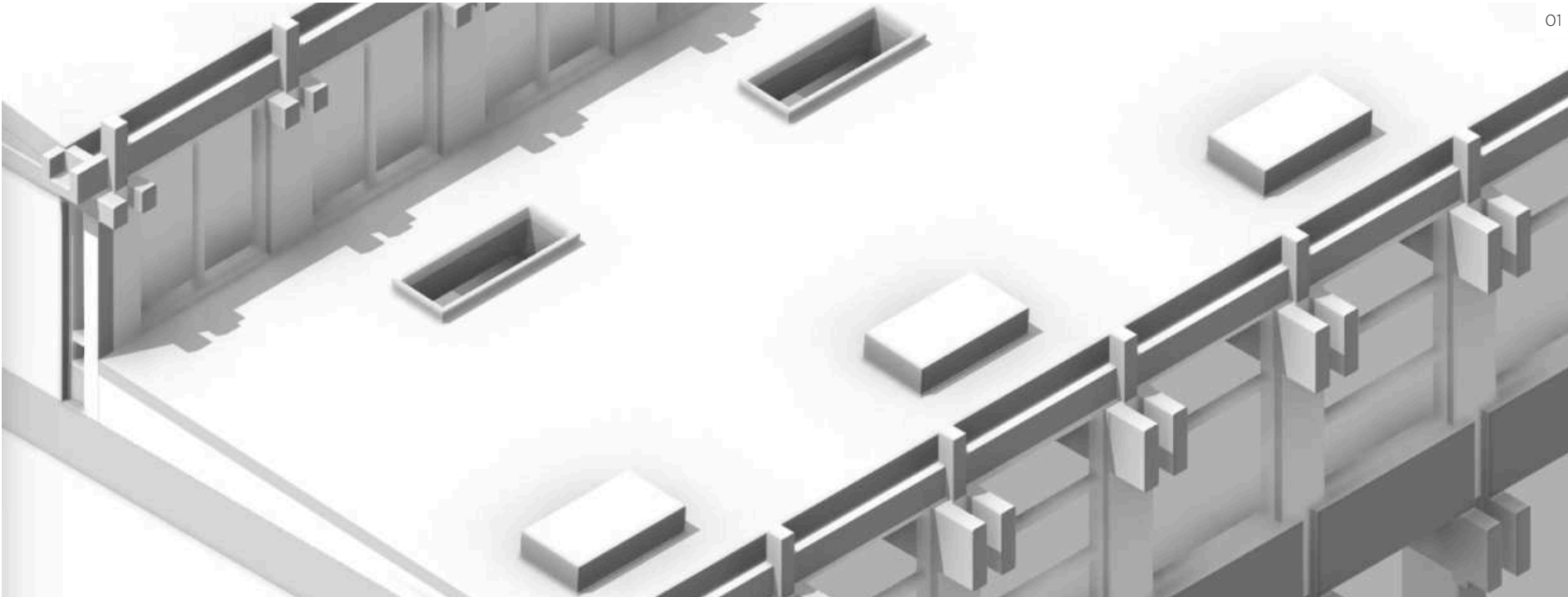
ROOF COWL REPLACEMENT

EXISTING ROOF COWLS

- There are several roof cowls on the existing building of varying sizes and styles.

PROPOSED ROOF COWLS

- The proposed development will require a comprehensive strategy for ventilating the building. This requires new roof ventilation cowls on the roof.
- The cowls will be formed in a similar material to the roof finish.
- Locations are illustrated on the roof plan drawings.



01 Indicative 3D model of proposed cowls.
02 Existing roof cowl.
03 Precedent image of proposed roof cowl.

SOFFIT REFURBISHMENT

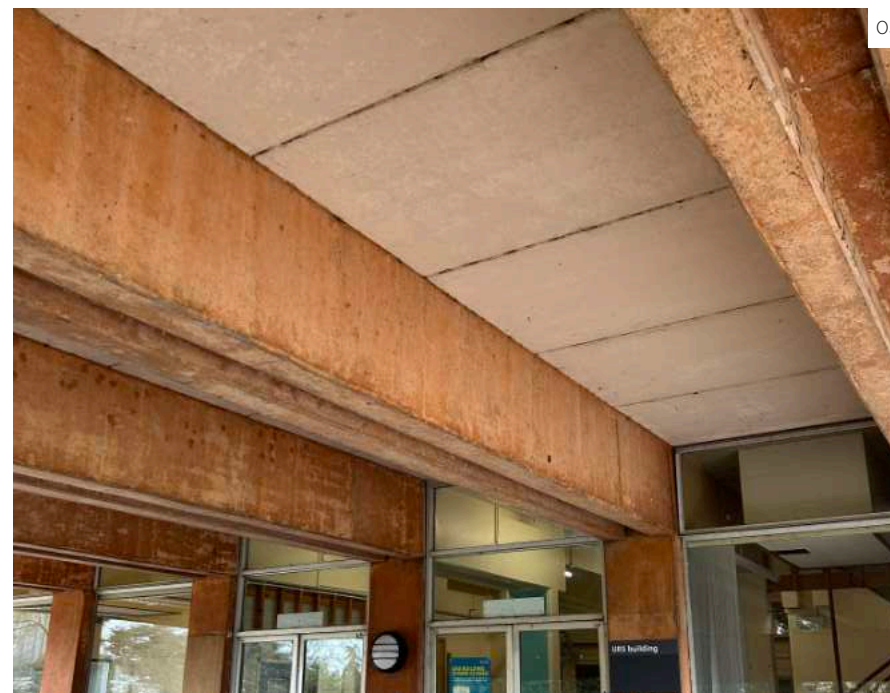
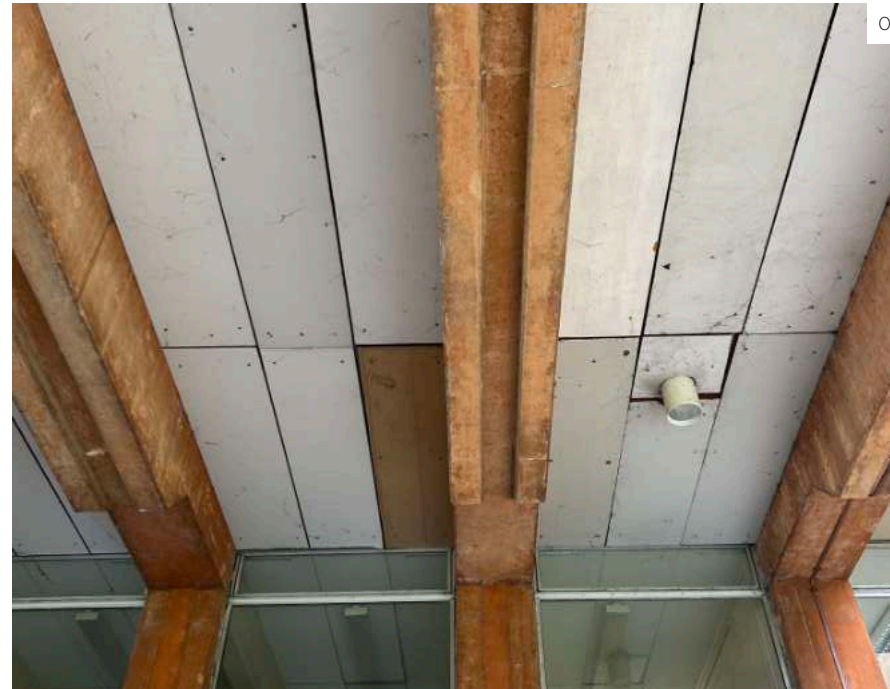
EXISTING OVERHANG SOFFIT

- There are some areas of exposed concrete soffits above the single-storey main entrance space.
- The existing concrete soffit is heavily recessed allowing the beams to be fully expressed, which is a key heritage feature.
- Most double-height areas have a suspended soffit board fixed to the underside of the structural slab.
- This soffit board is in a poor state with panels falling off.
- An edge trim is used to mask the depth of the soffit board.
- Large cold bridge through exposed slabs and beams.

PROPOSED OVERHANG SOFFIT STRATEGY

The original intention was to insulate the overhangs with an upgraded insulated soffit. Since receiving planning feedback on the Phase 2 application, this strategy has changed to the below:

- Removal of existing soffit boards, to expose original concrete deck.
- Thermal improvements will instead be achieved by introducing a new thermal concrete screed to the internal flooring. This has the benefit of fully reducing the thermal bridges through the beams, as well as being considerably lighter than the original screed being replaced, which is also at end of life.
- By insulating internally and removing the ill fitting soffit panels we allow the beams to be fully expressed passing beneath the building.



- 01 Existing soffit overhang with cladding panels.
02 Existing soffit overhang with cladding panels.
03 Existing soffit overhang - exposed.
04 Existing soffit overhang - exposed.

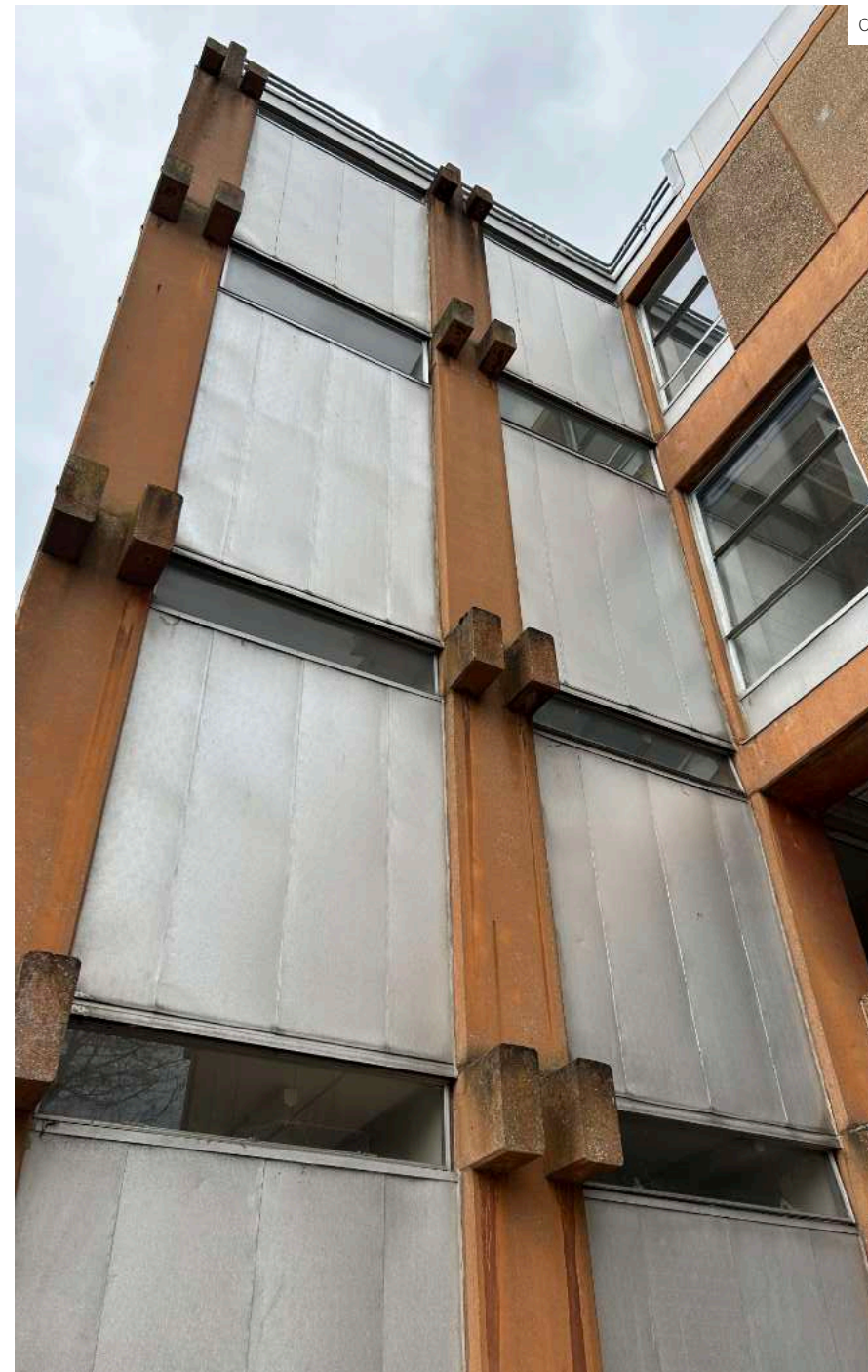
ALUMINIUM FACADE PANELS

EXISTING ALUMINIUM PANELS

- The existing aluminium panels appear across the URS building, either as sheet facade material or as spandrel panels below windows. The existing material is a textured mill finish aluminium, as per the roofing sheet.

PROPOSED ALUMINIUM PANEL STRATEGY

- The proposal seeks to retain all existing aluminium cladding panels in principal.
- The cladding will be lightly cleaned and inspected. In some cases the aluminium material may have existing damage or it may be impossible to remove the existing windows without causing damage. If this occurs, the intention is to replace the cladding with a 'like for like' textured aluminium sheet from the same source as the roof sheeting.



- 01 Existing aluminium facade panels on east-end of building.
- 02 Existing aluminium facade panels beneath windows.
- 03 Replacement aluminium sheeting where required-textured mill finish (will oxidise over time).

CONCRETE REPAIR

OVERVIEW

Purcell have been commissioned to prepare a concrete repair strategy for the external concrete building elements at the URS Building, in line with recommendations set out by the Getty Conservation Institute in their publication, Conservation Principles for Concrete of Cultural Significance. Purcell has undertaken a detailed visual inspection of the building and identified a series of defects, which have been assigned priority ratings depending on their condition and location. The report includes outline repair methodologies, which will be trialled and refined prior to implementation.

Purcell’s assessment focuses on improving the overall appearance of the building as part of the wider redevelopment and addressing poor previous interventions. The nature of the concrete repairs are aesthetically rather than performance driven.

The range of defects identified in Purcell’s report, and illustrated here, include cracking and spalling of concrete, corrosion of reinforcement, poorly matched historic repairs, displacement of pre-cast panels, various types of staining and surface deposits. Recommended repairs include cast in-situ concrete repairs, hand-placed mortar repairs and sensitive cleaning.

A structural assessment of the building has been undertaken by Structural Engineers, Curtins, with intrusive investigations carried out by CRL. Recommendations for structural repairs and potential future protection of the structure, including cathodic protection and the application of anti-carbonation coatings are addressed by Curtins in the “Strategies” section of this report. The specification and application of structural repairs will be closely informed by Purcell’s concrete repair strategy, to ensure acceptable aesthetic finishes.



- 01 Weathered concrete beam.
- 02 Pre-cast concrete panel cracking.
- 03 Temporary concrete repair patch repairs.
- 04 Chipped concrete, showing the rebar beneath.

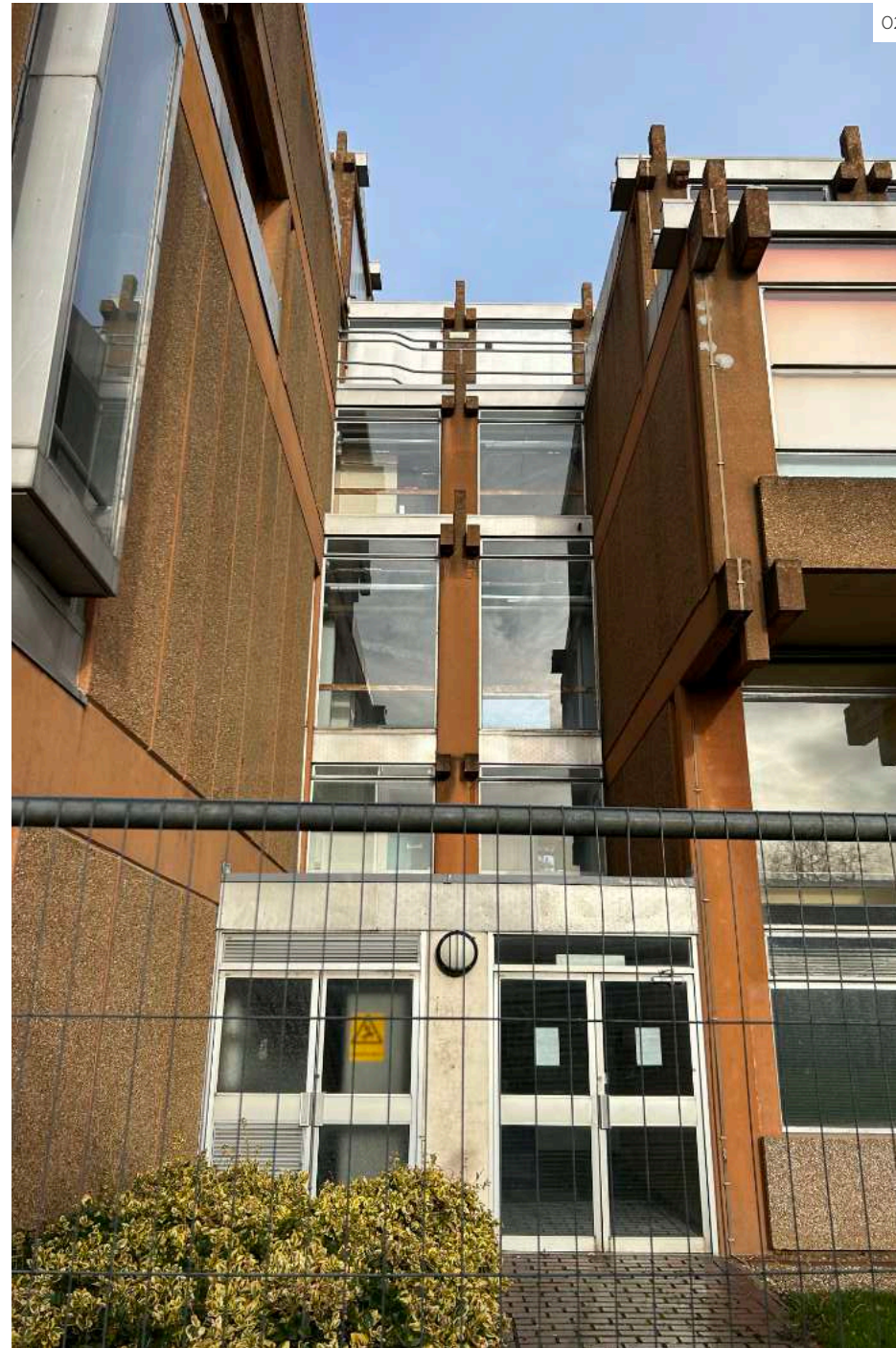
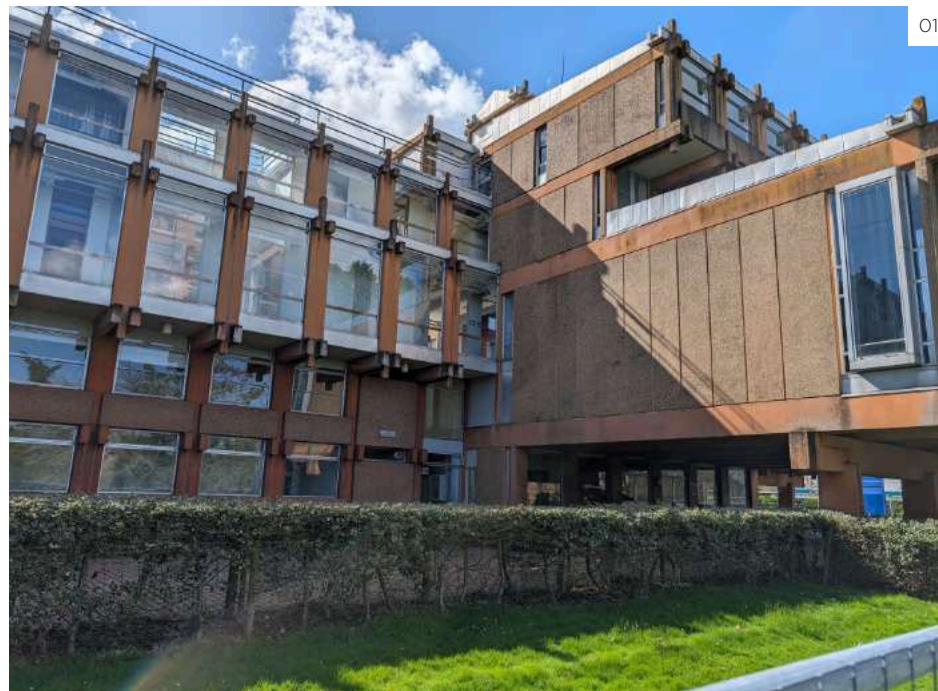
ADDITIONAL STAIR LOCATIONS

OVERVIEW

Due to the increase in building capacity, coupled with current fire escape requirements, an improved fire escape capacity is needed in the building.

Two out of three existing internal stairs will be upgraded with lobbies to improve their capacity. In addition, two new additional stairs are needed to comply with current fire escape regulations. They also provide opportunity to add new lifts to the building to improve accessibility.

In the following pages we explore alternative options.



- 01 North facade recess near main entrance.
- 02 South facade recess.
- 03 Internal lightwell.
- 04 East facade/elevation.

ADDITIONAL STAIR LOCATIONS

As explored above, there are several possible locations identified with varying 'pros and cons' to each. The design team have decided that Option 2 and 3 are the most viable and beneficial locations for the two new stairs.

STAIR CORE LOCATION OPTIONS

OPTION 1 - North Facade

- Pro: Feature staircase on a prominent facade.
- Pro: Clear access to all main floor levels, and can accommodate wide stair cases and accessible compliant lift sizes.
- Con: Obstructs public right of way and horizontal access of the undercroft.
- Con: Disrupts visual appearance of significant northern facade.

OPTION 2 - East Facade

- Pro: Considered the least sensitive elevation of the building.
- Pro: Can accommodate wide staircases and accessible compliant lifts sizes.
- Con: Does not access fourth floor.

OPTION 3 - South Facade

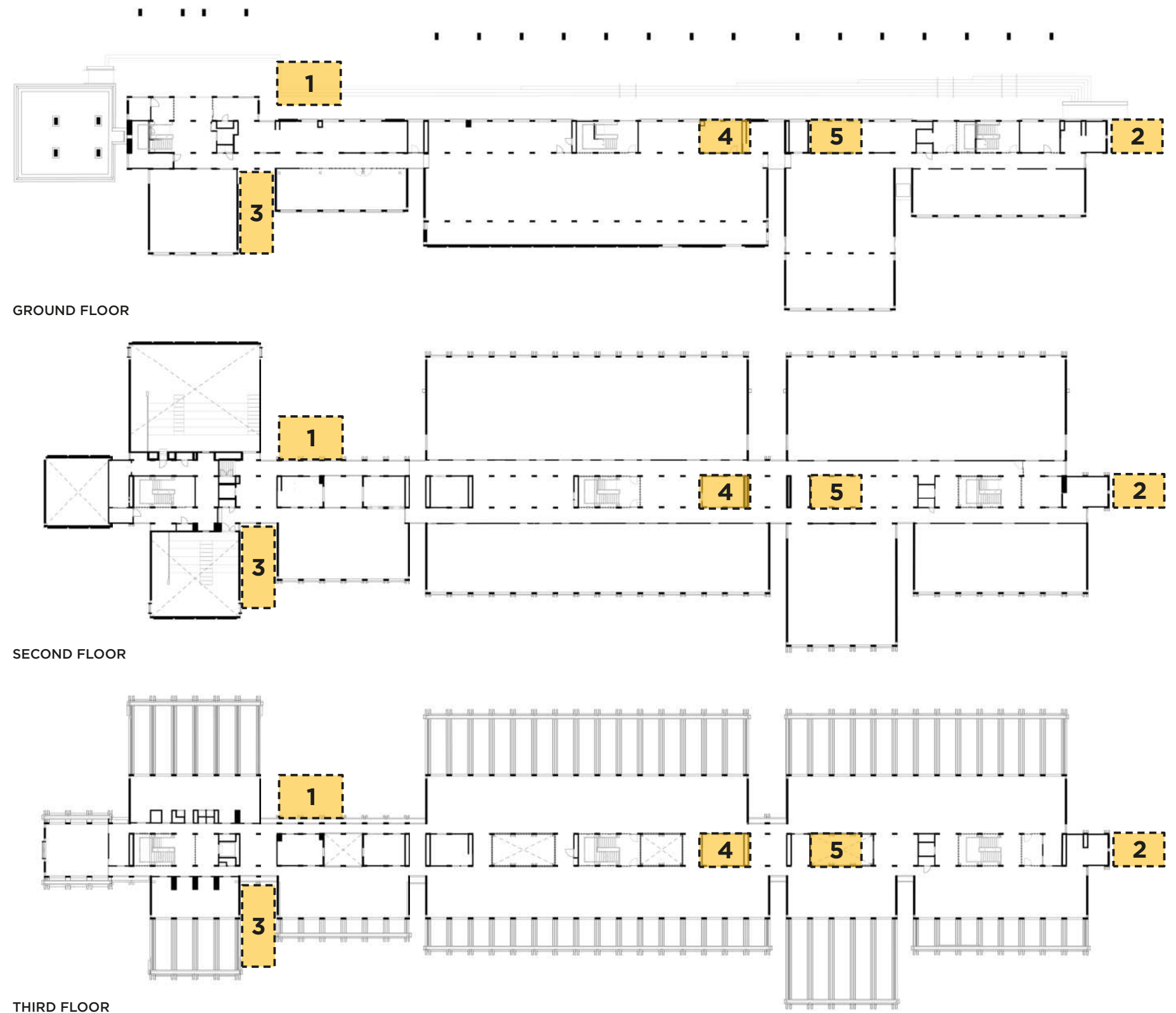
- Pro: Does not impede on any significant heritage sight lines.
- Pro: Clear access to all main floor levels.
- Pro: Ground level in this location has already been modified from original plan with a single storey extension.
- Con: Fills in one of the architectural recess break devices.

