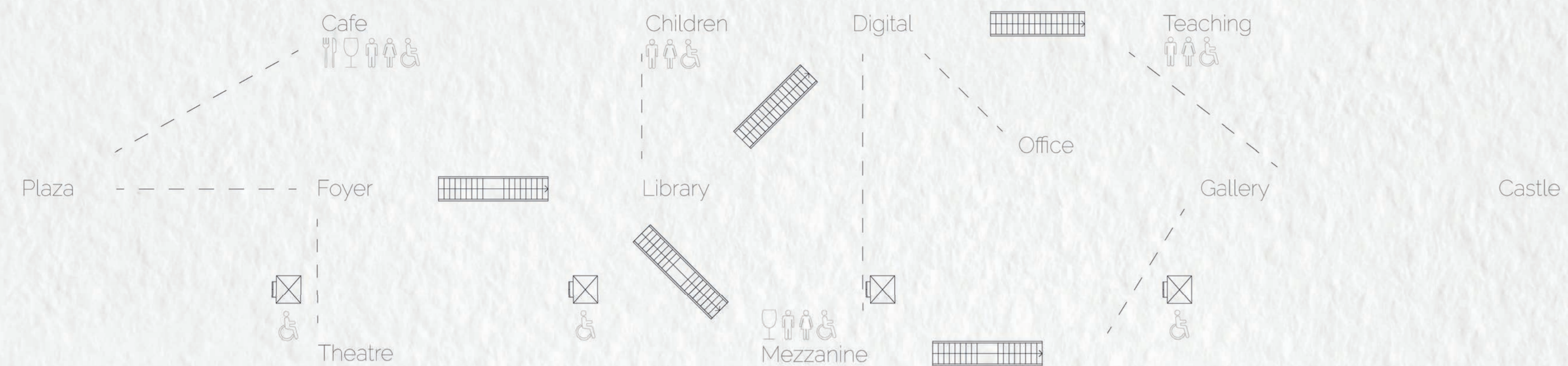




Lit

A new library and cultural centre for Hastings

Ric Hardacre | 1902195
ARCH 3B | 2022-23



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Project Statement

The project brief was to create a new library for the town of Hastings, which research revealed suffers from a lack of literacy, and various drives by the town-council to try to correct this. The response then was to create a "carrot" to compliment the council's "stick" of an education-led approach. The project therefore had to be prominently placed, inspirational and aspirational, it achieves these goals in a number of ways.

Firstly the location was chosen to take advantage of a derelict site immediately adjacent to the railway station, in the middle of an existing regeneration scheme to create a new Academic Quarter. The building sits within the connections between East Sussex College, the University of Brighton satellite campus, and the site of the proposed new "Tech Campus" on Priory Street, which is destined to be pedestrianised to improve connections between the station and the seafront.

Secondly the building itself takes a bold approach to its construction, utilising a modern-stone-age approach to create a structural frame from the local sandstone, vastly reducing embedded carbon, as well as the energy required to regulate the building's temperature. The main library itself is a separate volume, constructed of glass and steel and dramatically intersecting the building. Another glass and steel box lays lazily across the roof, containing a new exhibition and event space which aims directly at Hastings Castle.

Finally the interior of the building is designed around connecting varying parts of the programme, with flying staircases, bridges, multiple routes and places to explore. A day out for the family, a place to study and learn, a place to fall in love with an old book for the second time, a place to meet, and a place to eat, drink, and relax. Its name is Lit - an abbreviation of literature, a byword for cool or exciting, and a beacon that summons curious minds.



2100h
21st June
10over

Site details



Proposed site for new multistorey car park

East Sussex College (2010)

Railway Station (1931)
Extended 2004

Old Sorting Office (1883)
Scheduled for demolition
Proposed site for new bus station

Proposed site Boundary

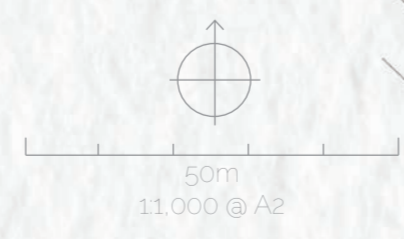
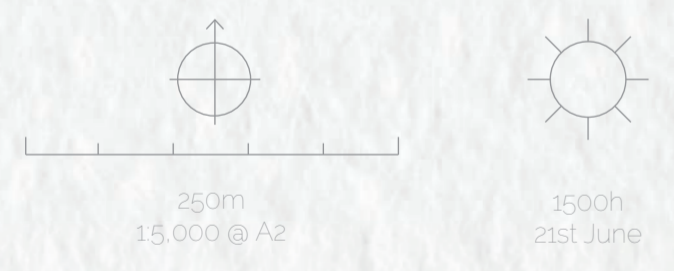
Queensbury House (1960s)
Recently Demolished