OPTION 4 - Internal Floor Slab

- Pro: Less external intervention.
- Con: Significant impact on existing concrete structure.
- Con: Does not access fourth floor.

OPTION 5 - Internal Light Well

- Pro: Less external intervention.
- Con: Disrupt significant internal heritage features, i.e. timber glazed screens.
- Con: Significant impact on existing concrete structure to lower levels.
- Con: Does not access fourth floor.



ADDITIONAL STAIR - FORM EVOLUTION

OVERVIEW

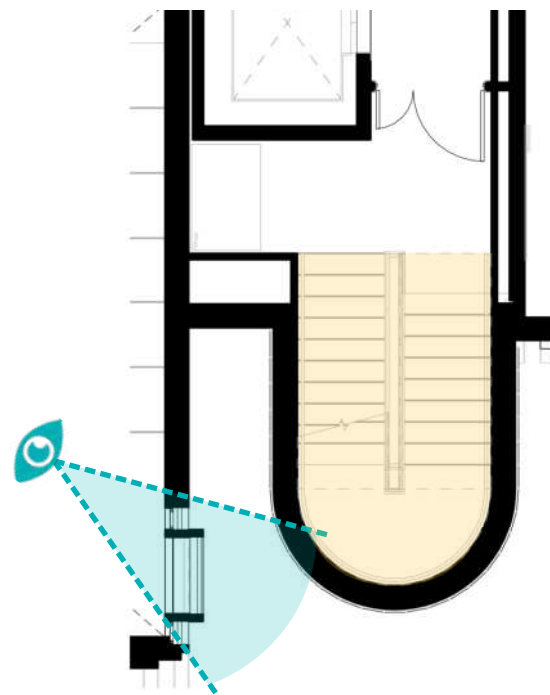
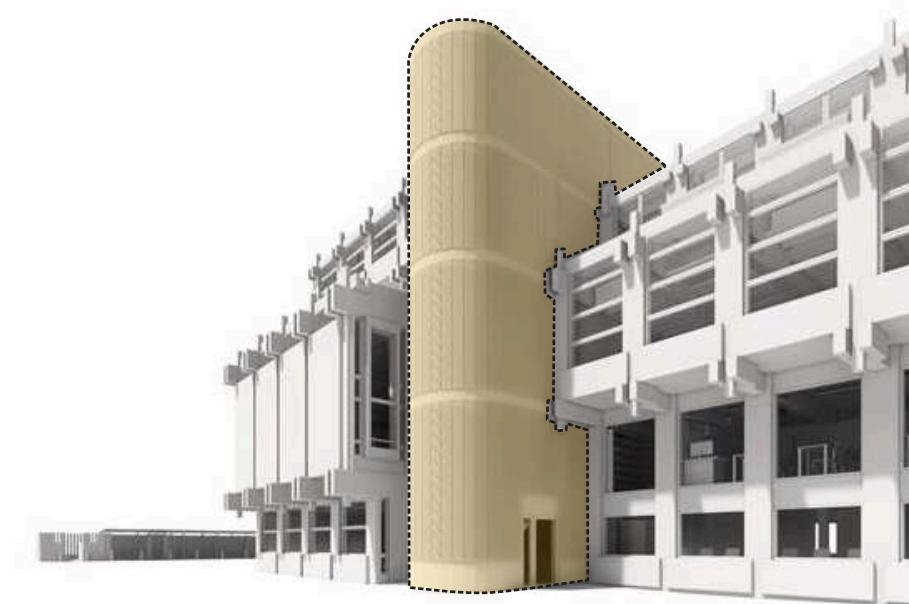
Both cores include a lift and fire escape stair. Alternative options were explored for the form of the stair cores. The south stair, being the more challenging location, was tested with both a curved and rectilinear design.

The following constraints were acknowledged during the design development process: the narrow available space; the location of existing footings below ground; and the existing Oriel window in the adjacent lecture theatre.

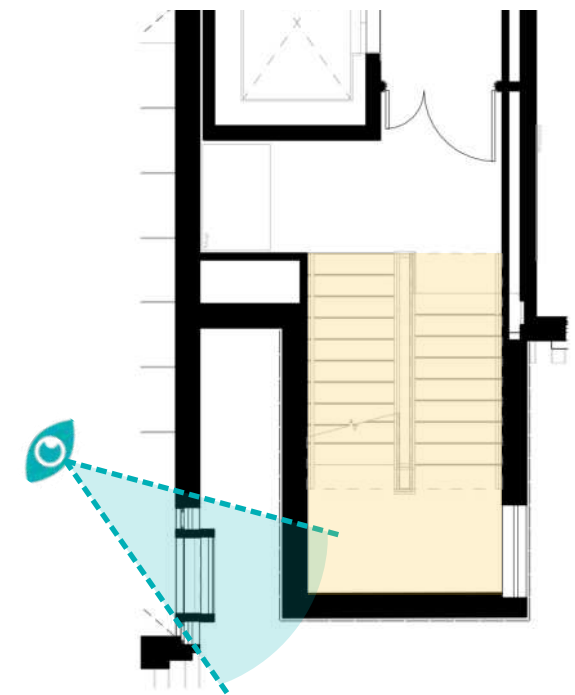
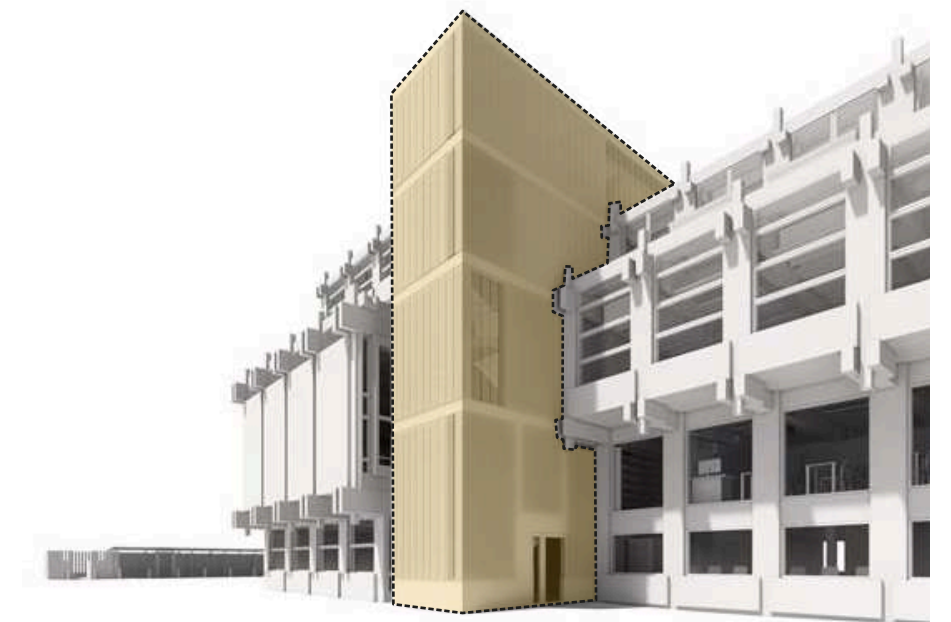
Following the pre-application feedback received from Wokingham Borough Council and Twentieth Century Society, the proposed external stair core options were reviewed against its impact on the existing building, in particular the impact on the Oriel window to the lecture theatre and the relationship with the existing building's architectural aesthetic. Collectively, the team has chosen to submit a curved stair design. Our reasoning for the selection of this option is because the curved form reduces the 'visual mass' of the extension and gives 'breathing space' to the Oriel window. It adds visual contrast to the existing building, creating a clear delineation between the two.

While the rectangular form may be considered more 'in keeping' with the architectural aesthetics of the existing design, characterised by rectilinear, orthogonal features, the rectangular form has significantly more impact on the Oriel window.

CURVED



RECTANGULAR



ADDITIONAL STAIR - ORIEL WINDOW IMPACT

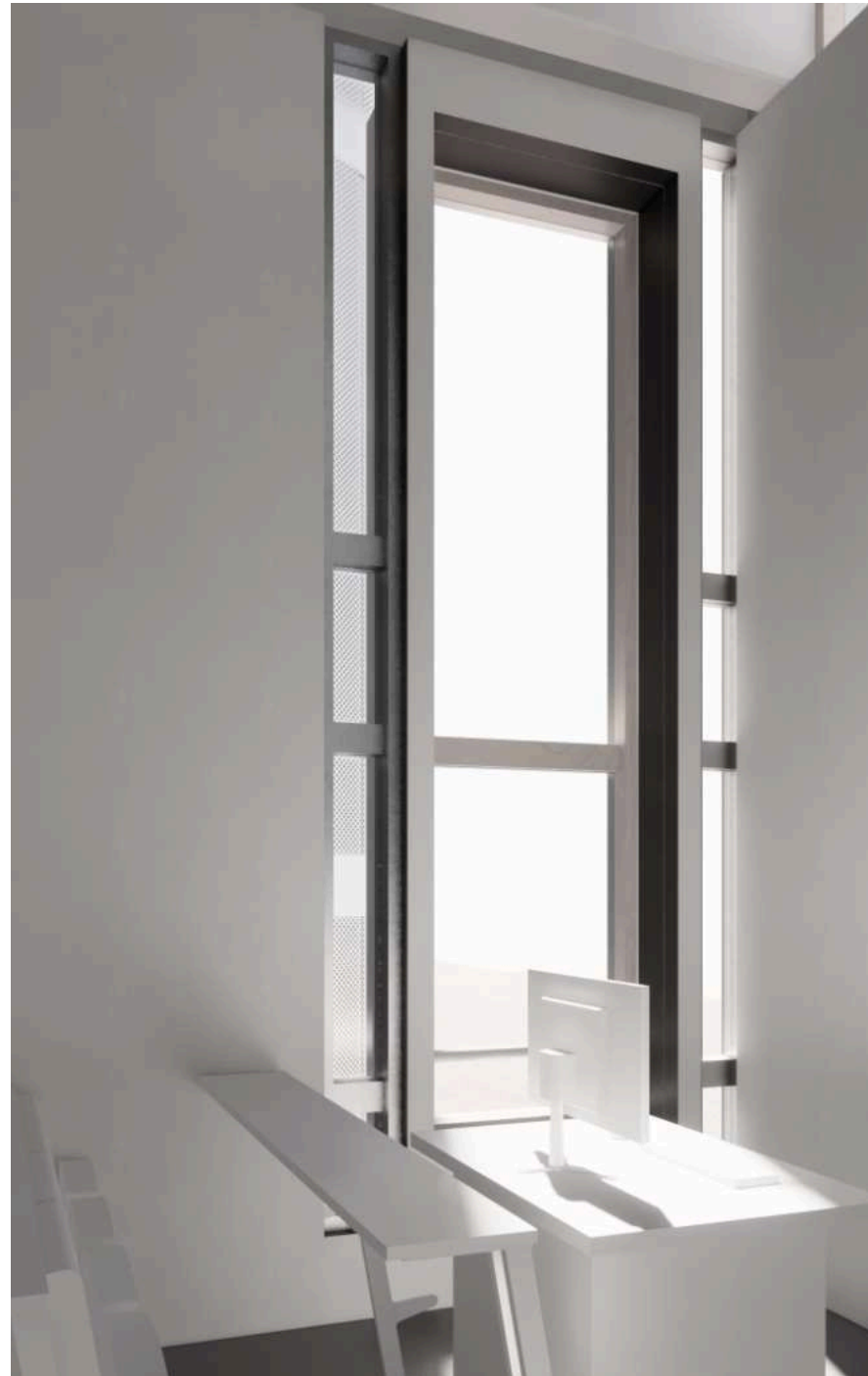
OVERVIEW

As well as the impact perceived externally by the new stair core on the Oriel window, we reviewed it's effect on the inside of the lecture theatre.

Our 3d studies reveal that the curved stair form, while still visible from within the lecture theatre, creates significantly less visual impact on the Oriel window than the rectangular version.

Both the view out and the amount of daylight in the space is improved with the curved stair core massing.

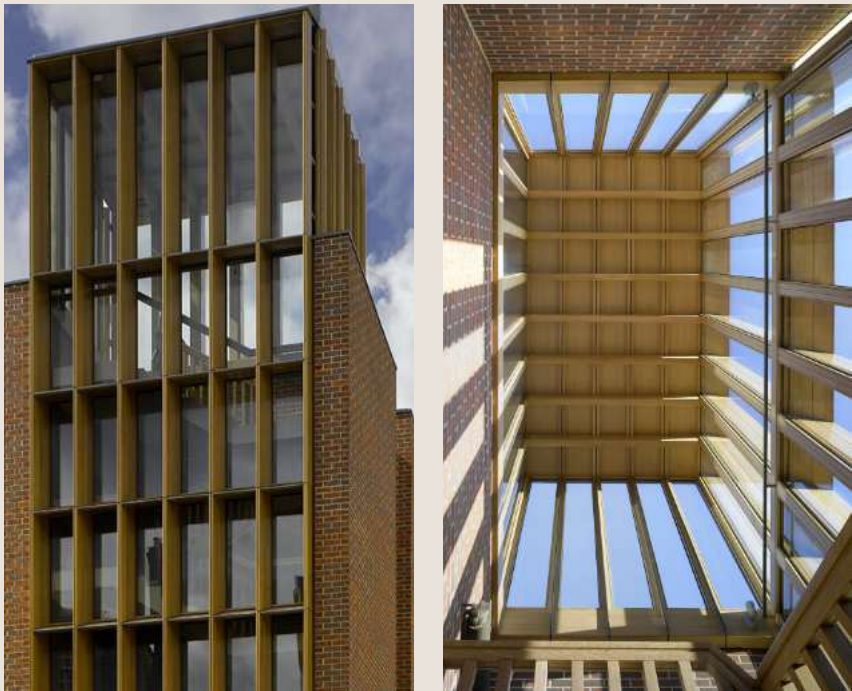
CURVED



RECTANGULAR



ADDITIONAL STAIR - MATERIAL EVOLUTION



TIMBER SLATS

Pros:

- Responds to the heritage significant internal timber glazed screens.

Cons:

- Timber fins would require significant maintenance used externally.
- Existing building does not use timber as an external material.
- Due to proximity to the existing envelope the escape stair must be protected in a fire resistant enclosure. Large areas of glass and timber close to existing windows will not be possible.



ALUMINIUM FINS & GLAZING

Pros:

- Responds to the existing exterior, textured, aluminium panels.
- Gives a more 'open' and 'lightweight' material impression.

Cons:

- Due to proximity to the existing envelope the escape stair must be protected in a fire resistant enclosure. Large areas of glass close to existing windows will not be possible.



PERFORATED ALUMINIUM

Pros:

- Responds to the existing exterior, textured, aluminium panels.
- Opportunity to add UoR and URS identity to design, through the perforated panel pattern.

Cons:

- Potential to be too 'solid' in appearance.

ADDITIONAL STAIR

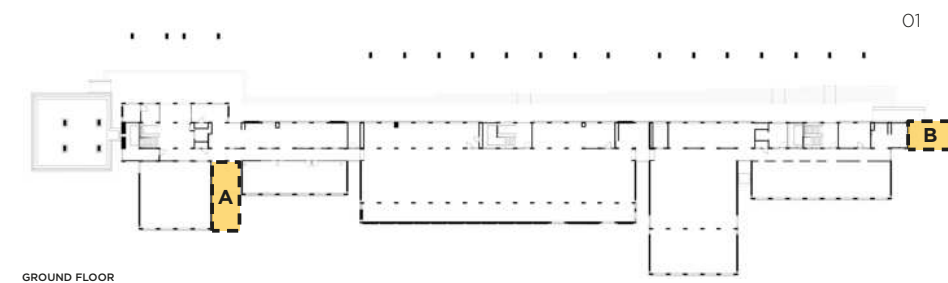
APPROACH

The stair proposed at the west end (stair A) will slot into an existing gap on the south facade of the building. The east stair (stair B) will 'hang off' the far end of the building, reading as an extension.

The curved form highlights the new addition to the building and, while it is not immediately in the same language as the existing building, it was felt that the introduction of a stand alone form as a stair core was a well known architectural device used at the time of this building by architects such as HKPA.

The proposed material choice for the stair cores will be perforated aluminium panels. The perforations respond to the existing 'textured' aluminium cladding, which is used across the building as a secondary material to the primary concrete elements. As seen with the existing textured aluminium, the perforations read as a solid material from a distance, which reveals detail on approach.

The banding of the new stair envelope will tie in with the existing floor levels.



- 01** Ground floor plan showing the proposed external stair core locations (nts).
02 Indicative view of new external stair core on the south facade.

ADDITIONAL STAIR

APPROACH

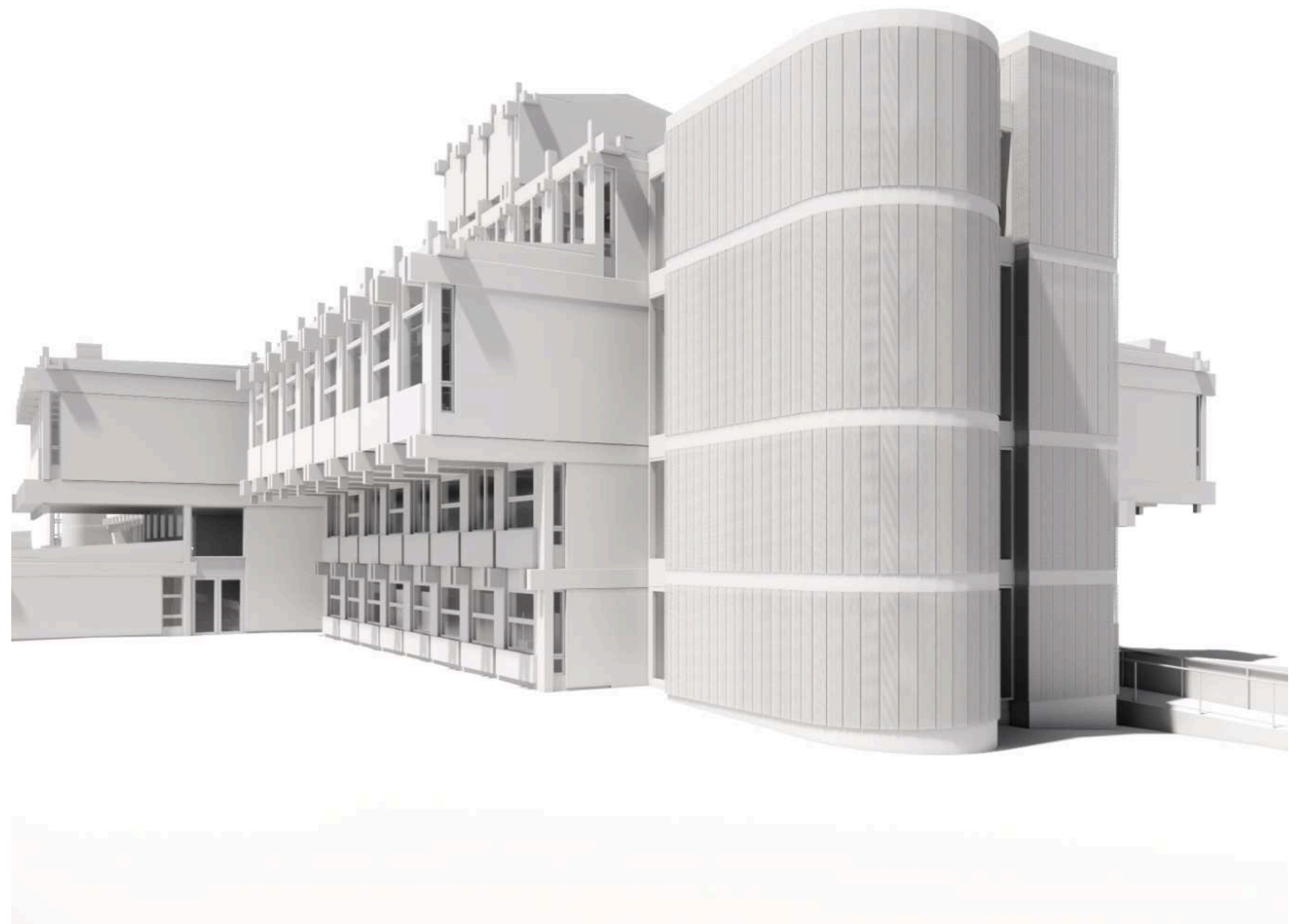
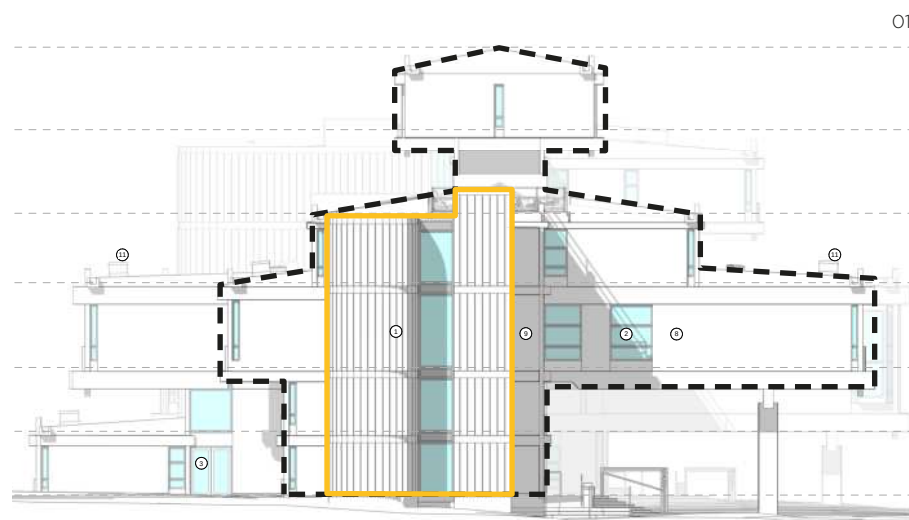
The second external stair core (on the east facade) will take the circular form of the west stair and develops a massing that is broken down into stair, lift and circulation elements.

Furthermore, efforts have been made to ensure the stair core will not disrupt the north facade, and generally keep within the existing building's profile. Recesses will be located between the URS building and proposed stair core to emulate those of the existing form, and to help it read as a separate extension.

The banding of the new stair envelope will tie in with the existing floor levels.

External escape doors will be located on both the north and south facade, with a new pathway formed away from the building.

To give emphasis to the existing horizontal circulation spine, and promote views and transparency through the centre of the floorplate, a vertical glazing strip will be positioned at the end of the east stair core.



01 Annotated east elevation showing the relationship between the existing building's profile with the proposed east stair core (nts).

02 Indicative view of new external stair core on the east facade.

ADDITIONAL STAIR PROPOSED PANEL PATTERN

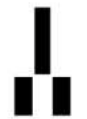
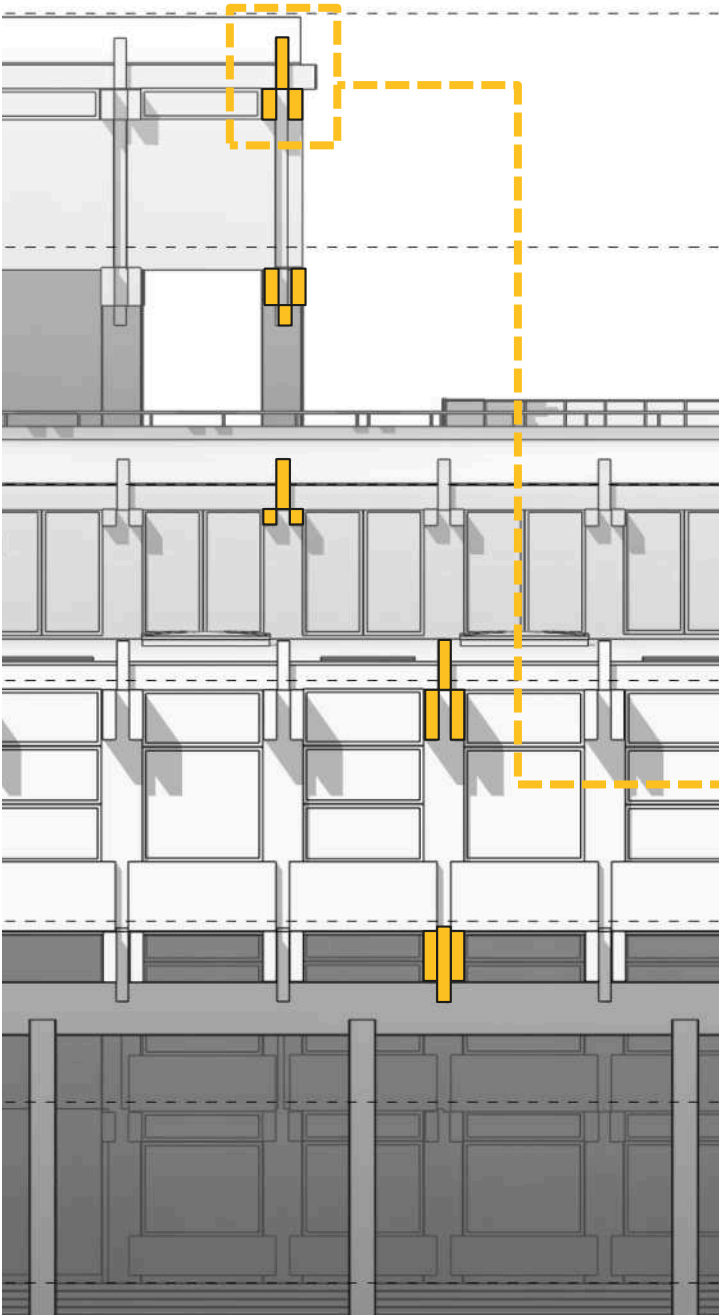
APPROACH

The aluminium cladding will be textured using perforations to create a light and shade effect.

We have looked at an abstract pattern to create an overall texture based on the existing building's structural beam endings.

This motif would be used across the new cladding areas but could also be used on signage, graphics and interior design features.

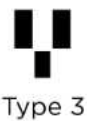
The proposal is intended to be a subtle abstract texture reflecting the building's identity rather than a pictorial representation.



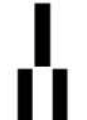
Type 1



Type 2



Type 3



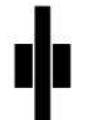
Type 4



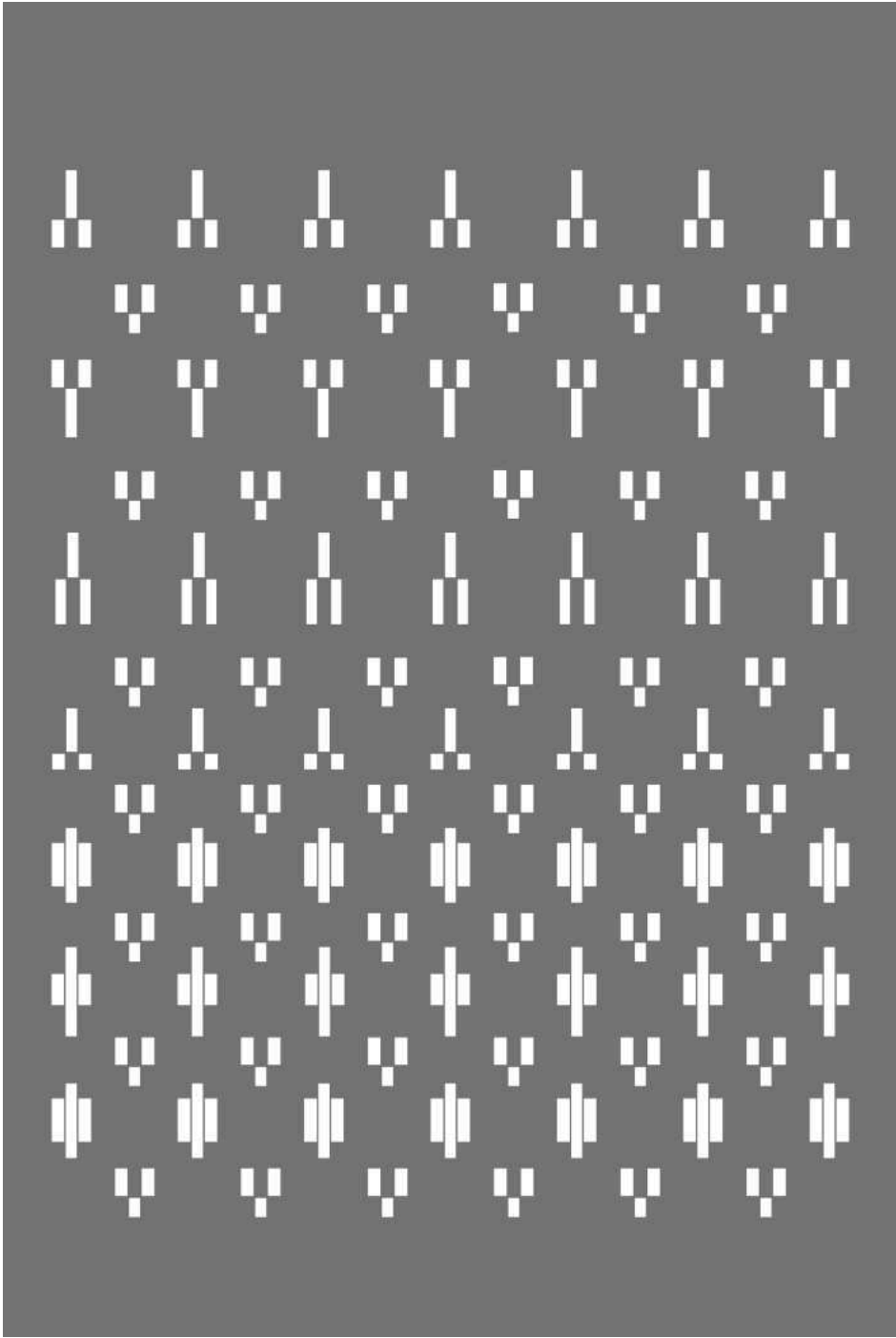
Type 5



Type 6



Type 7



01 Photo of existing building, showing various structural beam end sizes.

02 Series of images showing progression of panel pattern concept.

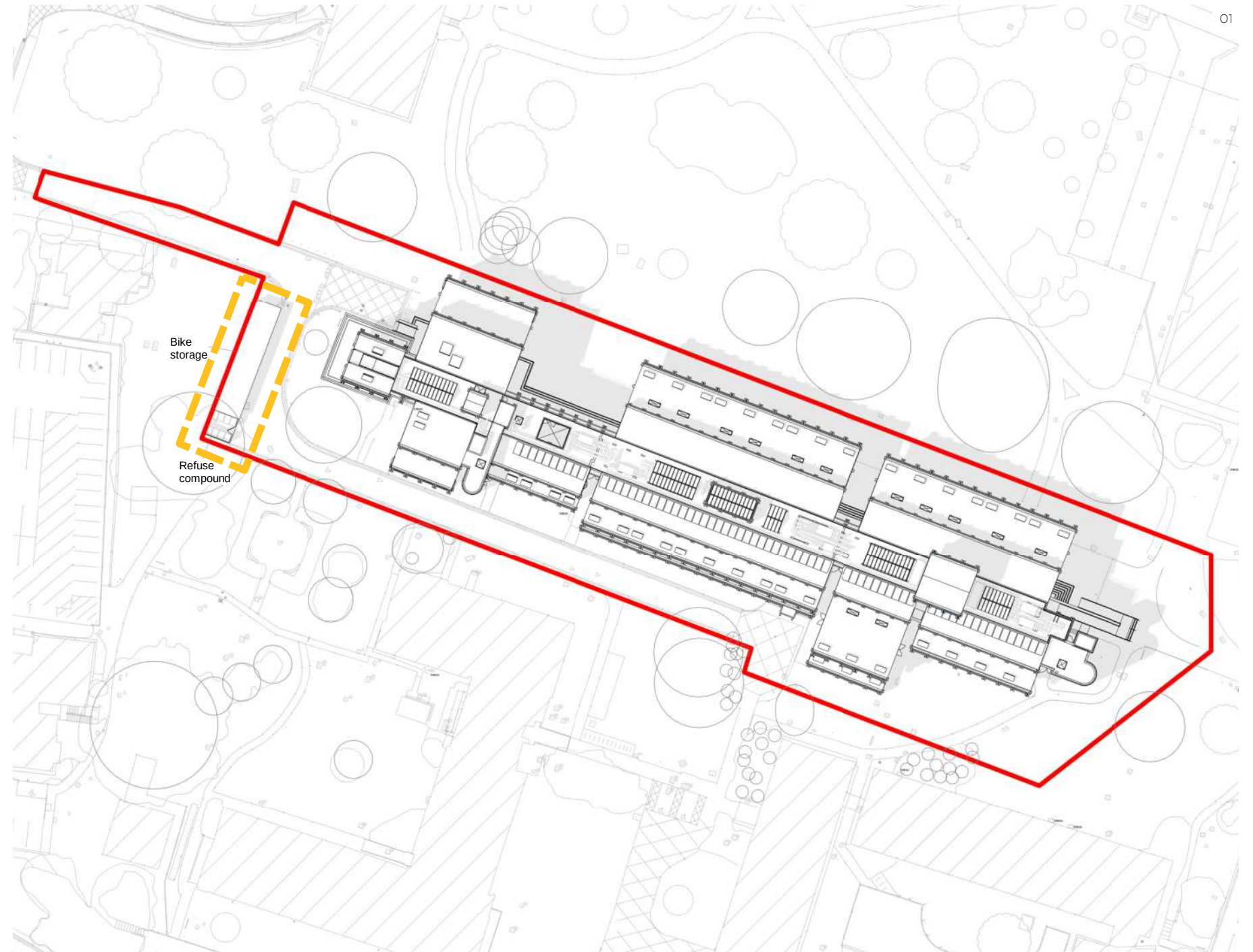
LANDSCAPE

OVERVIEW

While large scale external landscape works are not envisaged, refurbishment of the undercroft paving areas is proposed. This includes the following: improvement to wayfinding, promotion of the secondary entrance, improved accessibility, and increased slip resistance.

There will also be small-scale vegetation changes and enhancements made, which are detailed in the following pages.

A bike and bin store is proposed at the west of the building, and is further explained in the following pages.

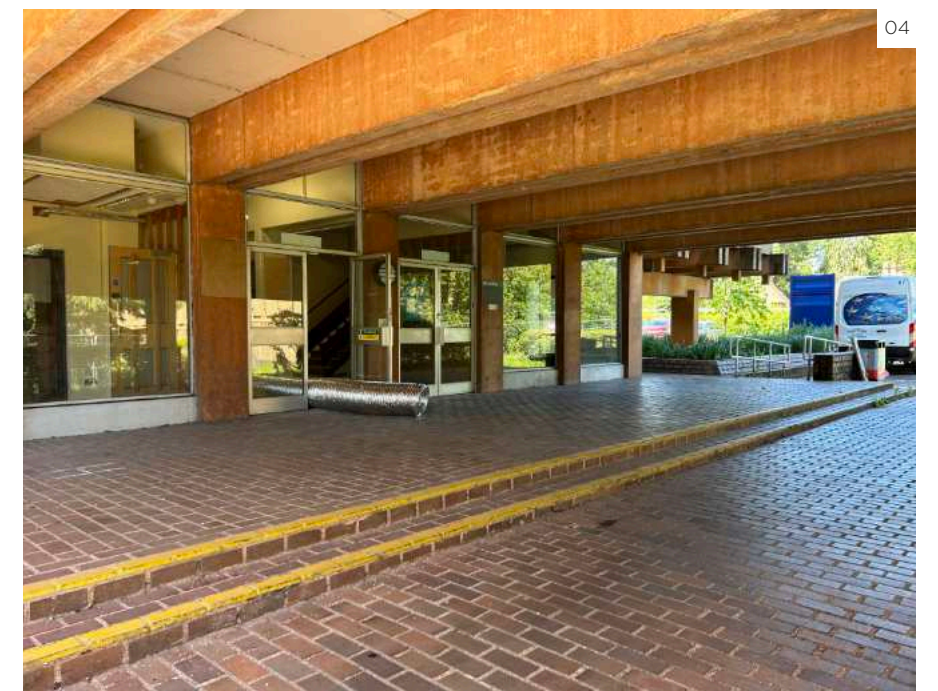


01 Site plan highlighting proposed bin and bike storage location in yellow (nts).

LANDSCAPE - PAVING AND UNDERCROFT

EXISTING

- Broken paving tiles (Figure 02) along undercroft and around the pond.
- Slippery conditions, when raining.
- Worn yellow on stair nosing, which also does not provide any extra grip in wet conditions.
- The existing ramp to the west is approximately 1:15 and the east ramp is 1:8.



- 01 Photo of existing east entrance.
- 02 Photo of existing paving damage.
- 03 Photo of existing paving near the main entrance and pond.
- 04 Photo of existing main entrance (during asbestos removal works).

LANDSCAPE - PAVING AND UNDERCROFT

PROPOSED

- Paving will be steam cleaned and re-grouted.
- The surfaces will be treated with a clear coating to help improve anti-slip, but that does not alter the colour of the original tile.
- To improve grip and step visibility we will be removing the existing paving along the stair nosing and replacing with an 'Anthracite Black Quarry' step tread. These tiles should be a direct replacement for the red quarry tiles, which will improve visual contrast and are ribbed for safety.
- Width = 215mm / Height = 102mm / Thickness = 15mm of proposed 'Anthracite Black Quarry' step tread tile.
- The existing tiles removed from the step nosings will be used to repair and replace broken/damaged paving tiles in other areas of the undercroft and the pond perimeter wall.



01



02

01 Precedent image of Anthracite Black Quarry step tread tiles.

02 Indicative view of proposed paving nosing.

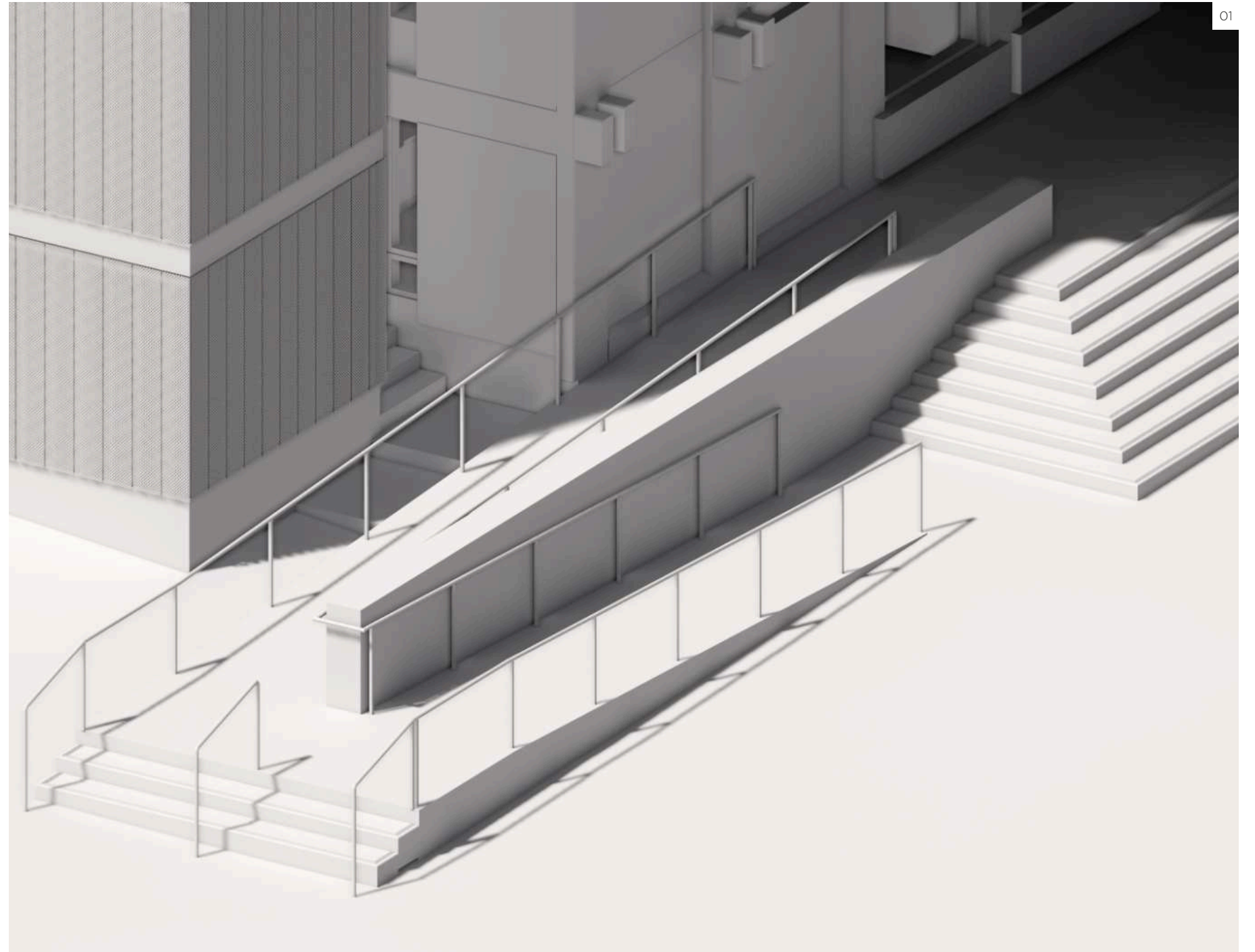
LANDSCAPE - ACCESS

OVERVIEW

The ramp to the east of the building is inadequate in gradient, therefore it will need to be remodelled to meet the current gradient regulations. This will be accomplished by using new brick pavers, similar in appearance to the existing, to rebuild the ramp to an appropriate gradient and length.

The fin wall will remain in the same location, but will be extended in line with the footprint of the new access ramp.

However, the western ramp has a sufficient gradient, so will only be refurbished with new handrails.



01 Indicative image of the proposed eastern ramp.

LANDSCAPE - VEGETATION

OVERVIEW

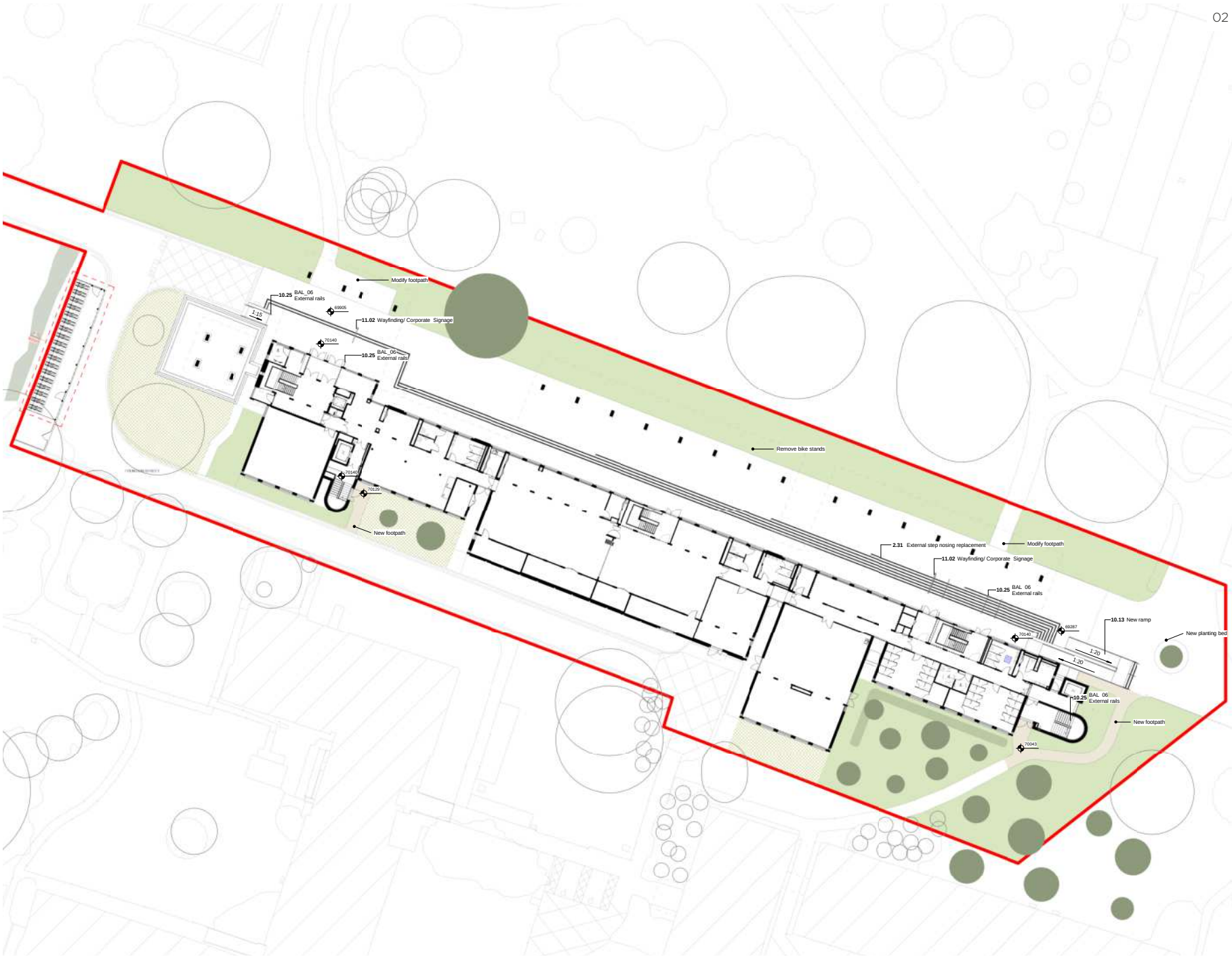
Our proposals include the removal of the hedge along Chancellor's Way. The hedge is not an original feature and distracts from the original intention of the building sited on the edge of a mature landscape. This will give greater visibility and flow into the building's undercroft spaces.

To mitigate the loss of planting on the site, the intention is to replace the hedge with more 'species rich', native hedging elsewhere on the campus. In addition, areas of tree and shrub planting will be introduced to the south east corner of the building. Further, a large single specimen tree will be added to the recess on the northern side, which was designed in response to a large tree that was lost some time after the building was completed.

Please see the Tree Survey, Arboriculture Impact Assessment and Arboriculture Method Statement produced by Challice Consulting Ltd alongside the Biodiversity Net Gain technical note from EPR for further landscape details.



01



02

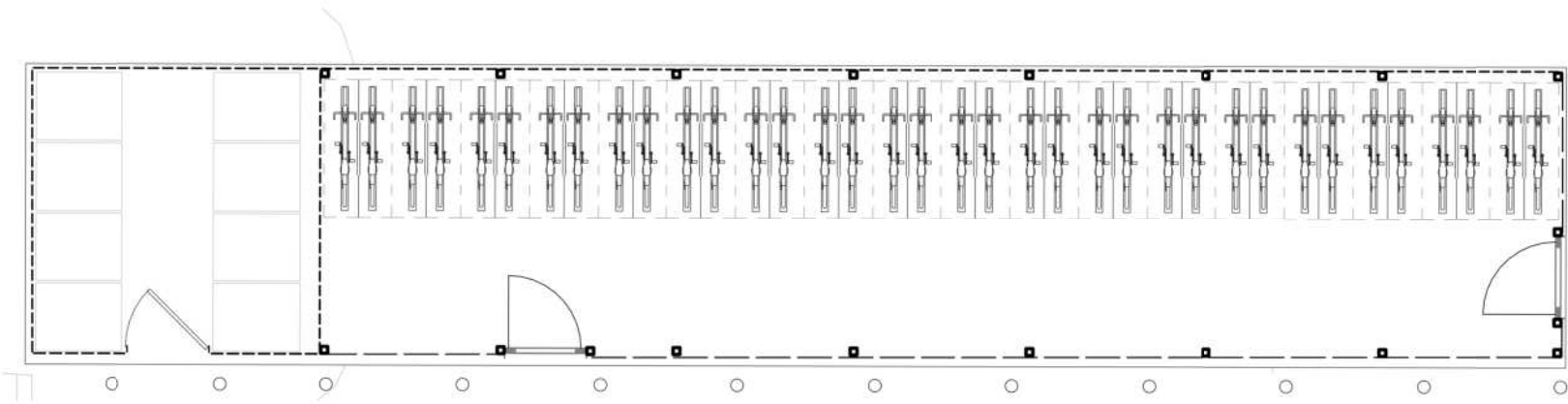
01 Image of original building and undercroft, without the hedge along Chancellor's Way, taken from the November 1973 issue of the Architectural Review magazine.

02 Site plan highlighting proposed vegetation strategy (nts) (please refer to drawing sheet number 18310 for site plan key).

BIN & BIKE STORE

PROPOSED

- Existing space consists of approximately 10 vehicle parking spaces.
- Steel post structure with laminated glass and timber slat facade.
- Laminated glass at exposed sides of shelter for safety and security reasons, and timber slats around the back of the bike shelter and bin store.
- Structure stands at approximately 2500mm high.
- Overall footprint approximately 107m².
- Capacity for 8 euro-bins and 36 bikes on Sheffield stands.
- The existing building has no dedicated waste storage collection area, with bins often left on the road. Our BREAAAM assessment needs a dedicated and secure bin area. The chosen location is close to the neighbouring building's bin space.



- 01 Photo of existing area with 10 vehicle parking spaces.
- 02 Elevations of proposed bin and bike store (nts).
- 03 Floor plan of proposed bin and bike store (nts).

07

INTERIOR

AYRE
CHAMBERLAIN
GAUNT

INTERIOR OVERVIEW

OVERVIEW

The original interior design intention of URS included expressing / revealing the structure and materials (as seen in the original Architectural Review (1973) image to the right).

In subsequent years, the building has had interior alterations and later additions, including painted concrete beams/columns, painted blockwork walls and stair core balustrades, floor plan reconfiguration and addition of partitions.

The proposed interior design approach attempts to be sympathetic to it's heritage, by respecting and enhancing the original design principles, including exposed structure and materials; and complementing this, where possible, with new sustainable additions.