Hastings Pier (1872)
Refurbished 2016
Grade II listed

Priory Street Multistorey Car Park (1969)
Scheduled for demolition
Site of new "Tech Campus"

Priory Square
University of Brighton, Hastings Campus

The Brassey Institute (1878)
Existing Library
Grade II Listed



v1 - Station Plaza



v2 - Queensbury House

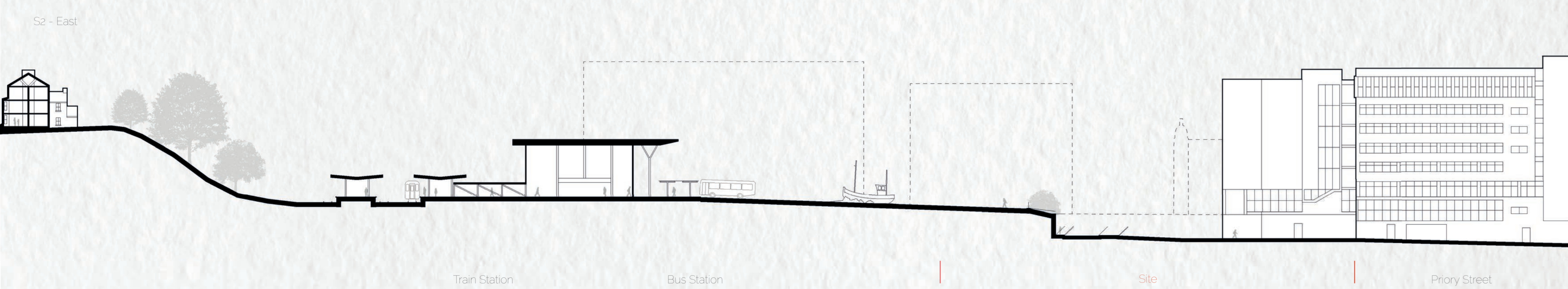
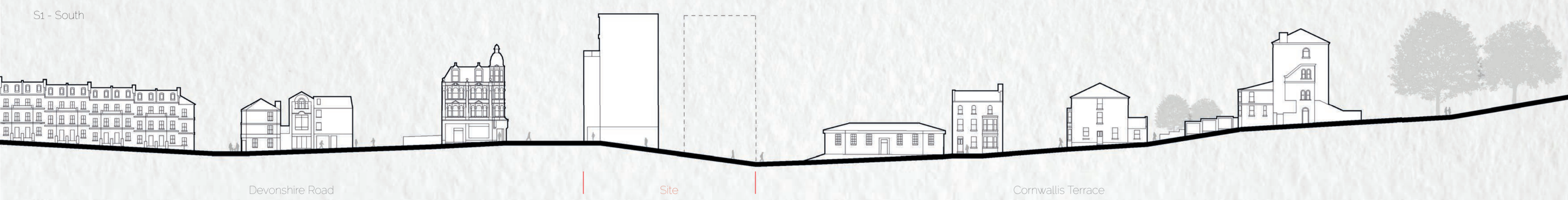