01 Photo of original URS first floor corridor, taken from the November 1973 edition of the Architectural Review.

EXISTING MATERIAL PALETTE

The scheme looks to retain, refurbish and enhance many existing materials in the URS Building. In some cases, existing materials will be replaced with similar approaches in more sustainable materials.



PAINTED CONCRETE

Exposed concrete in certain areas has been painted white or magnolia to match partitions. Where possible, these will be painted white or treated with a finish that is respectful of the original finish.



TIMBER GLAZED SCREENS

Refurbish wood varnish to lighten wood colour.



MAGNOLIA & WHITE PAINTED WALLS

All existing painted walls will receive new neutral finishes, in keeping with modern educational facilities.



WOODWOOL & TIMBER ACOUSTIC PANELS

The existing acoustic cladding (woodwool and timber slats) in the lecture theatres will be replaced with a higher acoustic performance and sustainable equivalent that is similar in scale and section size to the original.



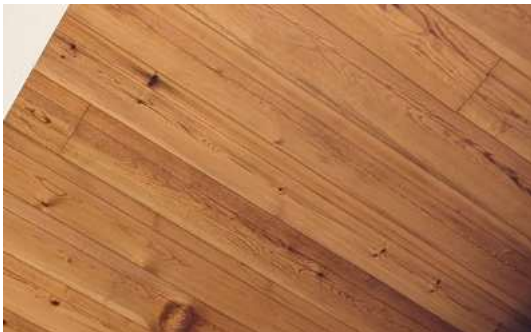
WHITE PAINTED BLOCKWORK

Exterior walls will require new insulation over the existing blockwork and classroom wall linings will require acoustic plasterboard linings. Other areas of exposed blockwork will be plastered over for visual continuity, after door openings will be expanded to accommodate new accessible door sizes.



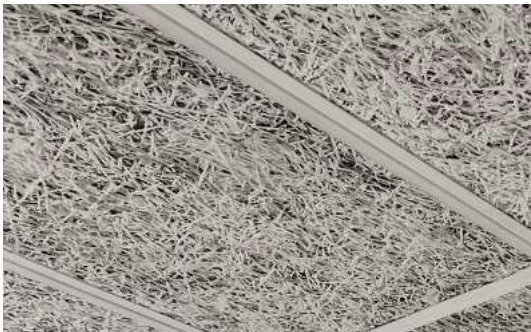
CONCRETE STAIR CORES

Existing stairs were precast with inlaid nosing, which will be refurbished.



TIMBER CEILING PANELLING

Although specific areas of timber ceilings will be removed, the proposal includes timber and woodwool elsewhere in the building.



WOODWOOL CEILING SLABS

The existing woodwool ceilings will be removed and replaced with new neutral woodwool baffles, to facilitate acoustic requirements.

NEW MATERIAL PALETTE



MICROCEMENT FLOORING

Neutral toned microcement flooring to be installed in significant areas like foyers/lobbies.



CARPET FLOORING

Dark toned carpet to contrast circulation spaces and selected due to sensitivity for those who are neurodivergent.



TIMBER WINDOW FRAMES

Timber composite window finish to reveal wooden frame.



ACOUSTIC PANELS & BAFFLES

Neutral woodwool acoustic baffles and rafts will mask services equipment and provide acoustic attenuation, while picking up on the original woodwool roof deck materiality.



PAINTED & PLASTERED WALLS

Existing blockwork walls will be plastered and painted, to maintain high quality finishes, as in many areas blockwork will be altered to increase door opening widths or infilled to block up openings not needed.



NON-SLIP VINYL FLOOR

Non-slip, durable vinyl flooring will be used in washrooms, kitchenettes and other areas where durability is key.



LIGHT OAK

Light oak timber proposed for furniture and internal door finishes.



BRUSHED STAINLESS STEEL

Stainless steel lever handles and ironmongery are contemporary in design to original cylinder handles of the period while being DDA compliant.

KEY SPACES

OVERVIEW

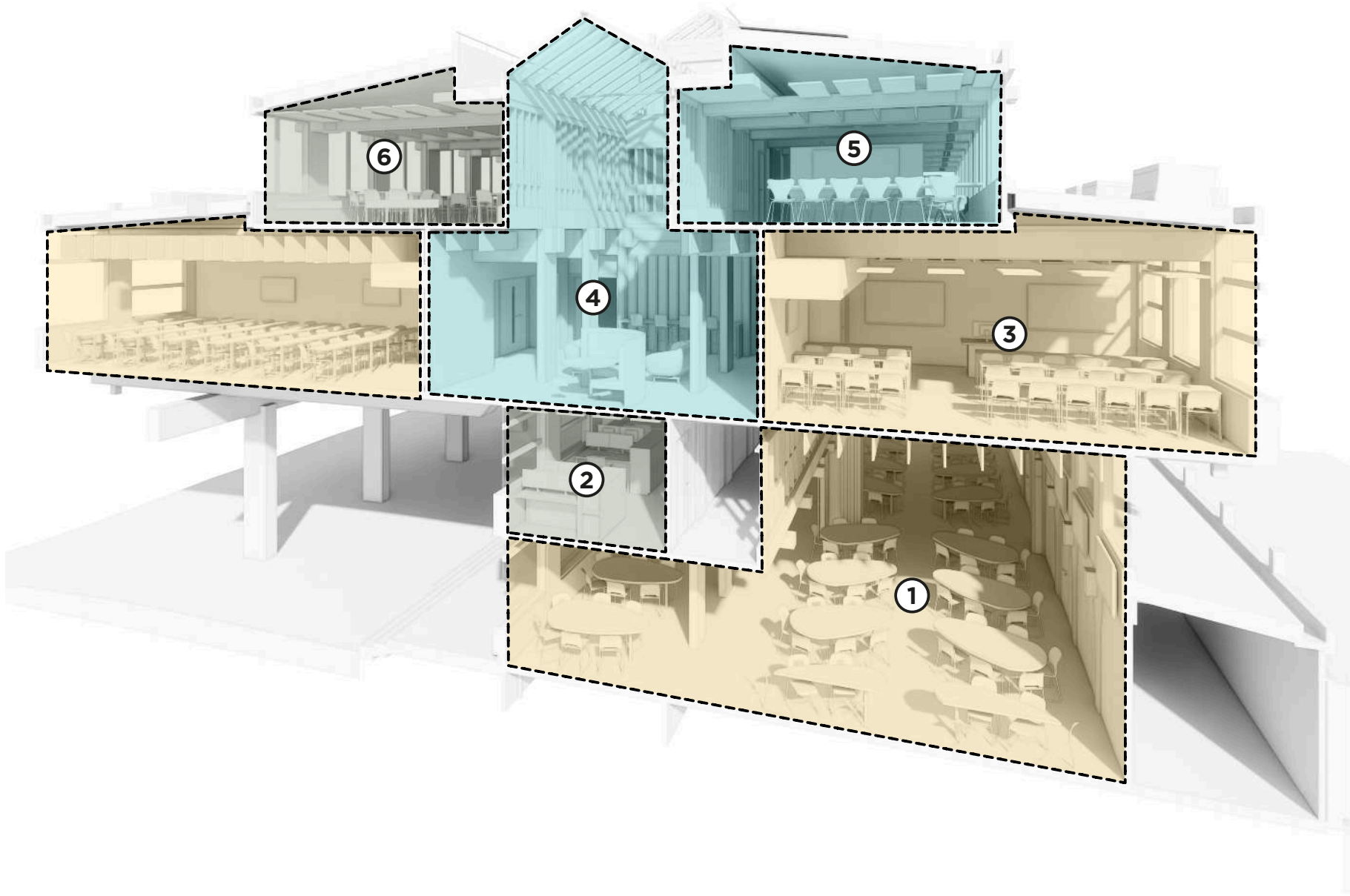
The following pages illustrate the interior design strategy for many of the key and ancillary spaces in the building. This section includes an overview, look & feel and material & furniture palette for each space.

Selection of Key Spaces:

- 1. Interactive Teaching Space
- 2. CME Offices
- 3. General Teaching Classrooms
- 4. Social Study
- 5. CME Heart (Social Study)
- 6. CME Heart (Resource Room)



01

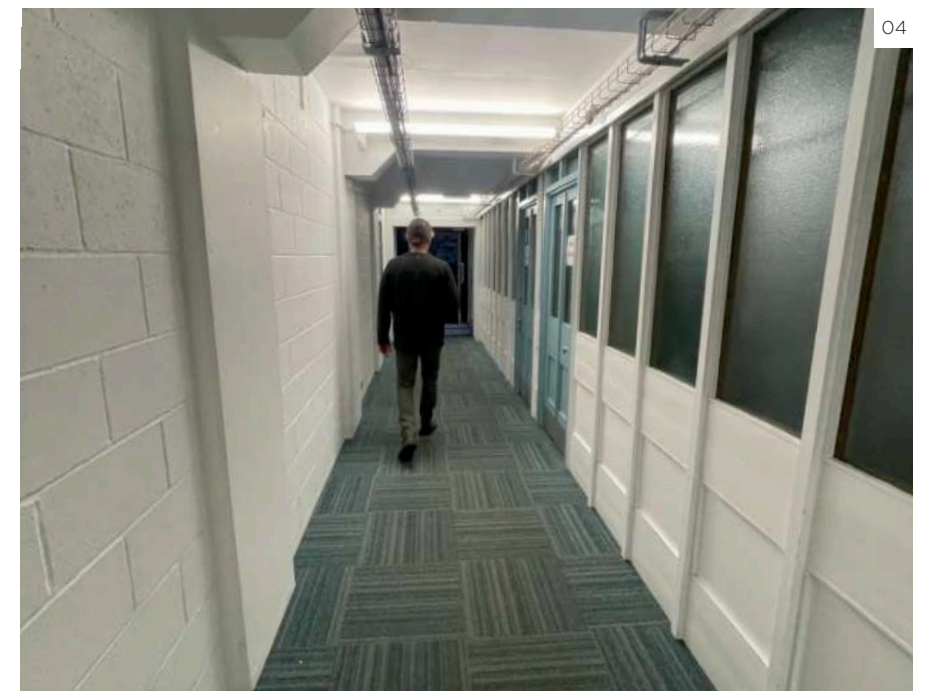


01 Indicative visual of second floor social study space (key space 4).
02 Sectional perspective with a selection of key spaces annotated.

ENTRANCE FOYER

EXISTING

- No clear URS entrance identity.
- Conflicting, mix-matched finishes and fittings.
- No dedicated student study/social area.
- Later addition timber screens and floor plate, not from the original 1970s design and construction.
- Painted concrete beams and columns.



- 01 Photo of existing main entrance foyer.
- 02 Photo of existing main entrance foyer.
- 03 Photo of existing ground floor space connected to the entrance foyer.
- 04 Photo of existing circulation by main entrance foyer.

ENTRANCE FOYER

PROPOSED

The entrance foyer will focus on the use of natural, sustainable materials to complement the existing timber glazed screens and concrete structure. The proposal includes timber clad wall panels with feature lighting, echoing the vertical repeated elements in the interior of the building and highlighting/emphasising the main entrance.

The exposed beams, columns and soffit will be repainted and the stair well opened out at ground floor with the removal of some walls. The flooring will be replaced with a hardwearing fine concrete finish.

Social study areas will contain a mix of sofa-style seating and laptop perches. The intention behind this space is to be a more relaxed and noisier space, in comparison to the study spaces located on upper floors of the building.



01 Indicative visual of the proposed entrance foyer on the ground floor.

ENTRANCE FOYER

EXISTING



PROPOSED MATERIALS & FINISHES



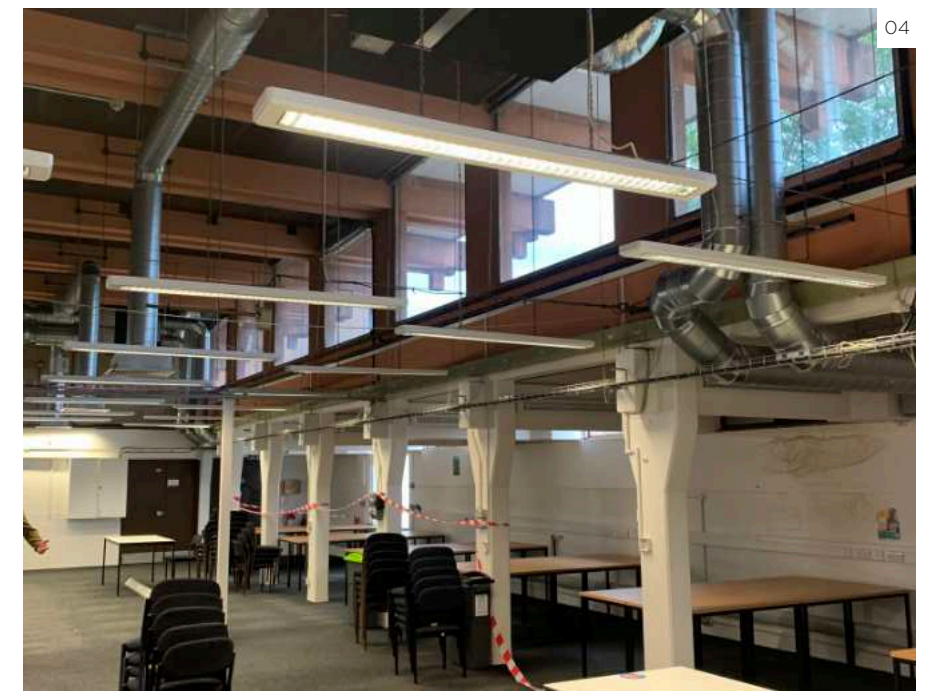
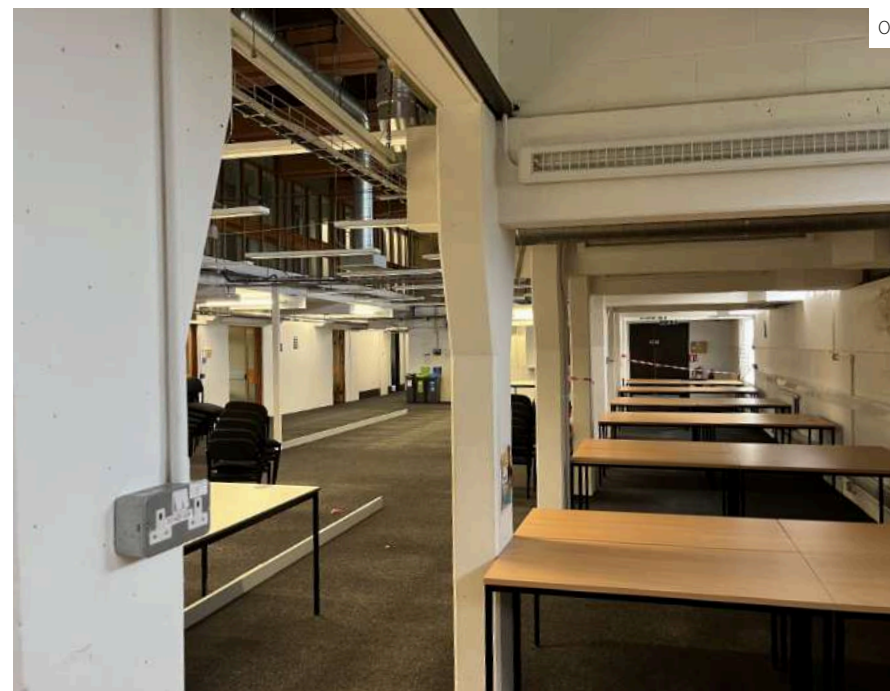
PROPOSED FURNITURE & FIXTURES



DOUBLE HEIGHT 'PRINT ROOM'

EXISTING

- Exposed plant/M&E pipework.
- Exposed, hanging lighting equipment.
- Timber glazed screens along first floor facade, looking down in to space.
- Both single storey and double height ceiling levels.
- Existing small enclosed space under single-storey area.
- Painted concrete beams and columns.



01 Photo of existing double height 'print room' space.

02 Photo of existing M&E pipes running through the 'print room' space.

03 Photo of existing single storey area in the 'print room' space.

04 Photo of existing double height 'print room' space.

DOUBLE HEIGHT 'PRINT ROOM'

PROPOSED - INTERACTIVE TEACHING SPACE

Woodwool acoustic baffles will be suspended between the exposed beams' allowing the structure to be clearly read. Mechanical plant is limited to the lower single storey area, supplying air through low level ductwork below the high level windows.

The first floor timber and glass screen above the double volume space will be retained and refurbished with new clear glass, replacing the existing Georgian wire glass. Some of the timber screens to ground floor are removed to make an open usable space, however the timber screens to the central stairwell remain.

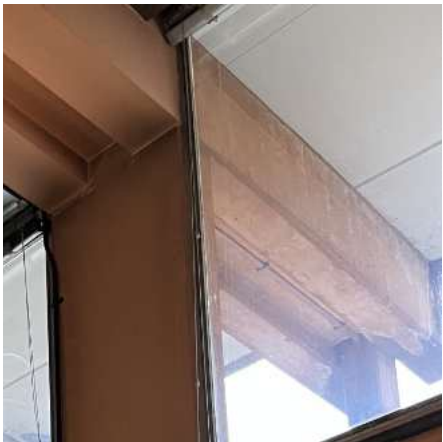
The furniture will seek to promote interactive group learning with the use of 'plectrum' style tables and plenty of visible AV screens.



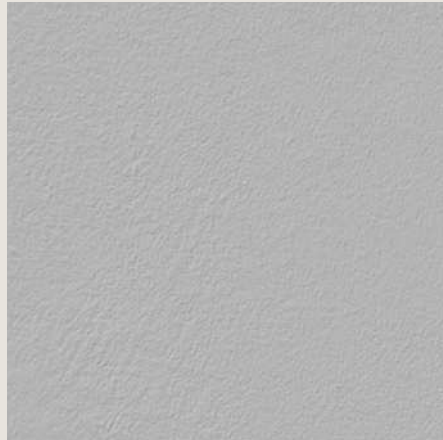
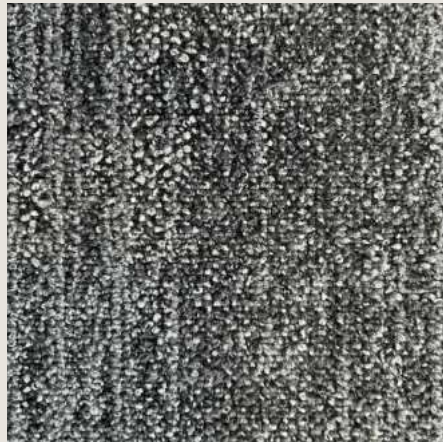
01 Indicative visual of the proposed general teaching workshop space on the ground floor.

INTERACTIVE TEACHING SPACES

EXISTING



PROPOSED MATERIALS & FINISHES



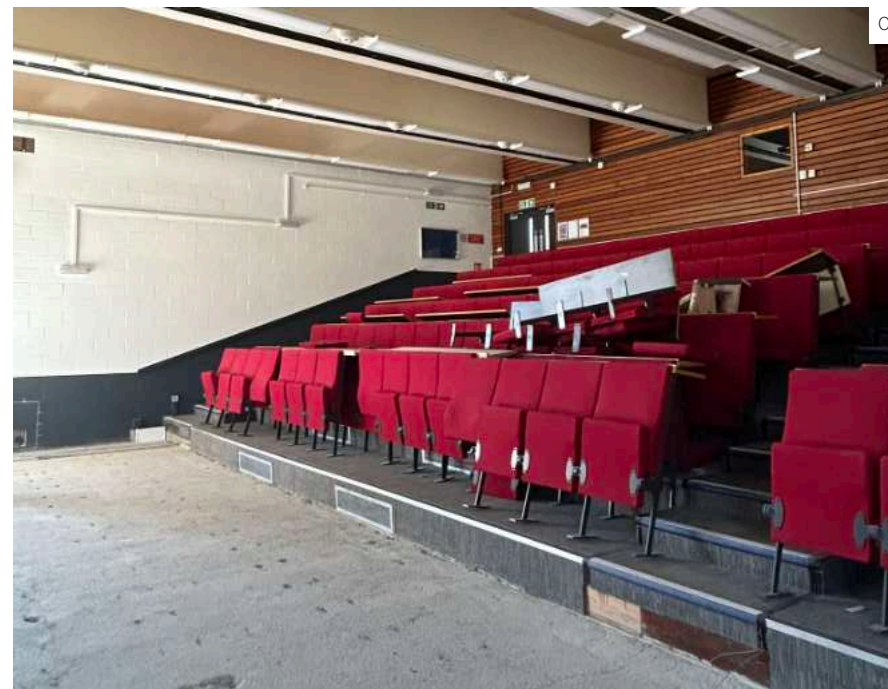
PROPOSED FURNITURE & FIXTURES



LECTURE THEATRES

EXISTING

- 2 x Lecture Theatres, with seat capacities of 185 and 92.
- Oriel windows on either side of both spaces.
- Limited disabled provision on second floor level (top of rake seating).
- Painted concrete beams.
- M&E equipment hidden within the centre of the concrete beams and below rake seating, feeding up to fourth floor plant room.
- Timber and woodwool lined wall at rear of lecture theatre and ceiling, for acoustic absorption benefit.



01 Photo of existing 92 seater lecture theatre.

02 Photo of existing 92 seater lecture theatre.

03 Photo of existing 185 seater lecture theatre after asbestos removal works.

04 Photo of existing 185 seater lecture theatre.

LECTURE THEATRES

PROPOSED

Woodwool acoustic baffles will be suspended between the exposed beams' allowing the structure to be clearly read. Air is supplied from the level 4 plant rooms to supply grilles below the raked seating, extracted at high level.

Timber acoustic panelling will highlight the front and rear walls. Linear rows of tiered seating facing towards the teaching wall and oriel windows, will be replaced with new durable finishes.



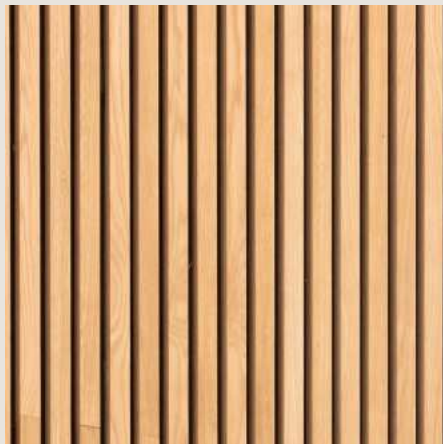
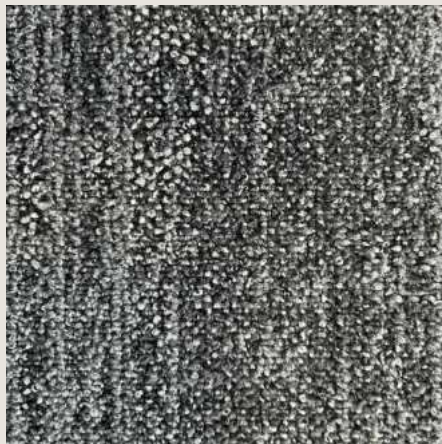
04 Indicative visual of the proposed large lecture theatre.

LECTURE THEATRES

EXISTING



PROPOSED MATERIALS & FINISHES



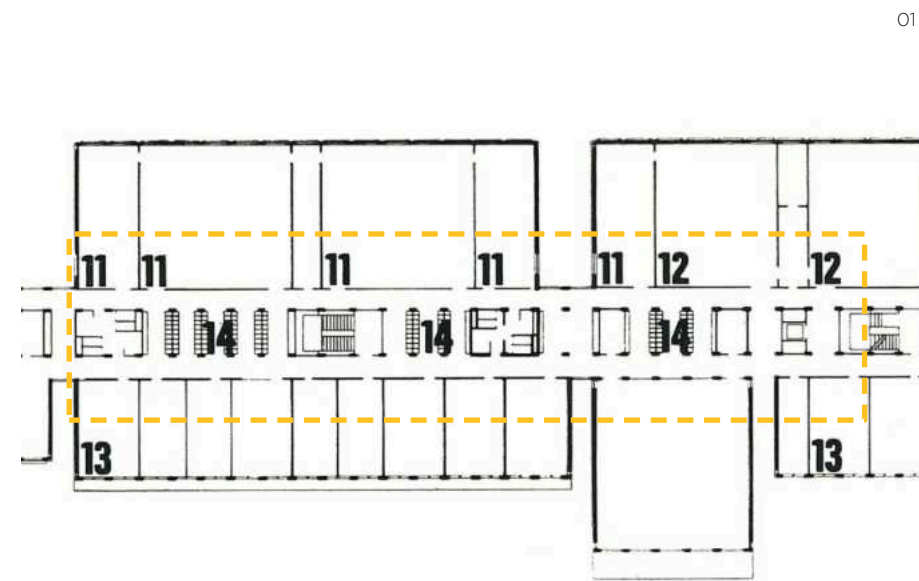
PROPOSED FURNITURE & FIXTURES



SECOND FLOOR CIRCULATION/LIGHTWELLS

EXISTING

- Substandard lightwell enclosures and multiple M&E distribution equipment hung from the ceiling on second floor.
- One example has a ceiling blocking the lightwell off, another includes a partial enclosed space.
- Original drawings indicate it was originally open circulation space with free-standing lockers.
- Studying the timber screens, it can be seen that the clerestory screens at second floor are a different design and coupled with the lower infill being light weight stud partition - it is assumed these enclosures are a later addition.



01 Original second floor plan, highlighting the original open circulation space.

02 Existing lightwell with substandard interventions, adjacent to main circulation route.

03 Existing lightwell from third floor, showing the addition of a ceiling and air-con unit.

04 Existing horizontal M&E distribution along second floor ceiling.

05 Existing lightwell from second floor, showing the addition of a ceiling and air-con unit.

SECOND FLOOR CIRCULATION/LIGHTWELLS

PROPOSED - SOCIAL STUDY

The social study spaces placed along the second floor provide vital break out space to proposed classrooms on this level. Opening them up by removing the later added partitions, will provide light and views up to the third floor timber screens. These timber screens will be refurbished with new clear glass improving fire performance and visibility.

The roof lanterns will be replaced with triple glazed units, with a portion opening for ventilation and smoke clearance.

Furniture will be a mixture of sofas, booths, group work tables and chairs as well as individual study spaces.

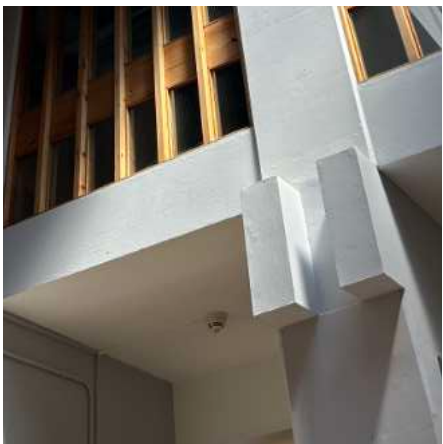
The twin circulation routes either side will be left clear to express the axial nature of the building and will be differentiated by flooring finish.



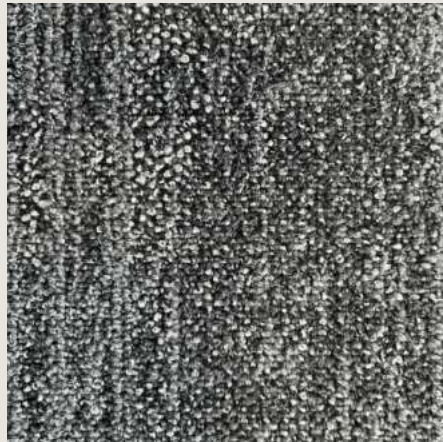
01 Indicative visual of the proposed social study space on the second floor.

SECOND FLOOR CIRCULATION/LIGHTWELLS

EXISTING



PROPOSED MATERIALS & FINISHES



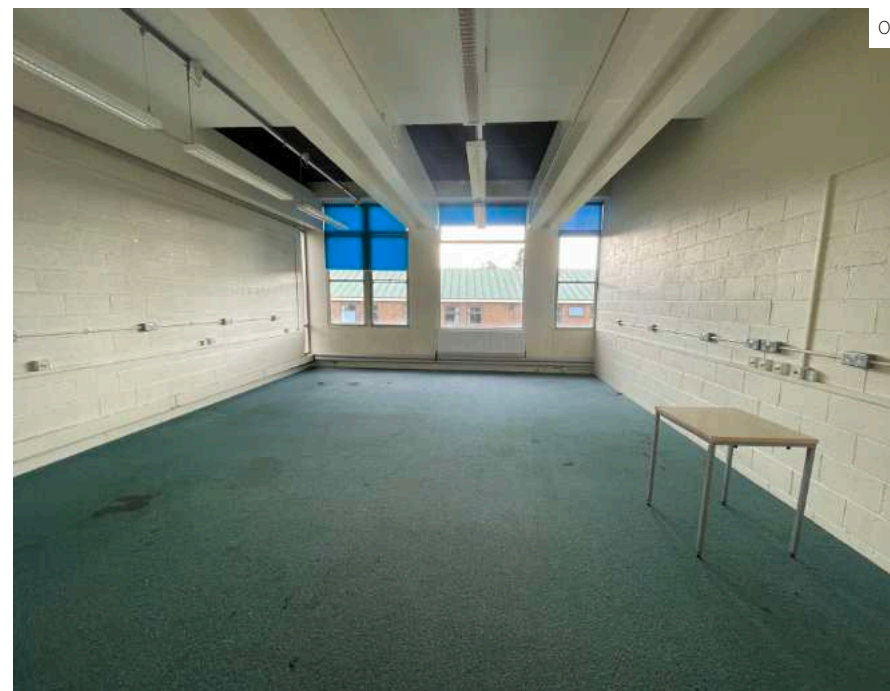
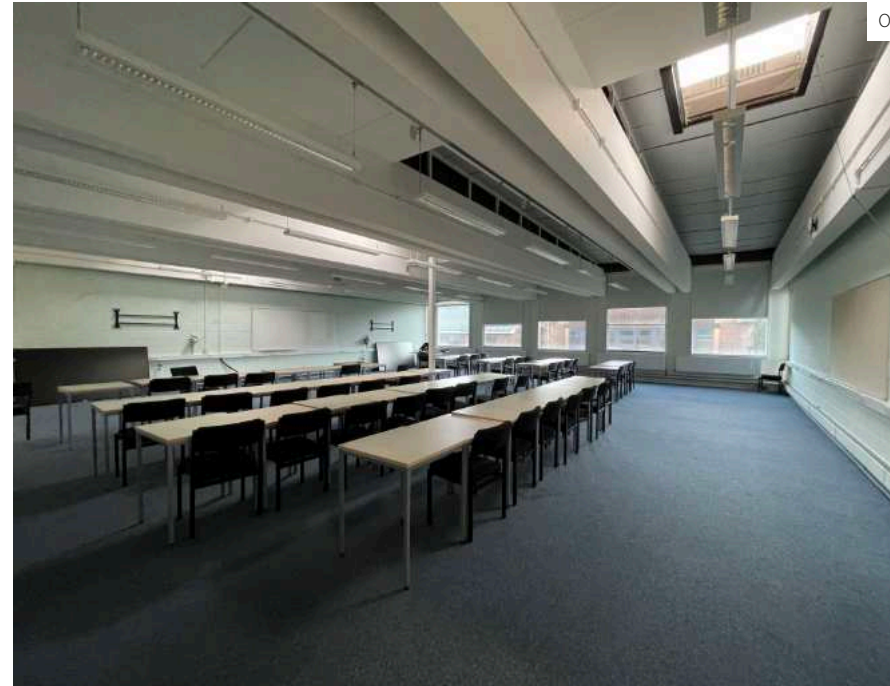
PROPOSED FURNITURE & FIXTURES



GENERAL TEACHING SPACES

EXISTING

- Various existing ceiling strategies, i.e. suspended ceiling tiles and acoustic boards.
- Inconsistent and tired wall and floor finishes.
- Painted concrete beams.
- Existing roof lights between beam spans.
- Exposed, painted blockwork walls.



01 Photo of existing second floor classroom space.

02 Photo of existing second floor classroom space.

03 Photo of existing second floor classroom space.

04 Photo of existing second floor classroom space.

GENERAL TEACHING SPACES

GENERAL LOOK & FEEL

Woodwool acoustic baffles will be suspended between the exposed beams, in a rhythmic pattern, allowing the structure to be clearly read. Mechanical plant will be hung between the concrete beam spans, partially concealed by the baffles below.

The teaching wall will be located by the classroom entrance door(s) and below a continuous bulkhead to conceal any mechanical plant routes.

AV screens and whiteboards will be located on all 3 x solid walls, to allow for clear visibility and teaching flexibility. Seating will be placed in rows, to maximise teaching capacity.



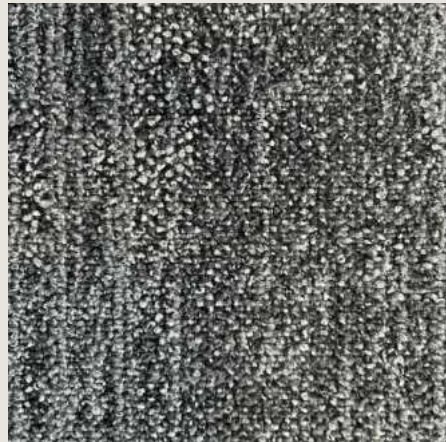
01 Indicative visual of the proposed large classroom spaces on the second floor.

GENERAL TEACHING SPACES

EXISTING



PROPOSED MATERIALS & FINISHES



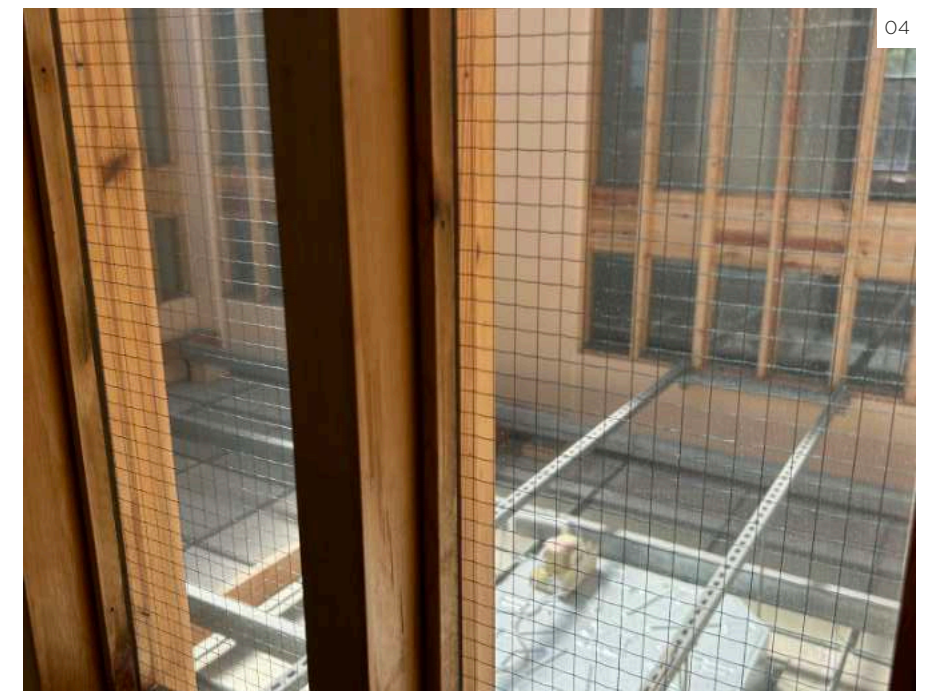
PROPOSED FURNITURE & FIXTURES



THIRD FLOOR CIRCULATION

EXISTING

- Narrow corridor widths of approximately 1000-1100mm on this level are not acceptable for good wheelchair accessibility and give a cramped claustrophobic feel to this level.
- Later interventions blocking lightwell view from third floor to second floor (Figure 04).
- Many existing cellular offices/rooms on third floor are not appropriate to modern teaching methods and ways of working.



- 01 Photo of existing lightwell views.
- 02 Photo of existing narrow third floor corridor.
- 03 Photo of existing third floor cellular offices.
- 04 Photo of existing intervention blocking lightwell.

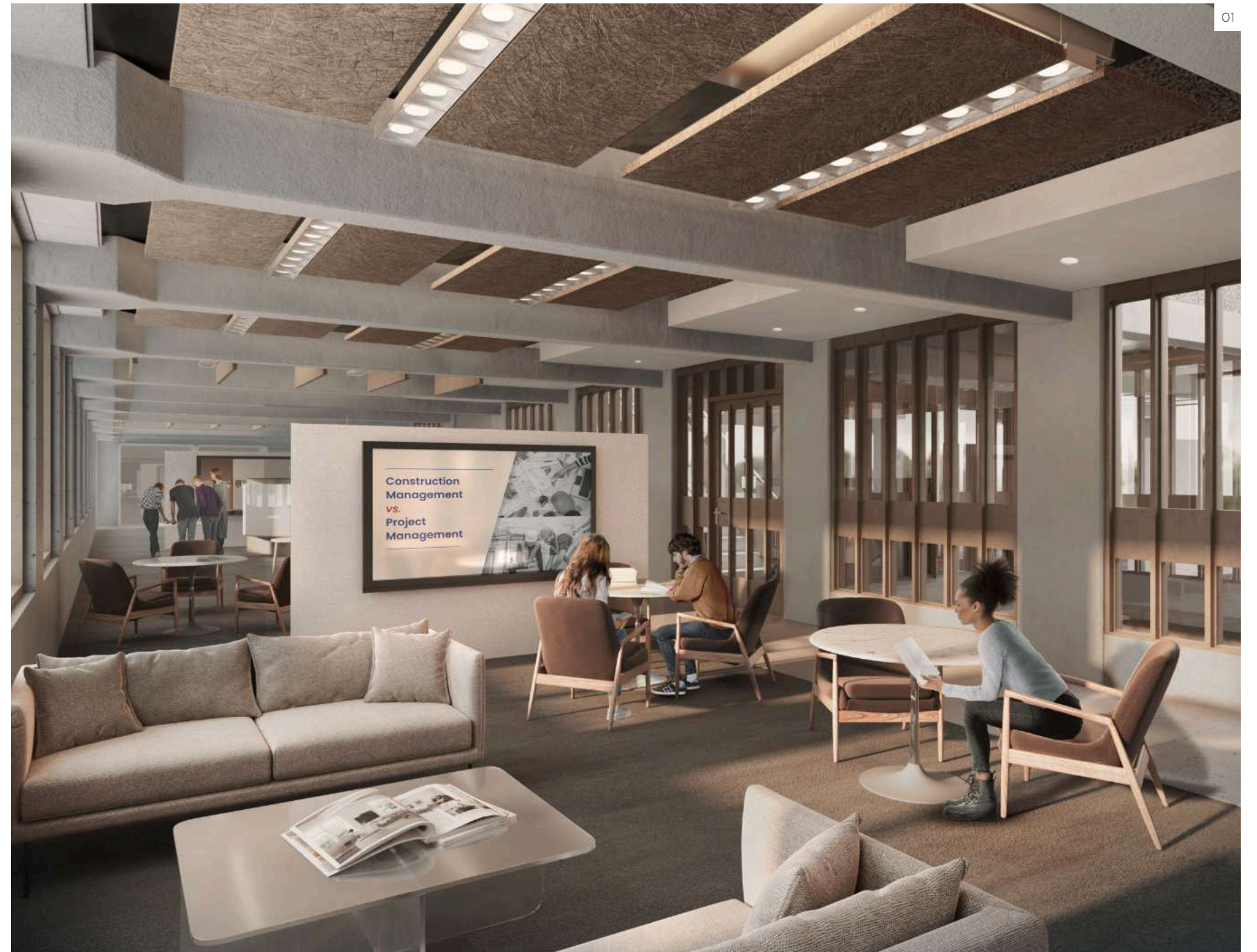
THIRD FLOOR CIRCULATION

PROPOSED - CME HEART

The resource room and social study space at the centre of the third floor will be the heart of the CME department. The longitudinal walls will be removed on this level to create this open flexible space. The two spaces will have refurbished timber screens to the lightwells running down the centre, giving both natural light and connectivity. Woodwool acoustic baffles will run between beams in both spaces and the flooring and bulkhead above will demark the linear circulation.

The flooring of the main circulation routes will contrast that of the designated study spaces, to highlight the longitudinal heritage of the building and 3rd floor.

Construction related supergraphics will be displayed along clear wall space and third floor main circulation routes.



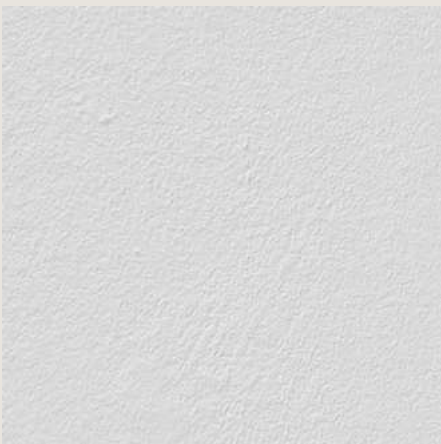
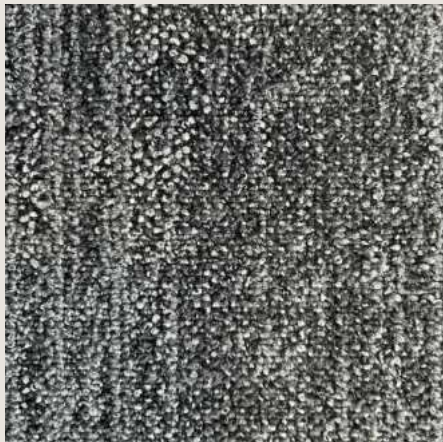
01 Indicative visual of the proposed 'CME Heart' on the third floor.

CME HEART

EXISTING



PROPOSED MATERIALS & FINISHES



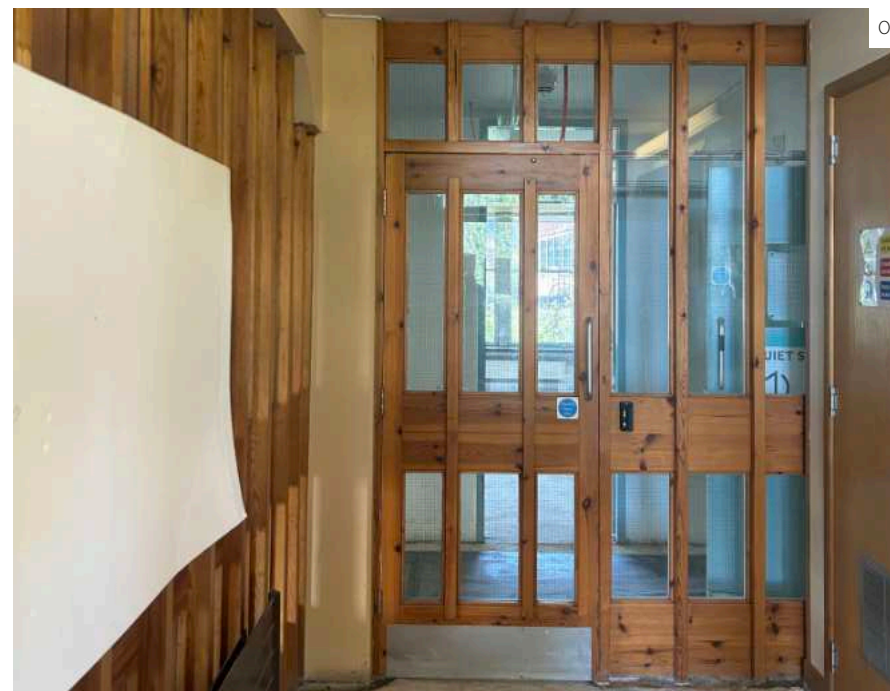
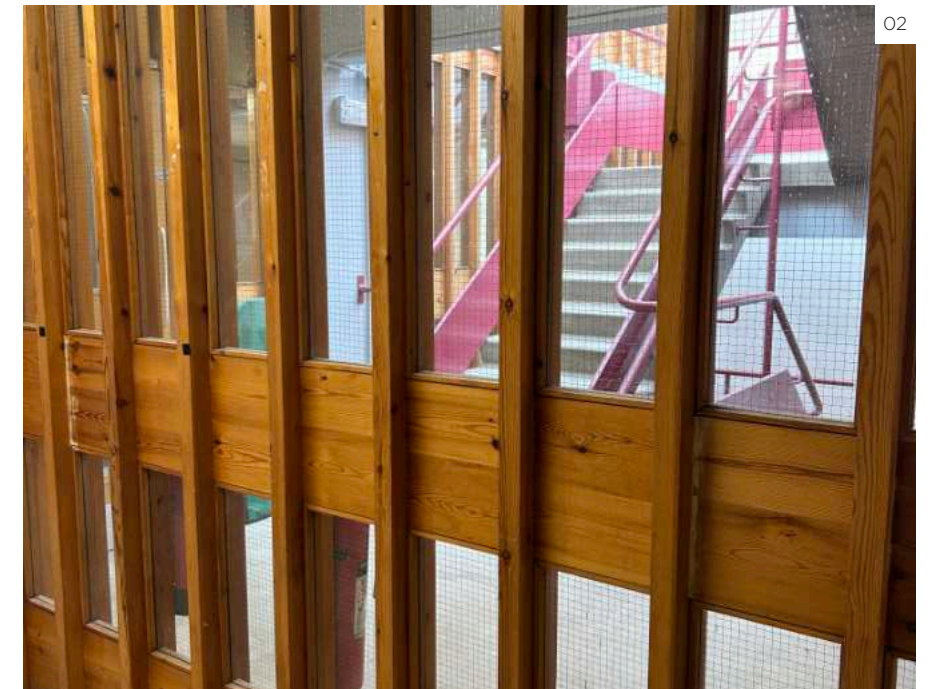
PROPOSED FURNITURE & FIXTURES



TIMBER GLAZED SCREENS

EXISTING

- The timber and glass screens are used throughout the building and are an important design feature and heritage asset.
- The timber screens either have a varnish/coating or in some cases have had areas painted over in white.
- The existing clear coatings appear to have aged and/or been exposed to long periods of sunlight/UV, causing the original coatings to darken in colour.
- The original mullions are at approximately 300mm centres with the recessed base, mid and head panels in wood and the glazing Georgian wired glass.
- Existing screen doors have a clear opening of approximately 800mm, which is narrow by current standards and limits fire evacuation capacity.



- 01 Existing timber glazed screen.
- 02 Existing timber glazed screen.
- 03 Existing timber glazed screen with door.
- 04 Existing painted timber glazed screen.

TIMBER GLAZED SCREENS

PROPOSED

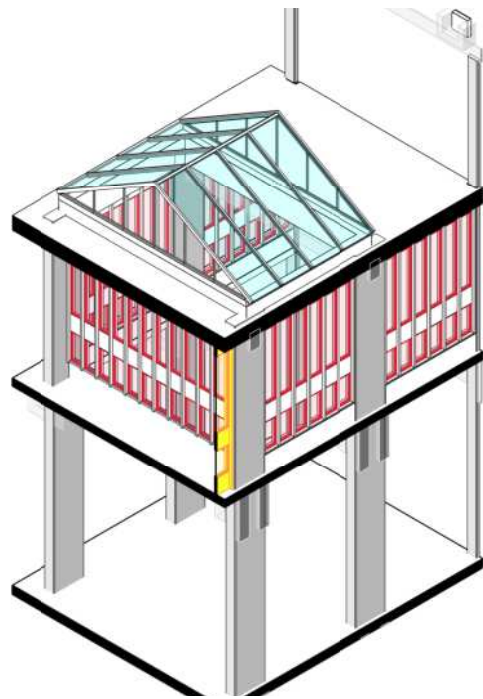
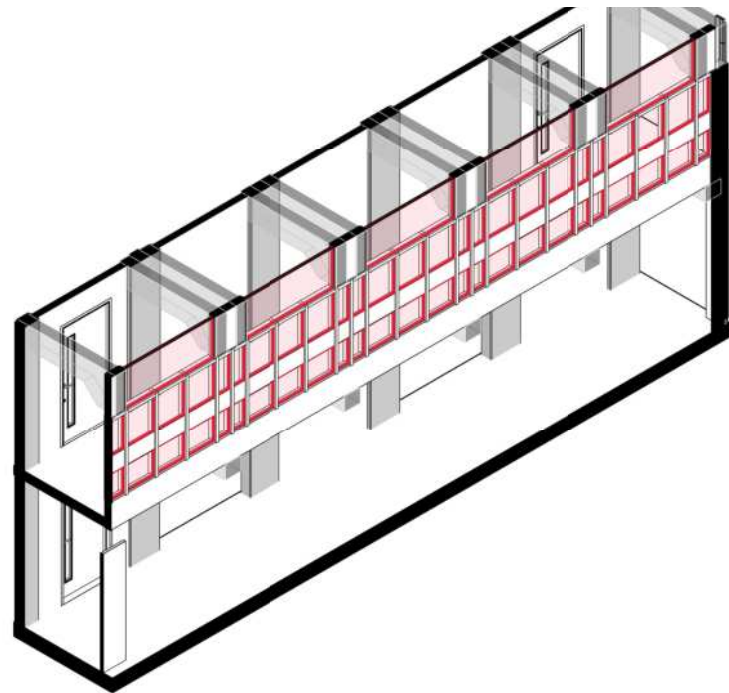
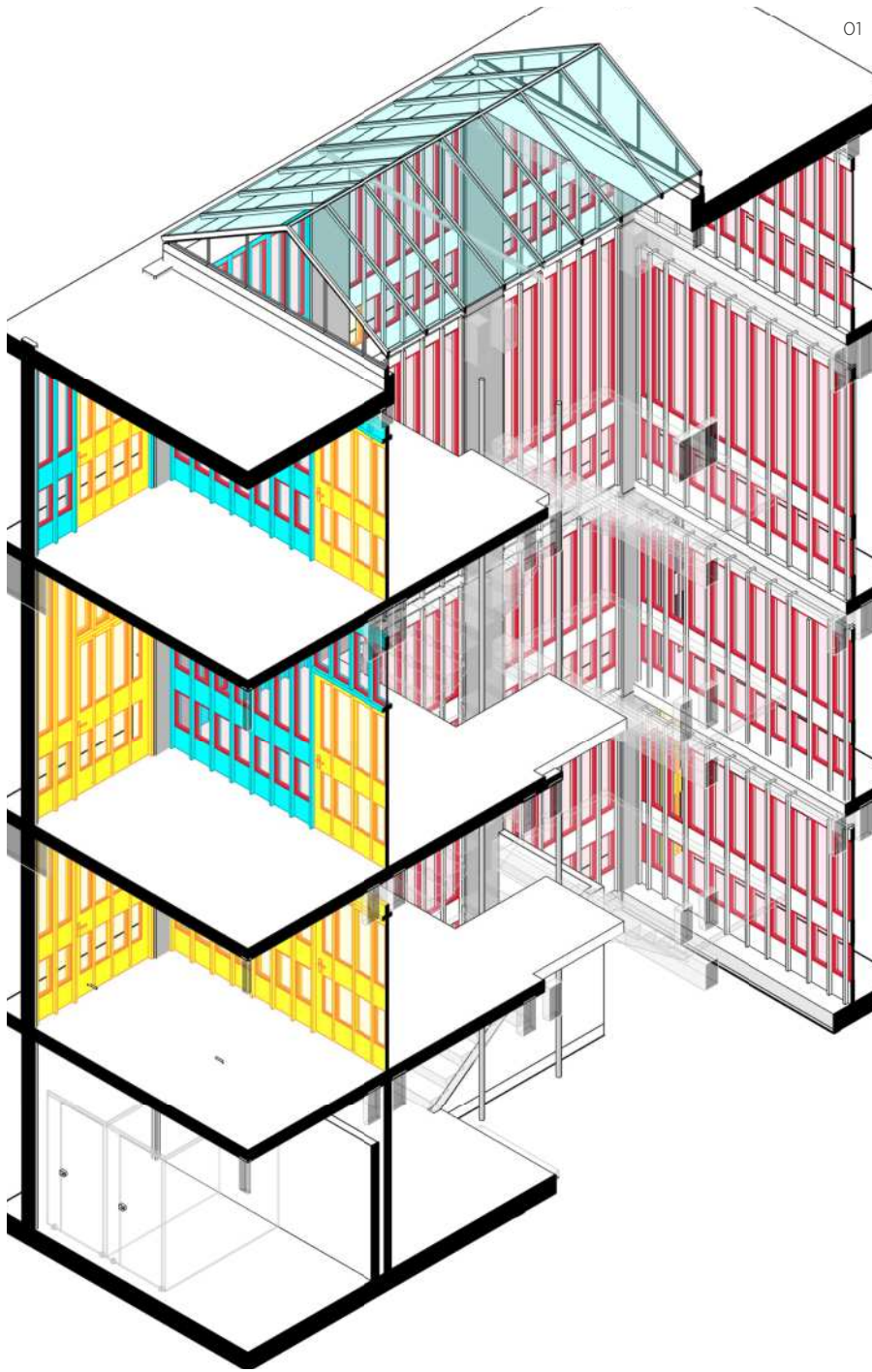
The existing timber glazed screens are of high heritage significance. The proposed refurbishment strategy includes replacing the existing Georgian wired glass with a new fire rated clear glass. This would also entail removing and replacing the existing timber beading with a matching bead, bedded in improved mastic.