v3 - Cornwallis Terrace



v4 - Priory Street

Site Sections



25m
1:500 @ A2
6 - Ric Hardacre - ARCH3B

(Missing) Pedestrian Links



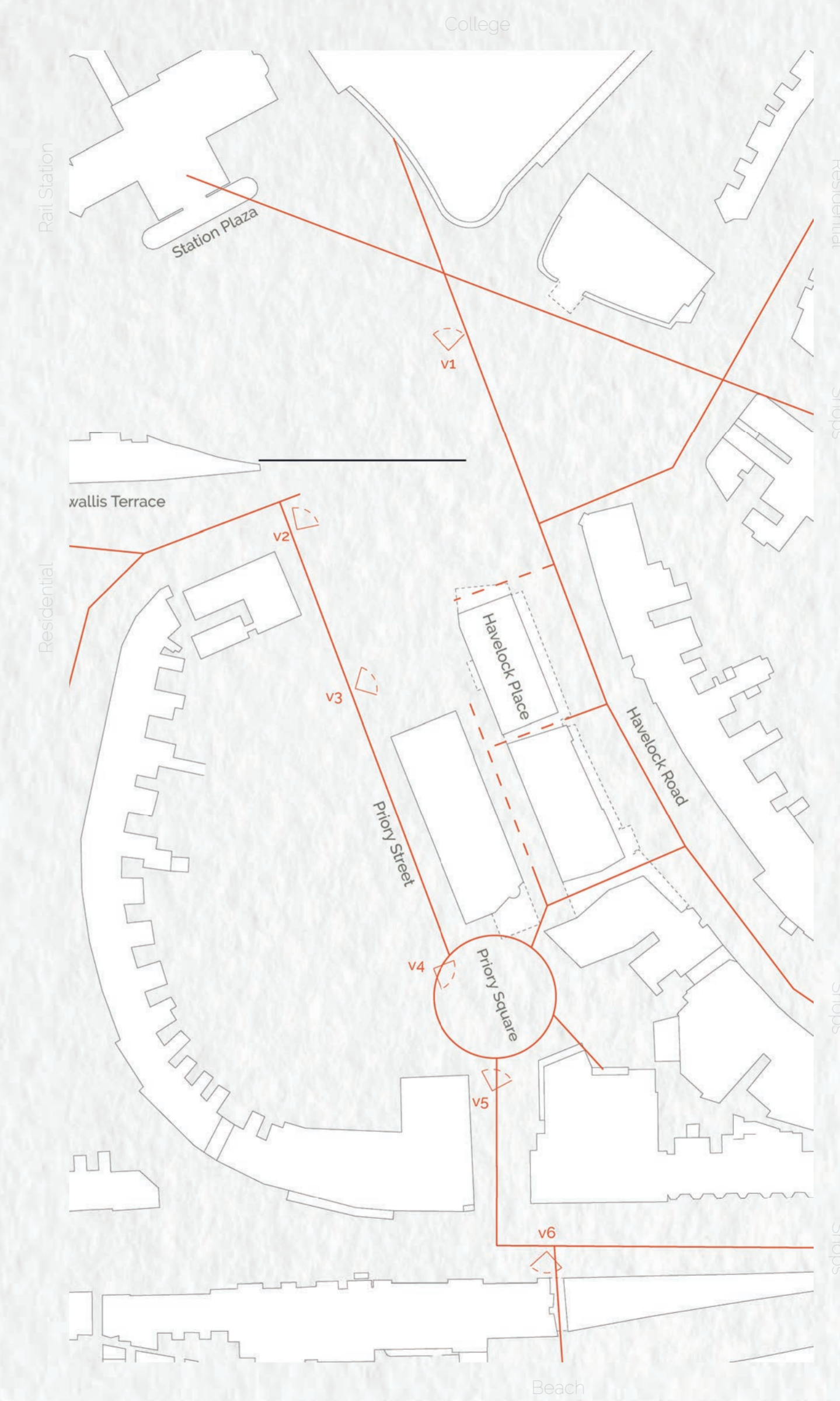
v1 - Desire line between college and Havelock Rd