The timber mullions and base, mid and head panels will be sanded back to original wood and resealed with a fire retardant clear coating. This should lighten the colour of the wood closer to its original tone.

The east and west stairs will be lobbied to increase fire capacity, which is discussed later in this document. Where necessary, new screens will be added to create these lobbies, which will be similar in appearance to the existing timber screens.

Please refer to **2360383-ACG-W033-ZZ-DR-A-27050 & 27051** in drawing pack for further detail on the proposed timber glazed screen strategy.

-  Glass/bead replacement only; timber fins/rails sanded back and resealed; replacement glass - clear, toughened, intumescent mastic (tbc), timber beads to match originals.
-  Remodelled screen using matching softwood fins/rails all prepped and sealed to match existing; replacement glass - clear, toughened, intumescent mastic (tbc), timber beads to match originals; new doors to match existing.
-  New screen using matching softwood fins/rails all prepped and sealed to match existing; new glass - clear, toughened, intumescent mastic (tbc), timber beads to match originals; new doors to match existing.

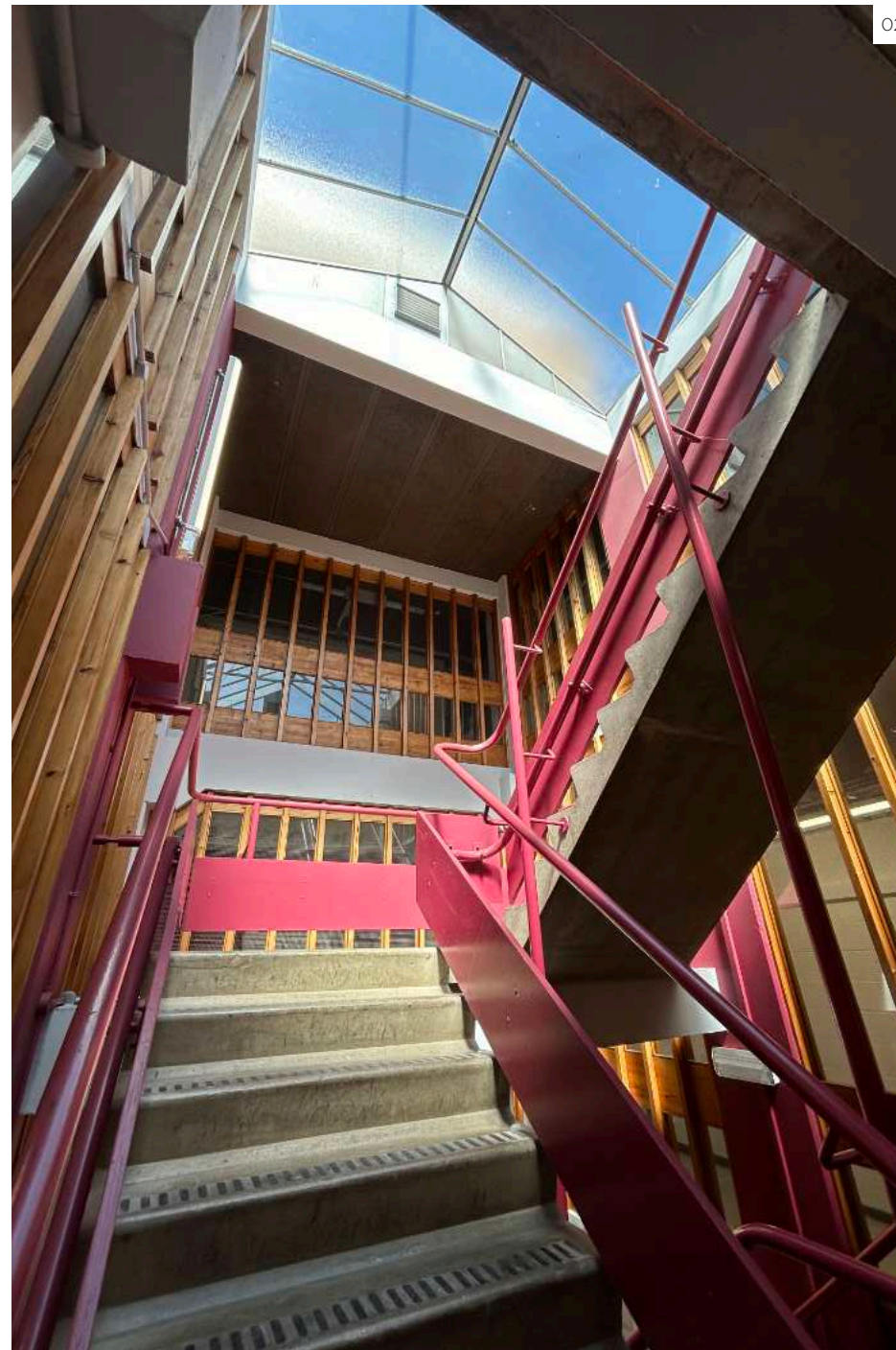
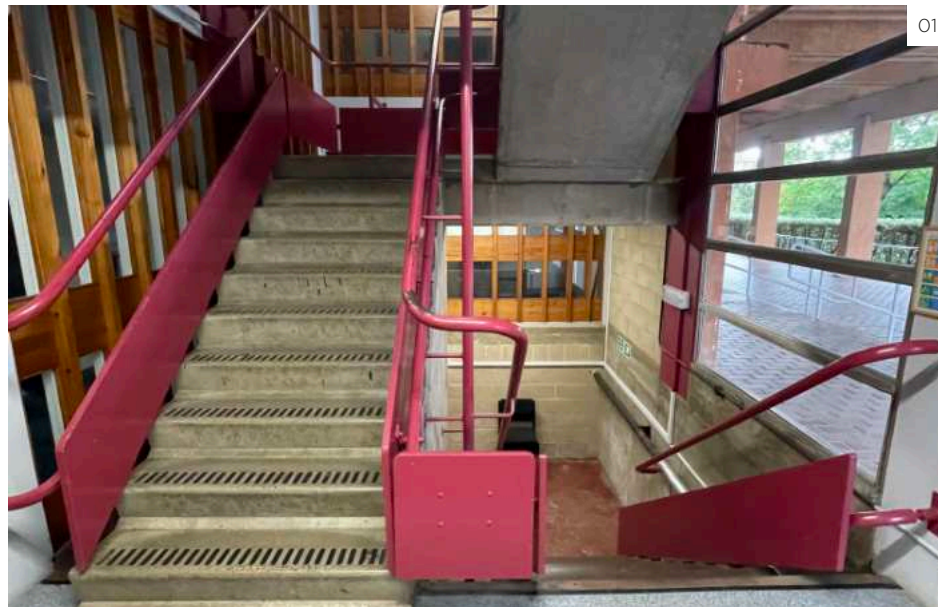


- 01** Annotated axonometric of internal stair core showing the proposed timber glazed screen strategy.
- 02** Annotated axonometric of double height ground floor space showing the proposed timber glazed screen strategy.
- 03** Annotated axonometric of lightwell showing the proposed timber glazed screen strategy.

INTERNAL STAIR CORES

EXISTING

- The existing stairwells are recognised as significant heritage features. In the November 1973 edition of the Architectural Review it can clearly be seen that the balustrade guarding is a natural wood finish.
- The existing stair core balustrades are now heavily painted and would not comply with current guarding regulations.
- The 3 original stair cores are directly accessible from the floor plate without lobbies. Many of the doors into these screens are later replacements fire doors.
- The original step nosings are a black grip strip set into mortar in a channel in the concrete stair tread which have been worn down from age creating a slip hazard.
- The existing timber glazed screens finish has aged due to being exposed to long periods of sunlight/UV, causing the original coatings to darken in colour.



01 Existing internal stair core.

02 Existing internal stair core.

03 Photo of original internal stair core, taken from the November 1973 edition of the Architectural Review.

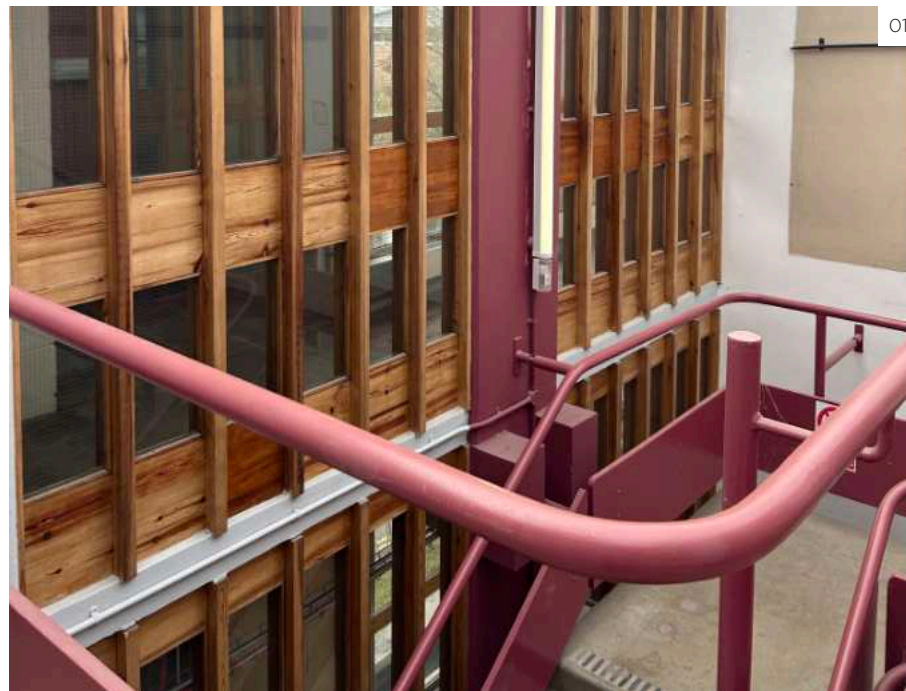
INTERNAL STAIR CORES

PROPOSED

To accommodate the increased building capacity, the East and West stair cores will be lobbied using new matching timber and glass screens. Some existing doors in existing screens will be removed and replaced by matching timber and glass sections, while in a few cases new doors will be inserted into existing screens.

Handrails and balustrading will be retained, refurbished and repainted in a dark contrasting colour. The lower timber guarding panel will be replaced with a taller element giving a little more protection while retaining the original look. It will be a natural wood finish to match the timber screens and original detail.

Options for a sensitive solution to the nosing detail is being reviewed to improve grip and riser visibility, while being sensitive to the original aesthetic.



01 Existing internal stair core 'look & feel'.

02 Proposed internal stair core 'look & feel'.

08

ENTRANCE

AYRE
CHAMBERLAIN
GAUNT

EXTERIOR WAYFINDING STRATEGY

OVERVIEW

The overall external wayfinding strategy will ensure minimal disruption to the significant building undercroft, whilst improving accessibility, inclusivity and wayfinding clarity.

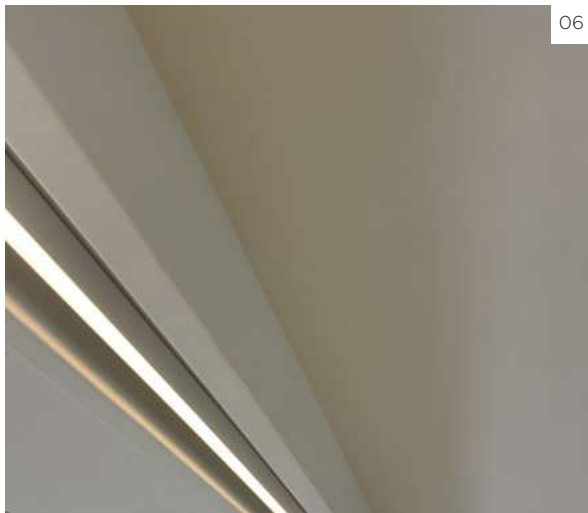
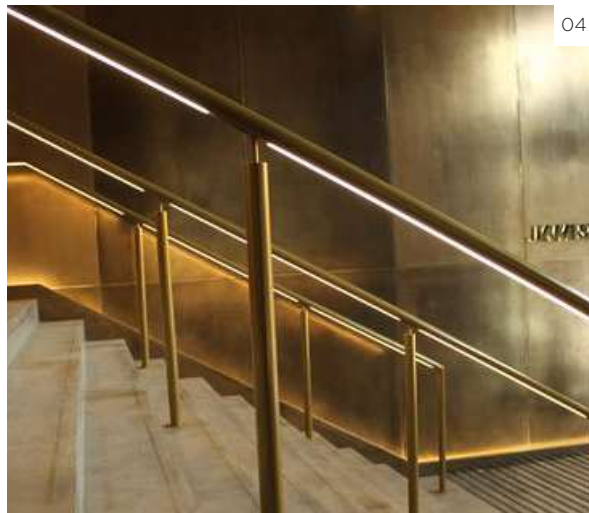
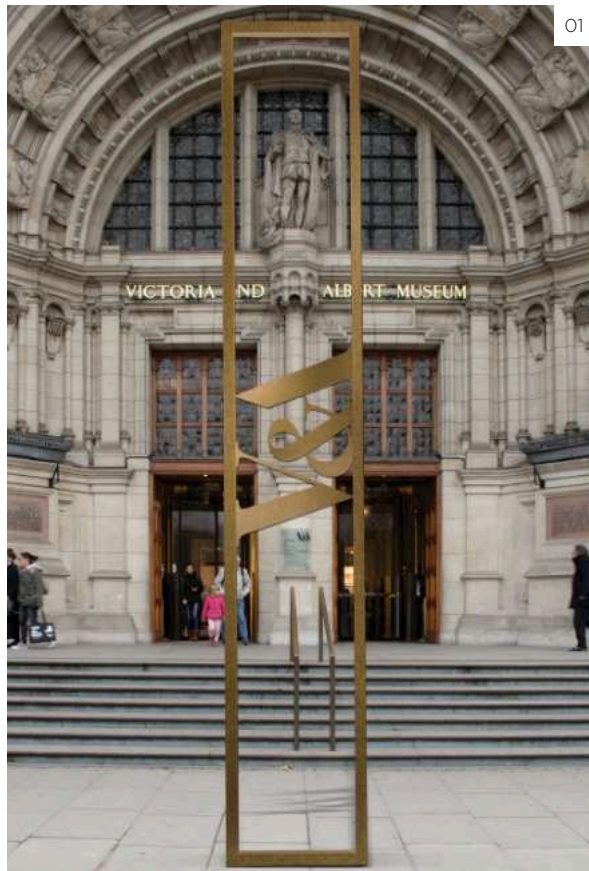
Existing (later addition) handrails will be replaced for new stainless steel balustrades, which look to incorporate lighting into the rail or flooring beneath.

Feature lighting will complement the linear concrete beams and signify the two East and West entrances, especially when there's limited natural daylight.

New signage at each entrance will help to signal and deflect people into what is a long building with difficult to identify entrances. Graphics will be similar to the interior signage and the 'hoops' help to signify the entrances, without blocking the long views of Chancellors Way.

Both entrances will have large text graphics written either side of main doors.

Signage in the landscape leading to URS will be using the established University design guide to keep site wide consistency.



01 Precedent image of an external 'hoop' sign.
02 Precedent image of black paving nosing.
03 Precedent image of an external totem sign.

04 Precedent image of handrails with light strips incorporated.
05 Precedent image of handrails.
06 Precedent image of feature lighting.

WEST ENTRANCE (MAIN)



EAST ENTRANCE (SECONDARY)



09 STRATEGIES

AYRE
CHAMBERLAIN
GAUNT

SUSTAINABILITY OVERVIEW

STANDARDS

The refurbishment of the URS building represents an ideal opportunity for the University of Reading to improve its sustainability credentials, as well as supporting the University in achieving their target of achieving Net Zero Carbon by 2030. The University has explored various environmental standards to enhance the energy efficiency of the building, with considerations including Enerphit. However, while there are no planning requirements driving the environmental brief, BREEAM 'Very Good' is being targeted as minimum, using BREEAM 2014 refurbishment and fit-out assessment criteria.

Our BREEAM consultants suggest the URS Building proposal could achieve an overall score of 62.13%, which classifies as BREEAM 'Very Good'. It is also noted that the project is committed to achieving at least the minimum 'Very Good' threshold of 55%.

The BREEAM target was reviewed with Estates Stakeholders, as a team we discussed each credit to ensure alignment with University Sustainability and Life Costing goals. Aligning the refurbishment with UoR Design Standards and ensuring future-proofing for growth and change is central to the Project Team's core deliverables.

FABRIC FIRST

The refurbishment of the building falls under Building Regulations Approved Document Part L2B which requires improvements in fabric to minimum standards although its heritage status will limit what can be done.

However, it is proposed for the building fabric to exceed the Approved Document values where possible within the constraints of the building. Building fabric improvements have been established by ACG, who have investigated the feasibility of improving fabric and glazing elements in keeping with the URS building's heritage status.

OVERHEATING

To understand predictive comfort of occupants in summer conditions, iterative overheating modelling has been undertaken for the building following CIBSE TM52 Overheating criteria.

Reduction of overheating can be achieved through passive design, such as building orientation, solar shading, facade glazing design and exposed thermal mass. Due to the listed building status, such passive elements that have the most impact upon overheating cannot be modified. The inherent exposed structural is retained however and can provide higher levels of thermal mass and facilitate improved nighttime cooling after a warm summer's day.

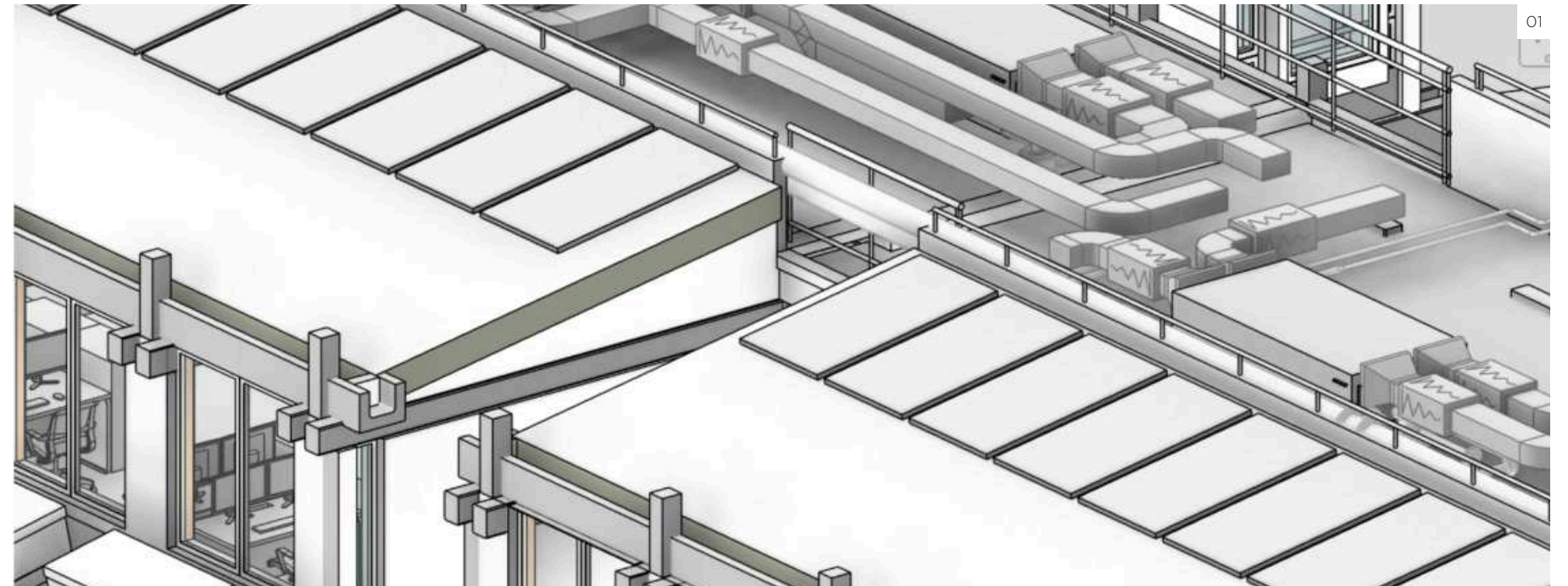
The window replacement strategy will aim to help improve overheating issues, through improved u-values, low G-value glazing to limit solar gain and the introduction of natural ventilation.

RENEWABLES

PROPOSED SOLAR PV PANELS

Notwithstanding Heritage constraints, opportunities exist for large amounts of solar PV, due to the building's north/south orientation and roof form. The proposal illustrates a continuous row of PV panels (approximately 140m²), which will be relatively hidden from view on the level 3 roof and accessible for cleaning and maintenance from the accessible flat roof.

In terms of low carbon heating systems, the building is already connected to the campus heat network so changing to low carbon heating within the building is outside the scope of the project although is a planned future upgrade.



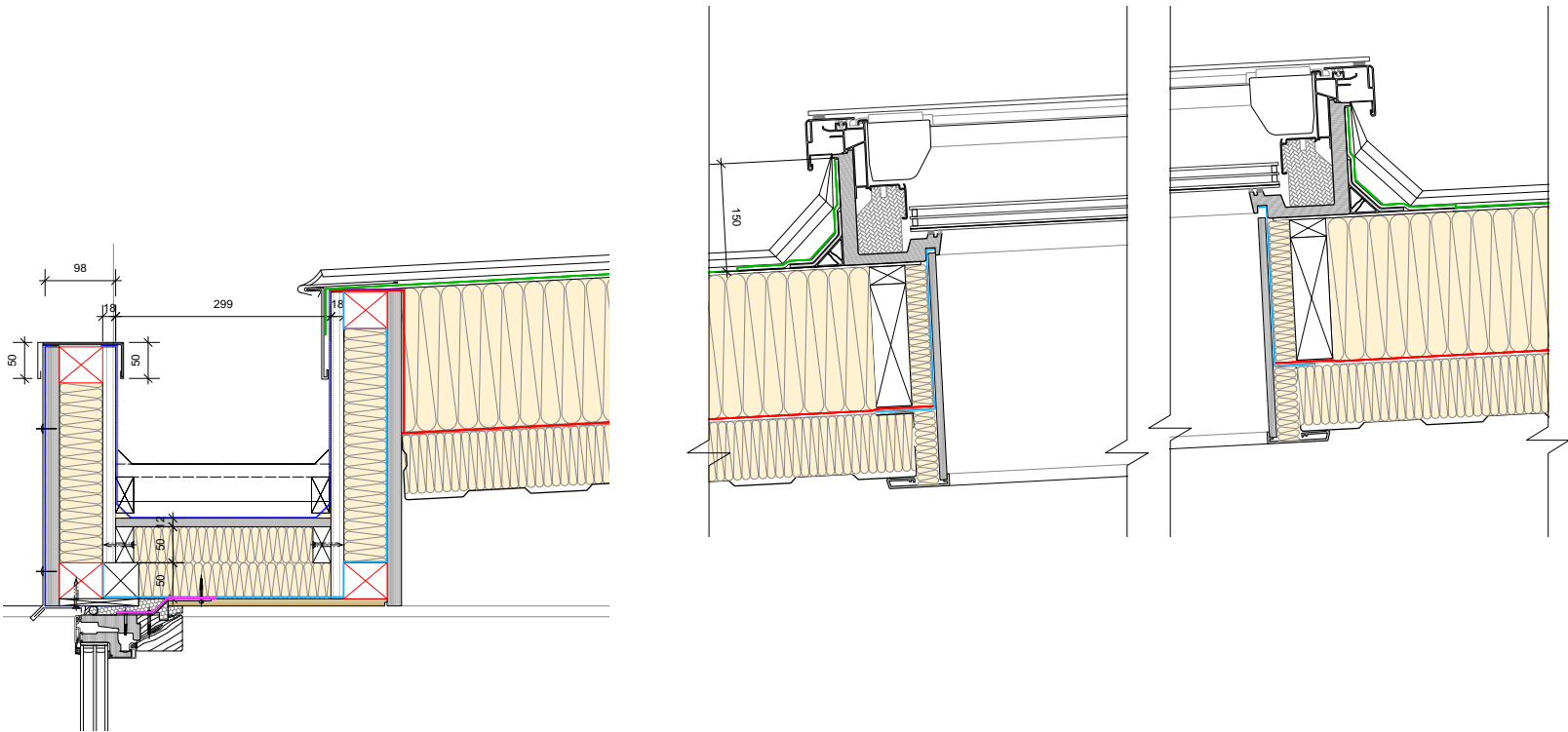
- 01 Indicative visual of the solar pv panels on level 3 roof.
- 02 Precedent image of solar panels attached to a standing seam roof.
- 03 Precedent image of solar panels attached to a standing seam roof.

ENVELOPE ENHANCEMENT

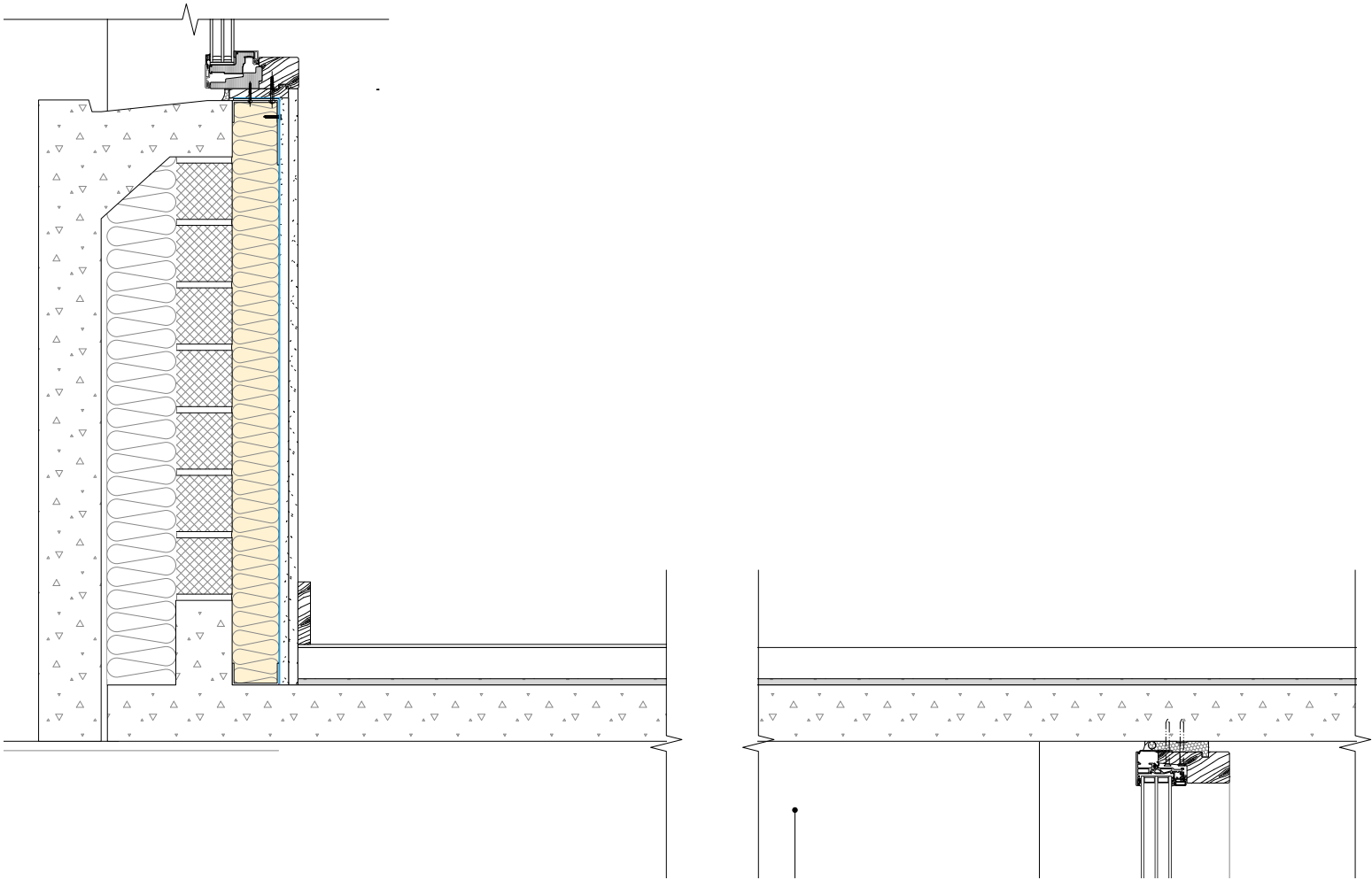
FABRIC FIRST

While standards like Enerphit present valuable benchmarks for fabric efficiency improvements, the constraints imposed by the existing building and its listing make achieving Enerphit potentially a costly endeavour without guaranteed success. However, the LETI Climate Emergency Retrofit Guide offers valuable guidance. Although primarily geared towards residential structures, this guide prioritises considerations such as historic significance. Each facade or element is considered 'constrained' or 'unconstrained,' with target U values established, and suggested strategies are examined for each element within different heritage constraints. Target U values have been set.

Roof	0.16W/m2K
Walls	0.24W/m2K
Windows	0.9W/m2K
Exposed Floors	0.5W/m2K



01



01 Proposed section details of the typical floor, wall and roof build-ups (nts).

ENVELOPE ENHANCEMENT

ROOF AND OVERHANG

Roofing is replaced completely with new deck and warm roof insulation over. The waterproof sheeting is matched as close as possible to the existing mill finish aluminium. Mineral wool insulation is proposed being non-combustible.

To insulate the overhanging soffits and protect against the many cold bridges created by the concrete beams we have opted to insulate above the slab. This entails replacing the existing floor screed with a thermally insulating product. This also has the benefit of reducing the dead load on the building as a new screed will be lighter than the old removed screed and the condition of the existing screed is very poor and will likely suffer more damage during the construction period.

WALLS

Opening up works have revealed unknown insulation product within the existing cavity. This would be retained and the internal blockwork face would be thermally lined and boarded.

The cold bridge penetrations from the concrete beams need careful analysis and in Stage 4 specialist advice and assessment will be sought to calculate interstitial condensation risk. This may require breathable products to allow any condensation forming within the wall build up to escape.

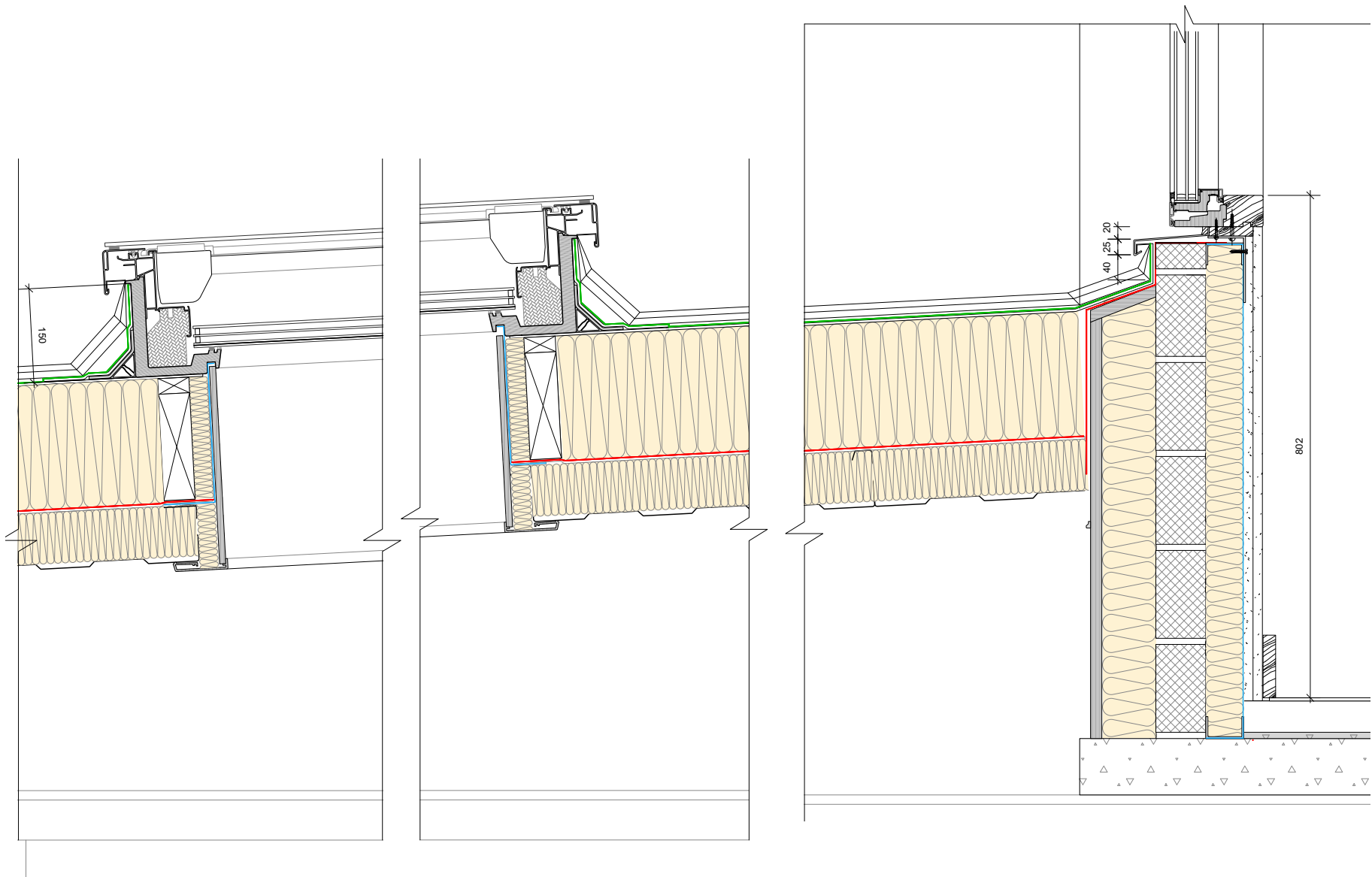
It is understood that encapsulating the beams to insulate them will not likely be acceptable to the planning authority due to the high heritage significance of the building's visible structure. Following condensation analysis in Stage 4 a robust strategy will be sought to protect the building from damage through moisture.

WINDOWS

Low G value glass will be used on south/east/west elevations to limit solar gain.

The proposed glazing system is triple glazed which will have a big impact on the building's performance considering the proportion of the facade which is window.

01 Proposed section details of the roof and sill junctions (nts).

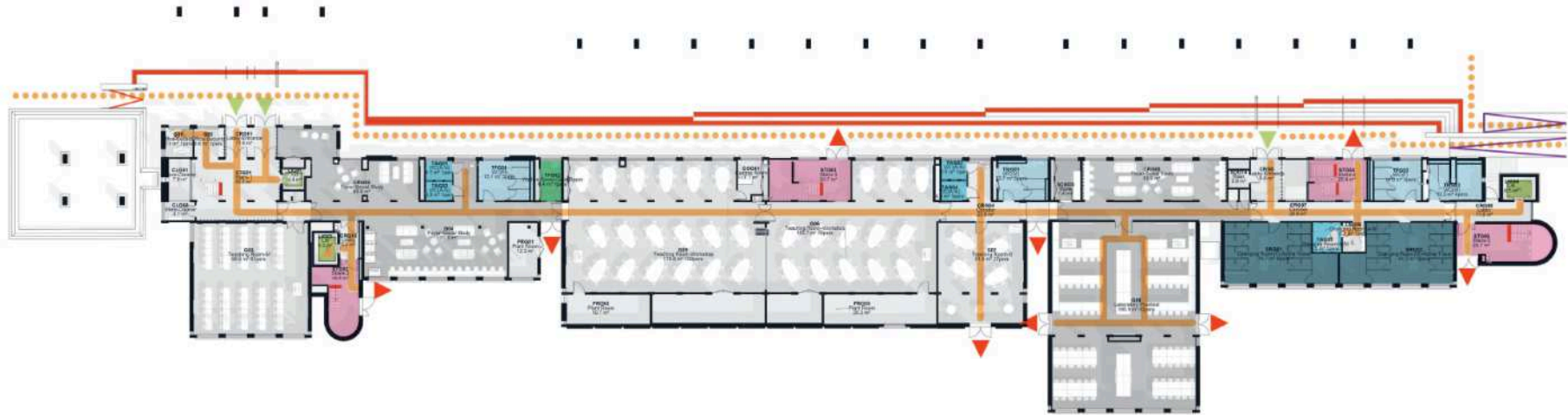


ACCESSIBILITY

ACCESSIBILITY AIMS

The refurbishment proposals for the URS Building are designed to be as inclusive as possible so that the building can be comfortably and independently used by students, people working in and visiting the development, and the wider community.

The development has the potential to meet the guidance of Approved Document M, Volume 2, relevant British Standards and contemporary requirements/expectations, giving the constraints of the existing building. Access to and within the building is being improved while protecting its historic significance, in line with the relevant Wokingham Borough Council policies.



GROUND FLOOR

- | | | | |
|--------------------------------------|-----------------------------|--------------------------|-----------------------------|
| external wheelchair accessible route | passenger lift | escape stairs | accessible WC/shower |
| internal wheelchair accessible route | passenger / evacuation lift | safe refuge | WC |
| public accessible entrance | fire-fighting lift | ramp ($\leq 1:20$) | changing rooms/showers |
| accessible emergency exit | platform lift | gradient ($\geq 1:21$) | quiet room |
| stepped entry / exit | step | accessible WC | wheelchair spectator spaces |

01 Ground floor plan with accessibility annotations.

ACCESSIBILITY IMPROVEMENTS

OVERVIEW

Improvements to the accessibility of the building have been central to the design development during RIBA Stage 3. Wherever practically possible, the design team have sought to bring the building up to current standards of the Building Regulations, specifically Part M and Part T, and to develop proposals as if the project were a 'new build'.

- The existing internal stair cores are currently 1200mm wide, this cannot be increased but improvements in guarding and visibility are planned. The proposals also include the introduction of two new external stair cores which will have a width of 1200mm/1600mm and are fully Part M compliant.
- Two new lifts of 1275kg and 1600kg will be added within the new external stair cores. This size is capable of taking the largest mobility scooters. There will also be efforts to provide disabled access to the half level on the west end of 01 level, through the introduction of a platform lift in the existing west lift shaft.
- Existing corridor widths (on the whole) are above the minimum Part M standard for existing buildings. In areas where there is expected to be high student traffic, some internal walls have been removed to provide 'breathing room' (for example, the social study space on level 02).
- As part of the refurbishment works, all doors will be replaced with new Part M compliant doors where possible. This will require increasing the opening width of many existing door frames to achieve the width needed.
- WCs have a 'flip-flopping' strategy, where by each floor the (F) and (M) WCs alternate floorplate locations to create an even spread throughout the building's long axis. Accessible WCs, however, remain in the same/similar locations on each level - west, centre and east.

- 01 Annotated 00 level plan.
- 02 Annotated 02 level plan.
- 03 Annotated 03 level plan.

KEY:

CHANGING ROOM (A-N) & WC (A-N)

CHANGING ROOM (F) & WC (F)

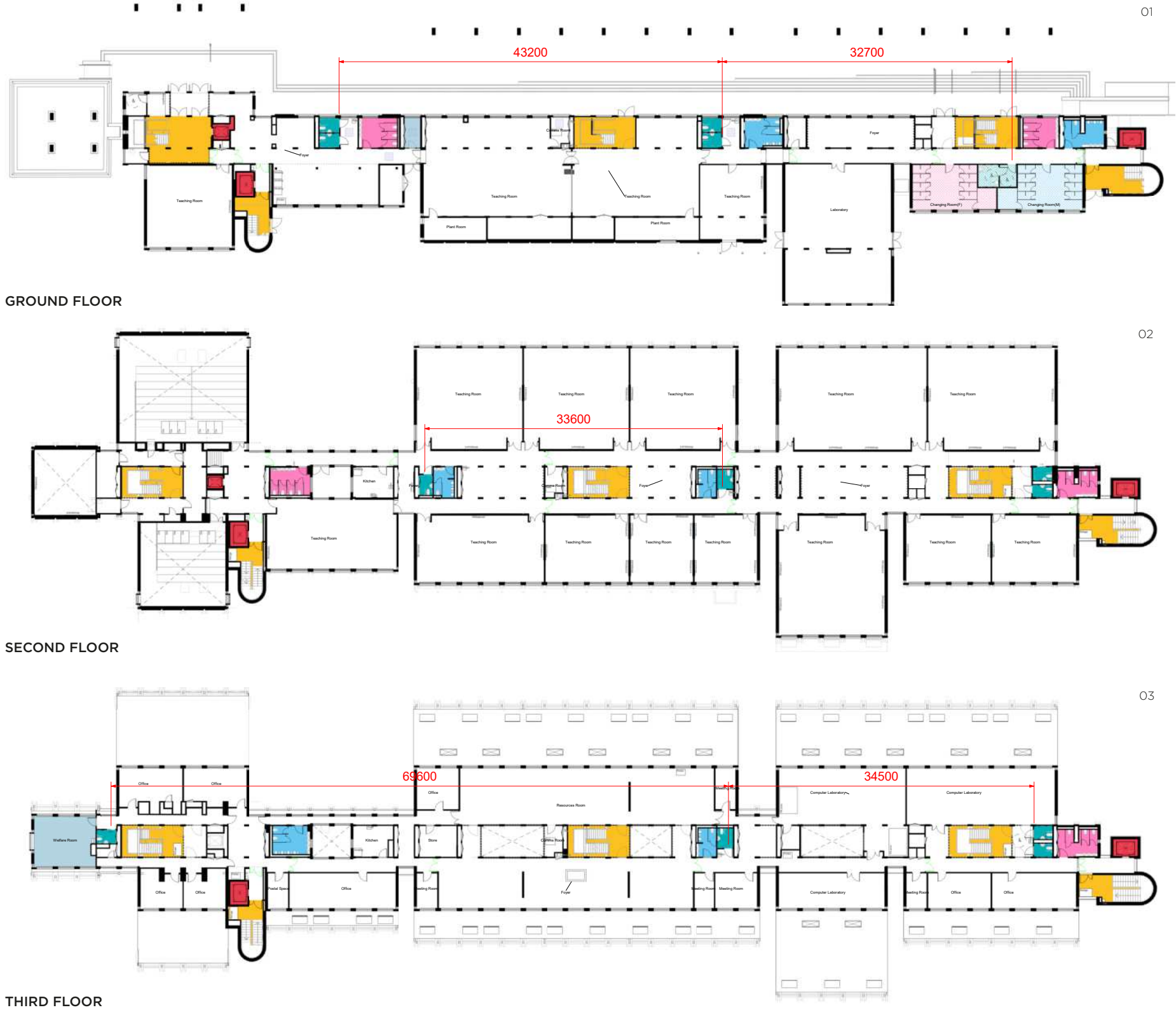
CHANGING ROOM (M) & WC (M)

WELFARE ROOM

LIFT

STAIR

DOORS ON HOLDBACKS



FIRE

OVERVIEW

Fire escape capacity of the 3 existing stairs has been assessed by the Fire Consultant and was deemed inadequate for the numbers of people proposed in the reconfigured building. Lobbying two of these stairs improves the situation, but two additional stairs are required to meet the occupancy demand.

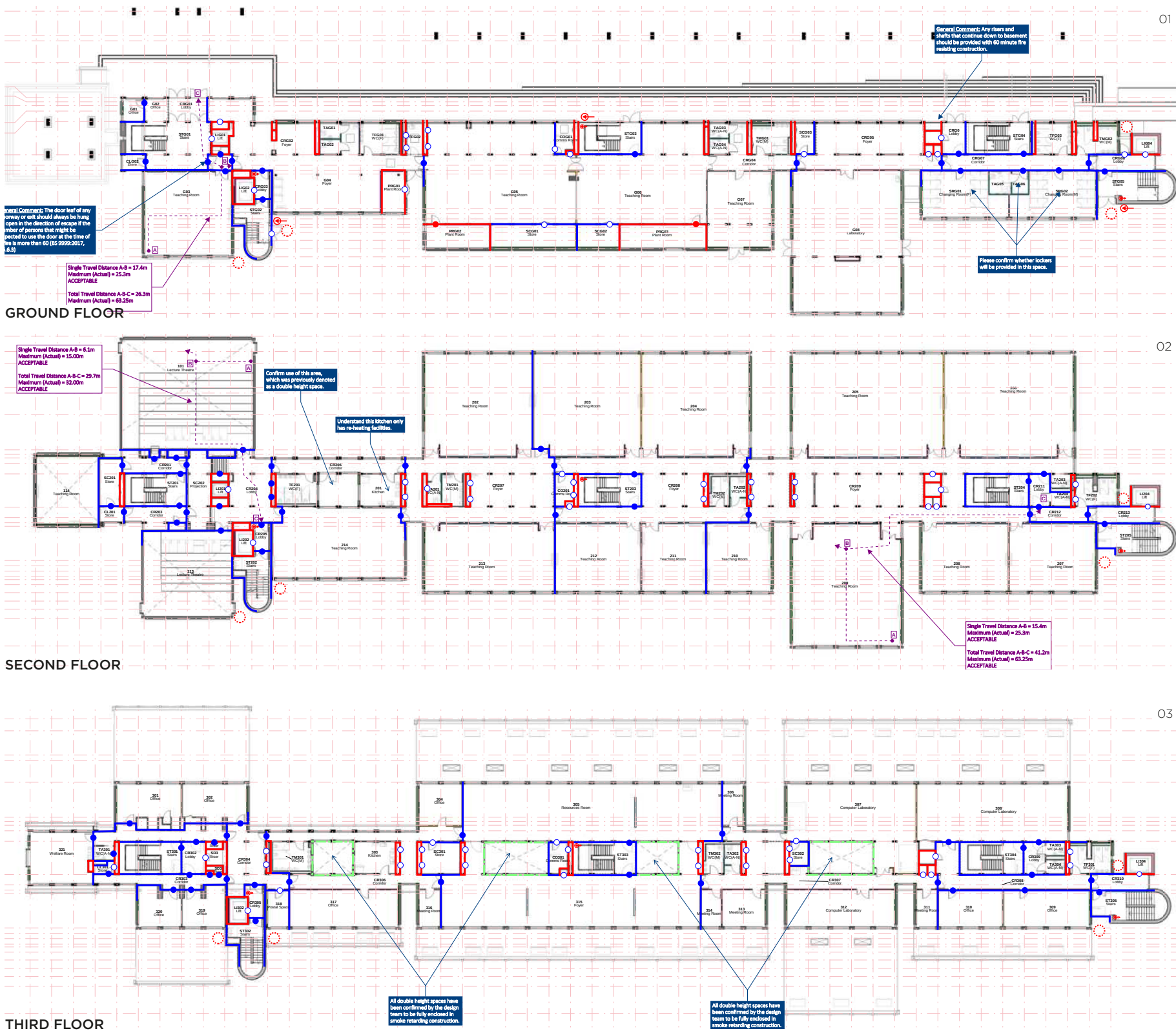
Although not a statutory requirement, the University requires new lifts to be evacuation lifts. These are provided in each of the new stair cores.

Level 2 introduces large areas of social study space within the circulation. These spaces will include furniture, therefore the classrooms exiting into this area would be considered inner rooms. To mitigate this, rooms will be provided with multiple outward-opening exits to suit the occupancy. The furnishing of the social spaces will be inherently fire resisting. These spaces are at the base of an existing roof opening, which is enclosed on upper floors by smoke resisting construction. The existing condition of the roof opening will be improved by the provision of smoke ventilation from the rooflights at the head of the smoke reservoirs, which will clear smoke for the benefit of the fire service. Furthermore, an automatic category L1 fire detection and alarm system will be provided throughout the building, offering the earliest possible warning of fire.