v3 - Rear of Havelock Place, abrupt drops



v5 - Priory Square, cut-through fenced off



v2 - Retaining wall between Station Plaza and Priory St



v4 - Priory Square



v6 - Link to Trinity Street

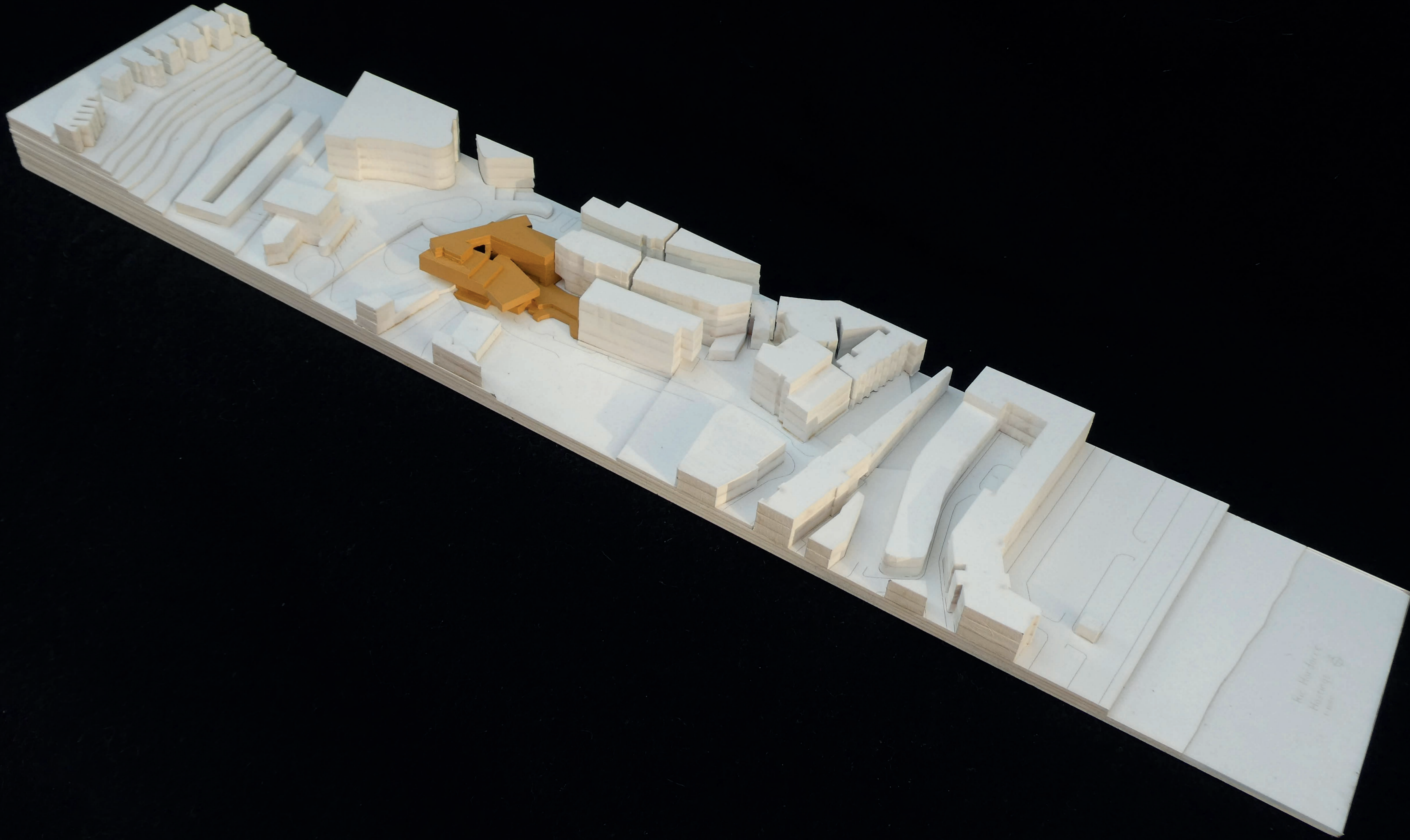
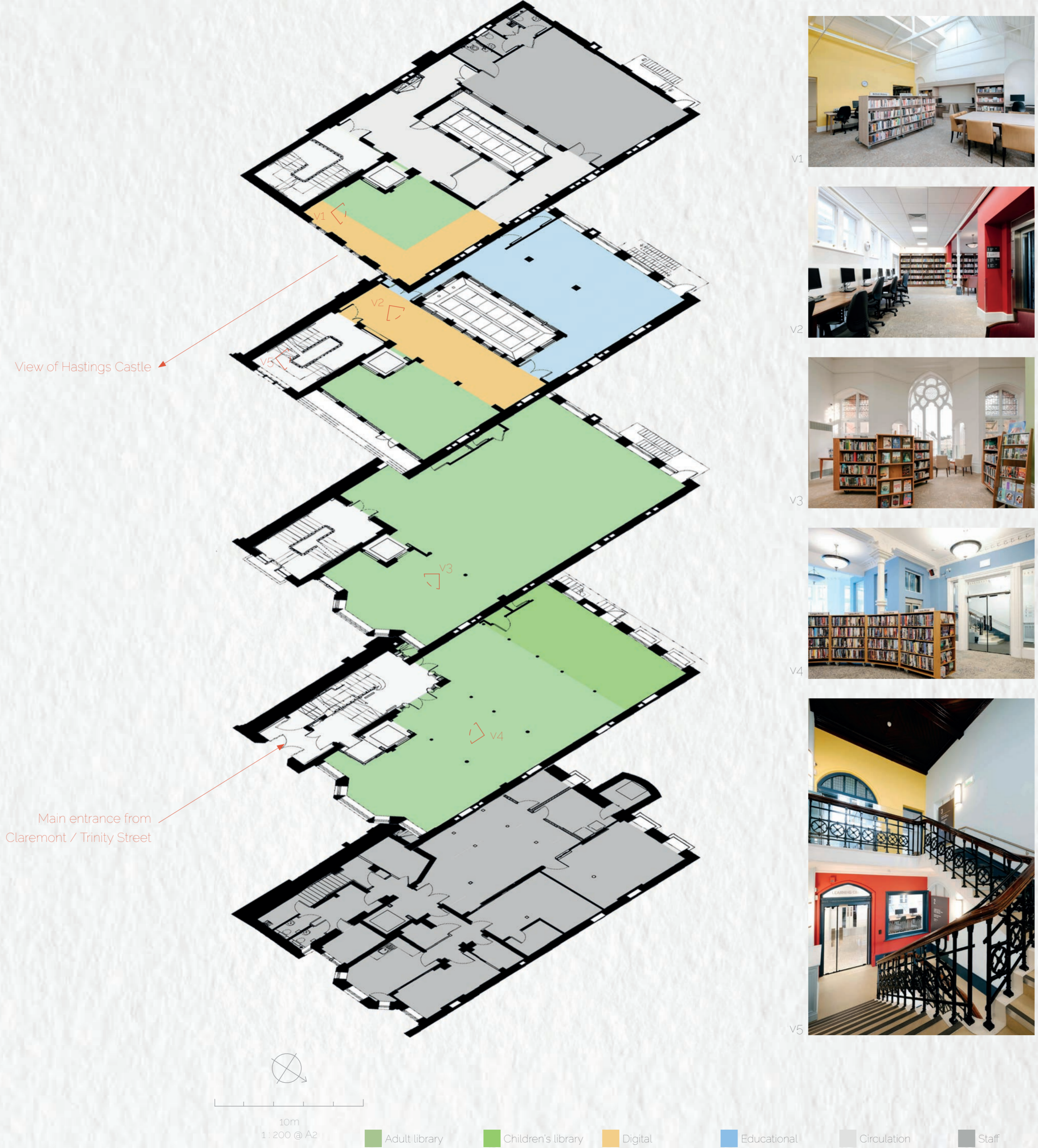
Hastings' Library



Hastings Library has resided in the grade II listed Brassey Institute almost since the building opened in 1878. It is located in a side-street with west-facing windows, which offer a view of the castle, but let in little light. The entire building is around 1000m² including circulation and staff spaces, the majority of the latter being in the basement. It has been refurbished numerous times, most recently in 2016 - when a pastel colour palette was introduced. As well as the collection of books this colour scheme, the view of the castle, and the large open staircase running the full height of one corner of the building are incorporated into this proposal.

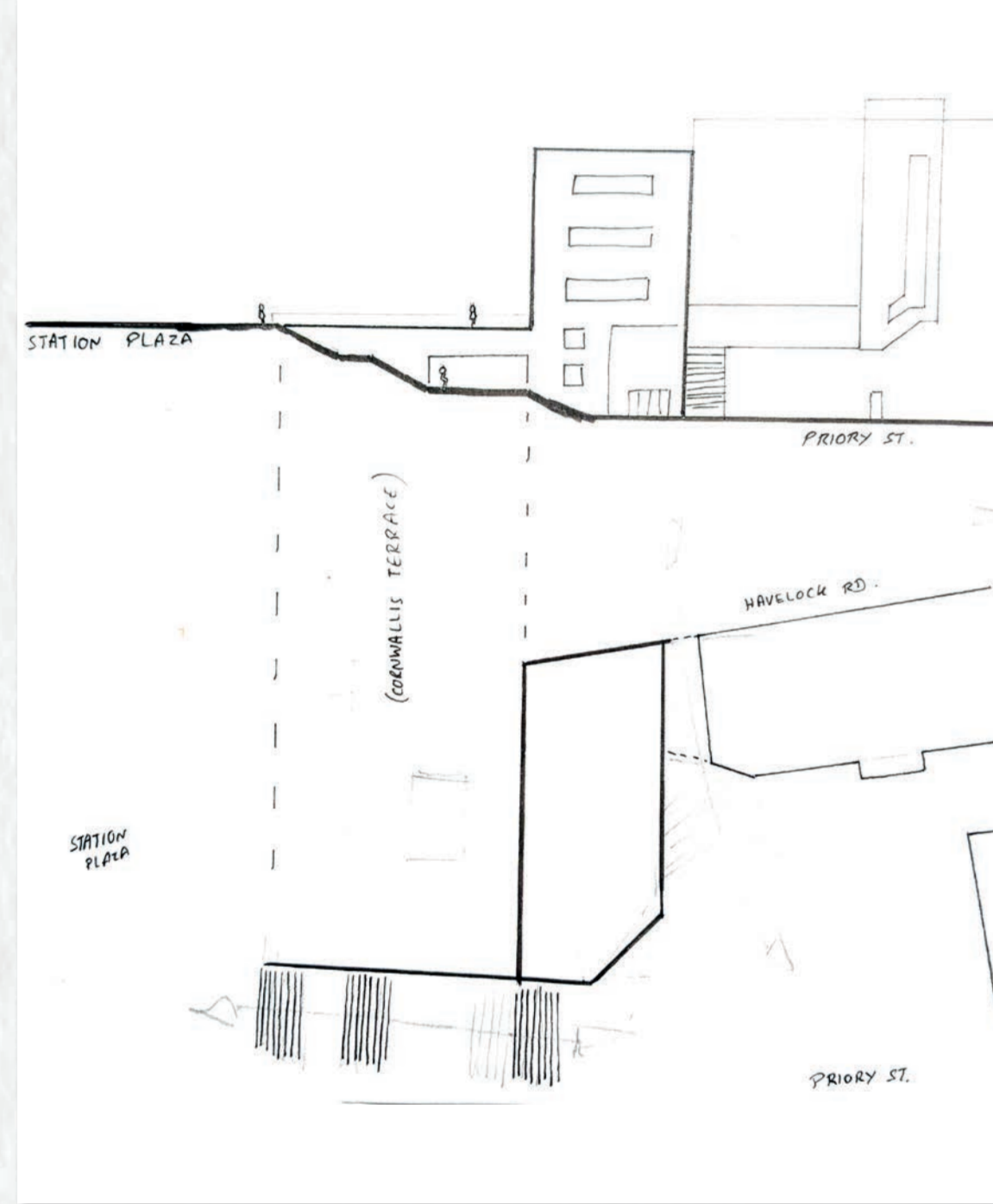
106,000 visitors per annum

84,000 items borrowed each year

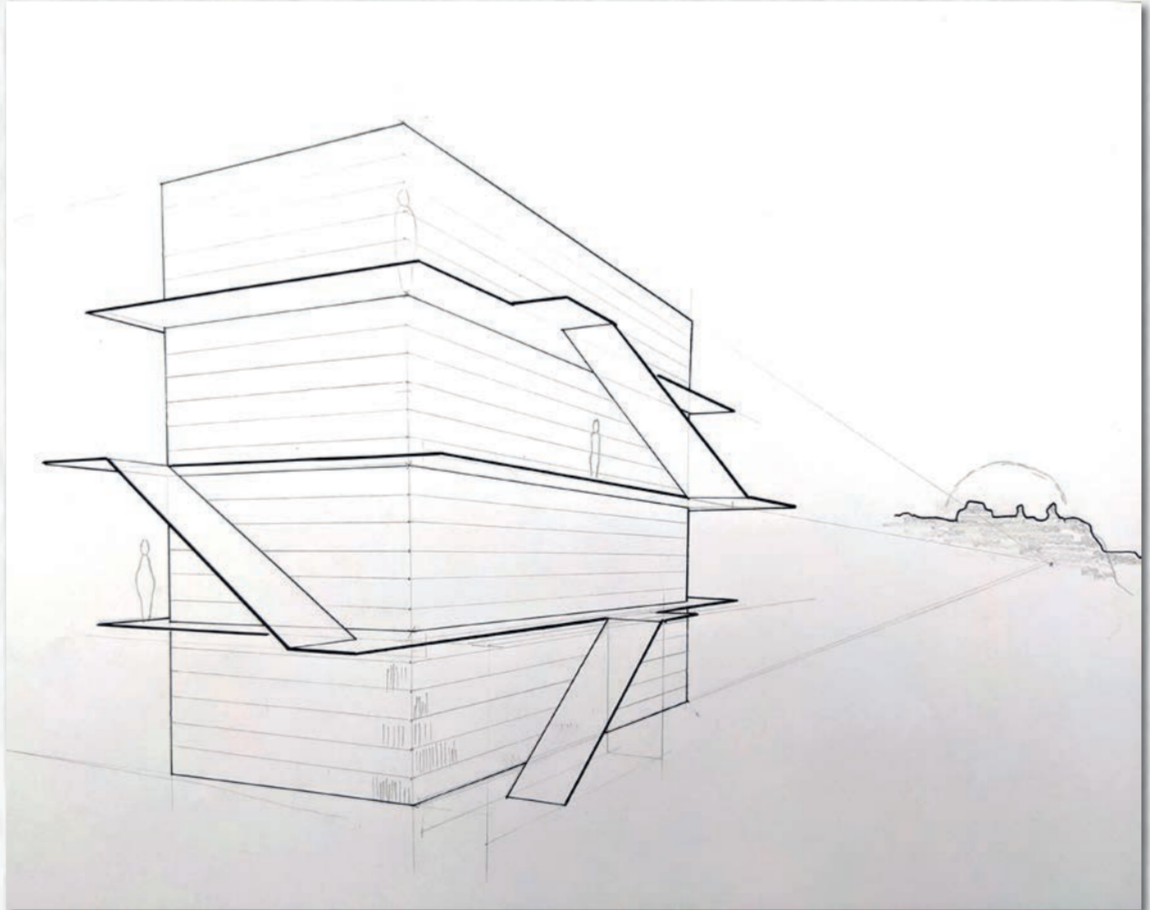
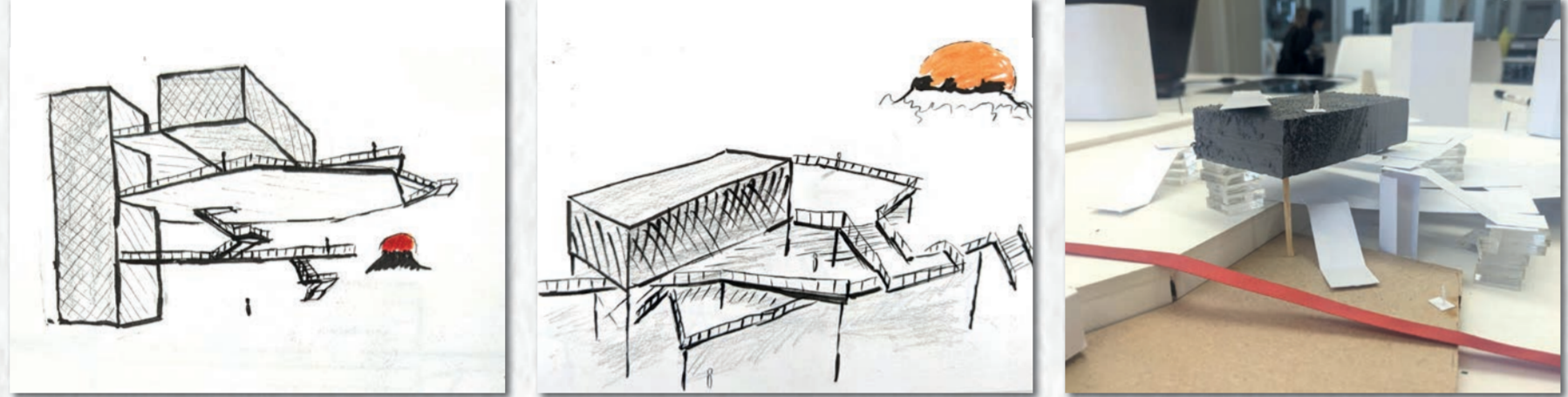