KEY:

- FD30 FIRE DOOR
- FD30S FIRE DOOR
- FD60S FIRE DOOR
- 30min FIRE RATED CONSTRUCTION
- 60min FIRE RATED CONSTRUCTION

- 01 Annotated 00 level plan.
- 02 Annotated 02 level plan.
- 03 Annotated 03 level plan.



CONCRETE REPAIR STRATEGY

STRUCTURAL CONDITION

The brief for the structural engineering on the scheme is to preserve, strengthen and repair the 50-year-old structure, whilst also assessing the implications on the wider redevelopment works.

The concrete survey contractor (Concrete Repairs Limited) completed their survey work back in August 2024 and found a number of visible and hidden defects from their tests. The condition of the structure on the whole is reasonable given its age but localised defects need addressing as well as consideration of future protection measures to improve long-term durability.

The most significant findings were the lack of duct grouting and visible tendon corrosion within the post-tensioned beams. This is a sign of both poor workmanship in the original build and deterioration over time. Other issues included high carbonation levels in the external concrete generally due to weathering.

Purcell and Curtins have categorised priority defects from both a heritage and structural significance as well as from a health & safety perspective e.g. falling debris. Refer to Figure 01, which shows an example of spalled concrete column and possible loose debris.

PREVIOUS CONCRETE REPAIRS

Previous poor quality concrete patch repairs have also negatively affected the building’s external appearance. These conventional concrete repairs have used a grey pigmented product which does not resemble the surrounding ochre-coloured concrete (see Figure 02).

The condition and durability of these previous repairs appears to be intact with no delamination or further spalling at these locations. However, the removal of these grey patch repairs is to be considered based on their heritage impact. Reinstatement with a suitable repair that matches the colour and texture of the original structure will be implemented.



01 Concrete spalling and exposed reinforcement on external RC column.



02 Poor quality previous concrete repairs on east elevation façade.

CONCRETE REPAIR STRATEGY

CONCRETE REPAIRS & PROTECTION MEASURES

A summary is provided below on the suggested repair strategy and additional protection coatings required to extend the lifespan of the building. All repair and protection options mentioned are subject to further trial test samples during the next design stage, RIBA Stage 4.

A) Removal of existing poor quality concrete repairs, priority is to be based on heritage impact defined by Purcell.

B) Clean and prepare external concrete surfaces for application of protection measures. Cleaning requirements will be defined by the product manufacturer and Purcell.

- Possible Option: Jet wash of all external concrete columns and beams. Steam clean of the potentially fragile concrete cladding panels may be necessary to avoid risk of damage.

C) Patch concrete repairs to areas of spalled, cracked concrete and previous repair reinstatement.

- Repairs with exposed reinforcement should be primed with a protective coating to reduce further corrosion and enable re-passivation of the reinforcement steel.
 - Possible Option: Apply SikaTop Armatec 110 Epo Cem primer (or similar)
- Patch repairs to be made using either hand applied concrete repair mortars or using poured concrete. Either option is to ensure the colour and textured finish match the existing concrete.
 - Possible option: Apply Sika MonoTop-225 Colour Match repair mortar (or similar)

D) Apply a corrosion inhibitor coating to all external faces of structural concrete that will diffuse through pores and protect

reinforcement steel that has started to corrode and delay the onset of corrosion in unaffected reinforcement.

- Possible option: Apply Sika Ferrogard 903+ Corrosion Inhibiting Impregnation coating (or similar)

E) Apply a further anti-carbonation coating or hydrophilic impregnation protection to all external faces of structural concrete. The product will need to be a water based and transparent with a matt finish and UV resistant to match the existing condition.

- Possible option: Apply Sika Siloxane based water repellent impregnation coating (or similar)

At the next design stage, RIBA Stage 4, it is recommended that further trial testing and samples are carried out on site to review coating and repair options. The testing will either be on a mock-up rig or undertaken directly on the structure itself. The latter will require listed building consent. An outline of the testing process is summarised below:

- Arrange for a test clean on a sample of external concrete elements (beams, columns and cladding panels).
- Apply various coating protection options on a test area. Sample areas to include at least 1 beam, 1 column and 1 cladding panel.
- Compare results of hand-applied concrete repair mortar and shuttered poured concrete. Colour matching and pigmentation of repairs to match existing is to be carefully considered. Refer to Figures 01 and 02 for the existing colour scheme.



01 Existing pigmented concrete (ochre).

02 Existing concrete cladding panels finished with exposed Thames Valley aggregate.

CONCRETE MAINTENANCE STRATEGY

PLAN

The need for maintenance is primarily determined by two key factors, Loss of functionality and aesthetic considerations. Recent advancements in technology have led to the development of modern repair mortars and surface treatments. When applied correctly, these materials can provide effective performance for many years, often lasting 10 years or more. However, like all materials, they will eventually deteriorate and require maintenance

Life to first major maintenance of protection coatings and concrete repairs is likely to be within the range of 5-15 years. The maintenance plan is to be agreed at the next design stage with the client and discussions with potential product suppliers regarding their repair system warranties. For instance, SIKA can provide a high-performance concrete repair system, which carries a 10-15-year guarantee.

SCOPE

SEASONAL HOUSEKEEPING

To ensure proper maintenance and functionality of the building, the following tasks need to be addressed.

- Cleaning of the drainage systems and roof gutters to prevent blockages. Ensure rainwater is free to flow off the building and does not pond for prolonged periods.
- Periodically remove any bird nests or residues that may obstruct airflow or drainage. (Consultation with an Ecologist required)
- Inspect and test rainwater outlets and associated chambers to check for damage or signs of wear.
- Remove any soiling and dirt retention that can cause any blockages or discolouration of the building. Ensure this task is

carried out ahead of the annual visual inspection and in areas that might require inspection or maintenance.

REGULAR VISUAL INSPECTIONS

Once all repairs and protective measures have been completed, an annual visual inspection regime should be implemented.

The inspections should be carried out by suitably qualified personnel who are familiar with the repair history of the building and aware of all the protective treatments/measures and repair techniques that have been applied.

The objective of the inspection is to have a walk-around of the structure at the ground level and inspect every vertical and horizontal surface of the elevations, with the aid of binoculars for the higher points. Mobile elevated working platform (MEWP) or scaffold access may be required to access the higher levels.

For the areas where previous repairs or surface treatments have been applied, some of the defects to look for include:

- Chalking (the formation of white, powdery residue on the surface of concrete)
- Colour changing
- Flaking (either of concrete laitance, or cover, or the surface coating)
- Cracking of concrete, crazing
- Loss of adhesion
- Blistering (small, round and raised areas formed by entrapped water vapour in surface-treated areas)
- Efflorescence

- Spalling
- Lime leaching (similar to ‘chalking’)
- Freeze-thaw damage (similar to ‘spalling’)
- Biological growth, algae,

A detailed logbook is essential for documenting all identified defects and the subsequent repairs performed. This log should include the following information:

- The date of each inspection conducted, noting who performed it.
- Description of each defect found, including its specific location and nature.
- Detailed accounts of the repairs carried out and methods used to address each issue.
- Dates when the repairs were completed, along with any follow-up inspections to ensure the effectiveness of the repairs.
- Specifications of the materials utilised in the repairs, including brand names, quantities, and any relevant safety or compliance information.

Maintaining a detailed logbook will provide a clear record of the condition and maintenance history of the equipment or facility, ensuring accountability and aiding in future maintenance planning.

M&E

VENTILATION STRATEGY

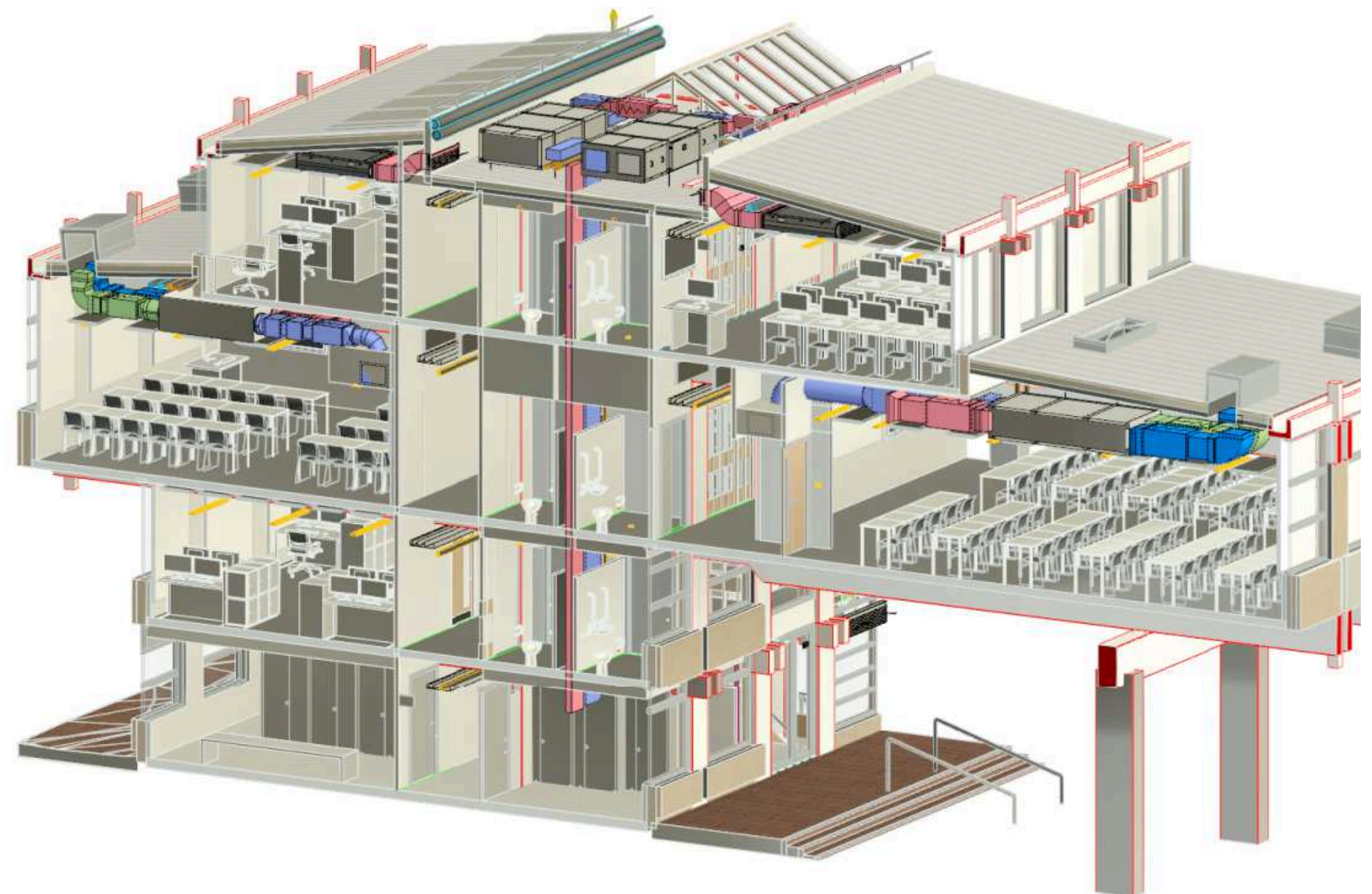
The following pages identify the outline scope of ventilation system works in connection with the refurbishment of the University of Reading's URS Building on the Whiteknights Campus.

Given the URS building has heritage value with a Grade II listing status, it is implicit that the provision of all new M&E services needs to cause as little disruption as possible to the building fabric. Any new services will need to be sympathetic to their surroundings, and should not detract from the appearance of the building, its fabric or its contents. The ventilation system design therefore utilises existing plant spaces and voids, rather than cutting in new wherever possible.

One of the key briefing requirements from the client is to provide good levels of comfort, ideally without resorting to the use of mechanical cooling, to the various teaching, office and ancillary spaces in the building, this with the understanding being that many of the spaces have historically overheated during the summertime.

Most normal teaching and office areas in the URS building are currently naturally ventilated via openable windows, apart from some small scale local extracts for kitchenettes and WC facilities, and full mechanical ventilation via central plant that has been provided for the lecture theatre spaces.

There are some limited areas where the existing natural ventilation openings are able to provide effective ventilation rates and comfort, these being primarily shallow plan spaces that are well shaded and/or on the North elevation. Unfortunately however, the availability and distribution of the natural ventilation openings is in many instances quite limited and therefore ineffective at providing adequate air flowrates, with many very deep plan spaces having only single side openings provided. The façade on most elevations is highly glazed with limited external shading being provided, which results in the risk of overheating being high especially for the spaces on the Southern elevation.



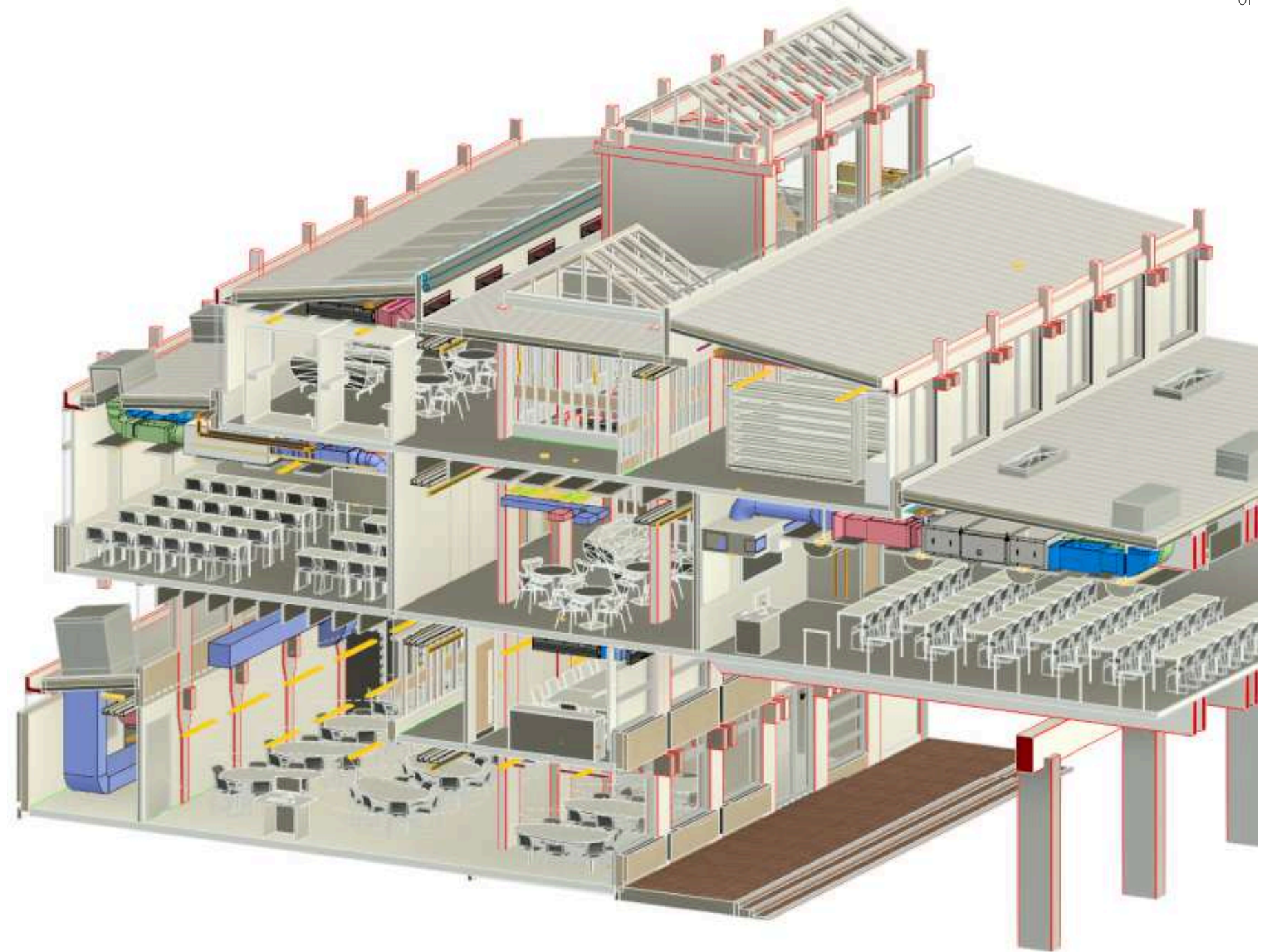
01 Cross-section displaying the proposed typical M&E services distribution in URS.

M&E

VENTILATION STRATEGY (CONT.)

For these spaces it has been confirmed, via dynamic thermal modelling of the building, that a natural ventilation strategy alone, which utilises only upgrades to the thermal performance of the existing façade, is unable to support the proposed occupancy of the building in most of the spaces without significant compromises on occupant comfort. On this basis the strategy has been to adopt a “mixed-mode” ventilation strategy. New mechanical ventilation units, with heat recovery as an energy efficiency measure, will be provided throughout most of the building, this on the basis of a decentralised approach to minimise provision needed for new distribution routes. Due to the constraints imposed by the extensive high level structure unfortunately this implies significant quantities of smaller ventilation units to achieve the required ventilation rates in each space.

Mechanical cooling will also be provided in some spaces that are more densely occupied and/or where equipment heat gains are also likely to be high, such as Lecture Theatres and Computer Labs, with central plant again being adopted for the former, with the original plant spaces and ductwork distribution routes being re-used where viable.



01 Cross-section displaying the proposed typical M&E services distribution in URS.

M&E

ELECTRICAL INFRASTRUCTURE

The URS building is currently supplied from the University's private HV network via their Blandford Substation W129 located nearby.

An initial electrical load assessment estimates the total load of the URS building in the region of 300-350kVA, and there would be sufficient spare capacity in the existing substation allocation to support this. Some modifications are proposed to the external low voltage infrastructure in order to supply the building directly from the nearby Substation, this in lieu of the existing supply which is via the switchgear in the University's Miller Building.

All the external cabling will therefore be replaced with new, this supplying the following in the building:-

- A new floor-standing LV switchboard provided within a dedicated room at ground floor level to supply most of the power requirements of the building.
- Two new evacuation lifts in the new staircores, which will be independently supplied to ensure resilience.



01 Photo of existing W129 Sub Station.



01 Photo of existing switchgear in the the Miller Building.

SERVICES INTEGRATION

OVERVIEW

The building’s servicing strategy requires a decentralised ventilation system which reduces the need to duct large quantities of air around the building which would be very impactfull on the concrete beams.

The decentralised system therefore requires localised equipment in each space. This is made up of several large MVHR units. These are located between the concrete beams, typically every other space between beams is used to house the MVHR units. Externally this introduces a ventilation cowl through the roof in each location. Ductwork, noise attenuation and the unit itself move the air to the inward side of the room where the air is combined and distributed back across the room through a low bulkhead which also frames the teaching wall in most cases.

Below the ductwork and units are suspended acoustic woodwool rafts which while providing acoustic attenuation also visually mask and break up the ventilation equipment which keeps the full depth of the beams visible. Where there is no equipment the acoustic baffles are set vertically giving maximum visibility to the beam space.

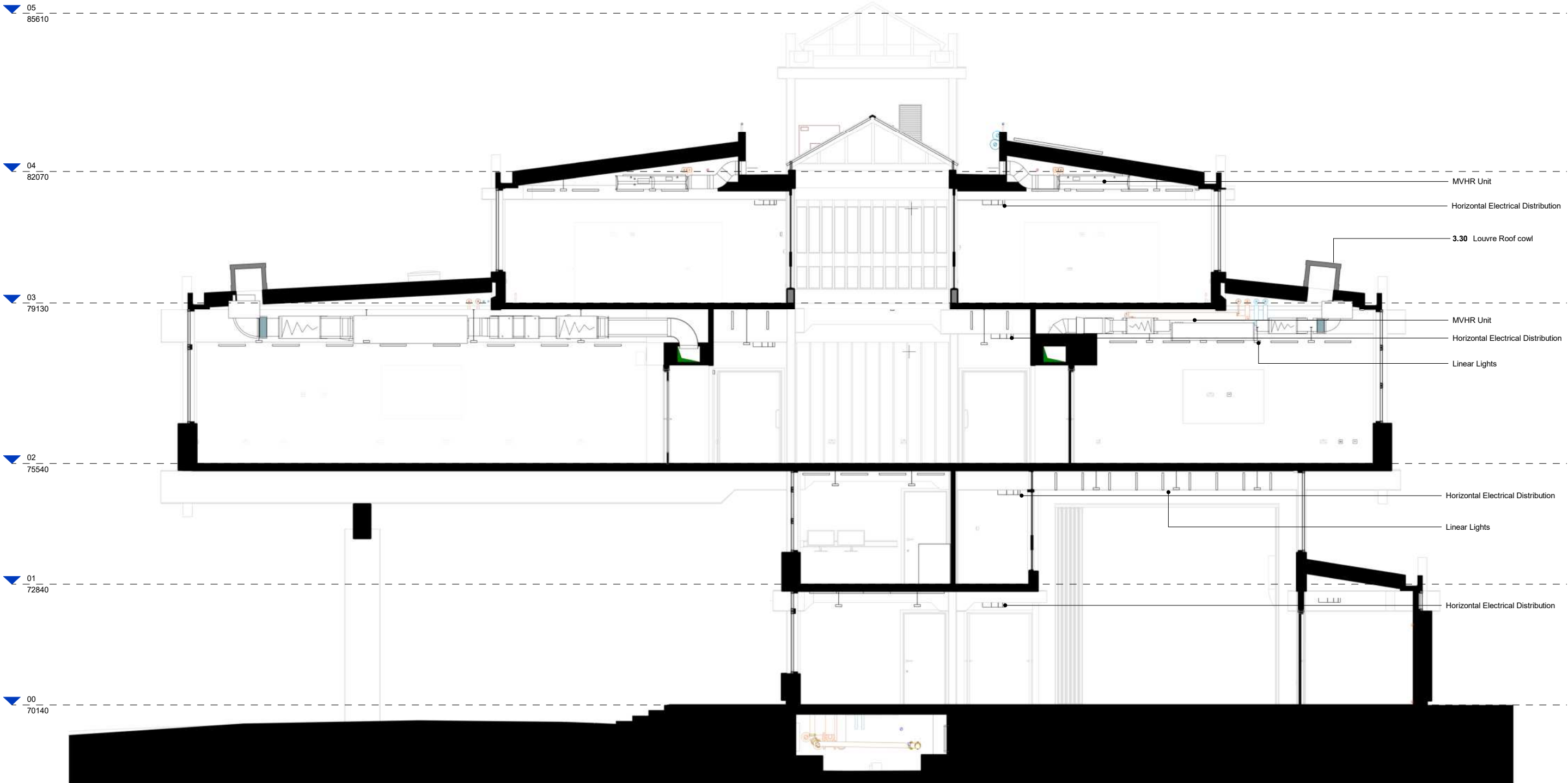
Lighting in these spaces is coordinated with the acoustic baffles and is suspended just below the ventilation equipment.

Electrical and data distribution cannot be decentralised, therefore runs along the primary circulation routes suspended below the beams within containment.



01 Proposed Typical Services Integration RCPs (nts).

SERVICES INTEGRATION



1 | 32300-Typical Section-Services Integration
1 : 50

DRAINAGE

SUMMARY

The proposals result in additional foul and surface water drainage flows. However, these additional flows are deemed to be negligible against the existing flow volumes.

Surface water attenuation is not anticipated to be required, due to the minor increase in overall impermeable area resulting from the proposals.

SURFACE WATER

The southern extension is approximately 40m² in additional impermeable area and located mostly over existing impermeable area consisting of ground floor office space and external hardstanding.

The eastern extension is approximately 35m² in additional impermeable area and located over existing permeable area consisting of soft landscaping.

The existing drainage in the vicinity of the western roof will need to be upsized locally to a 225mm pipe to suit the diameter of a new rainwater downpipe.

According to the large-scale schematic drainage drawings, the existing surface water network discharges into Whiteknights Lake. Its destination beyond this point is not currently known.

Cleaning and repair of the drainage should be undertaken by the client prior to construction to ensure the surface water drainage system continues to function adequately for the design life of the proposed works.

FOUL WATER

The internal alterations and additions to sanitary drainage are within the remit of the M&E engineer; these consist of a mixture of foul gullies, SVPs, shower gullies, and stub stacks, each with a maximum outlet diameter of 100/110mm.

Externally, a private foul drainage network drains to the west towards the downstream University of Reading foul network.

Any new foul drainage connects onto existing pipework of minimum 150mm diameter. The flattest existing 150mm diameter foul pipe is laid at approximately 1:166, giving this pipe a capacity of 11.9l/s at full bore according to the Colebrook-White equation, using a roughness factor of 1.5. Therefore this existing pipe and all other existing downstream pipework (which is either laid steeper or of a larger diameter) is deemed to contain adequate capacity for the additional foul flows.

10 CONCLUSION

AYRE
CHAMBERLAIN
GAUNT

CONCLUSION

This application for Full Planning Permission and Listed Building Consent is part of a multi phase development.

The complete renovation and retrofit proposed in this report will have a significant positive impact on the existing condition, future maintenance regime and performance of the building.

This will enable the University to bring this significant building back into active service as a vibrant hub, with much needed teaching space and a long overdue home for the CME department. As well as improving its aspect onto the mature existing landscape, it will secure its future as the Heart of the Whiteknights campus



01 Indicative visual of the proposed second floor study space.

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