Design Report

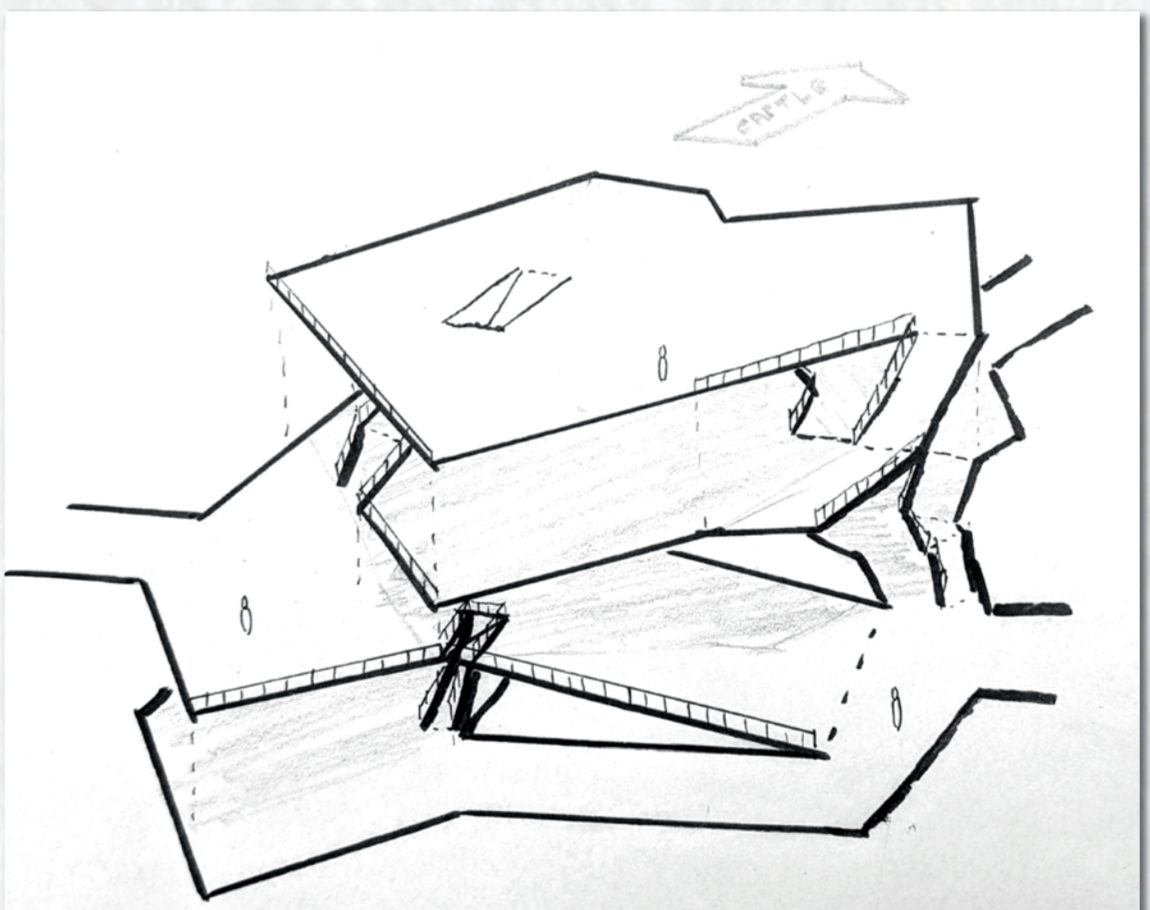
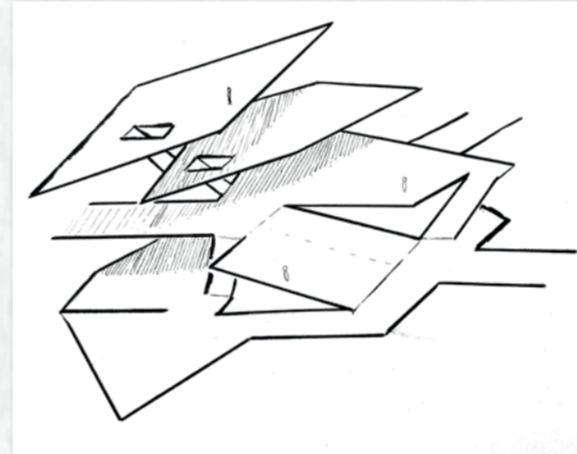
Concept Development



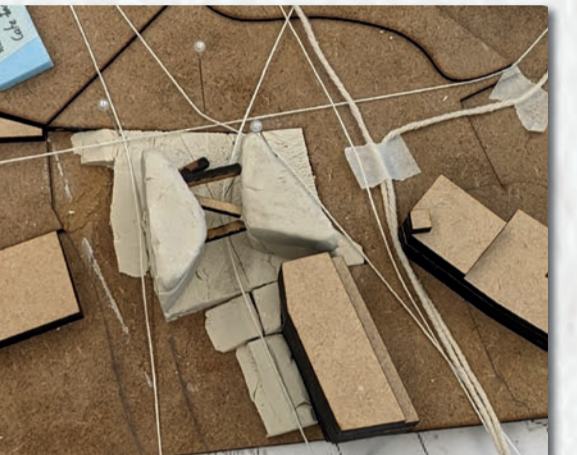
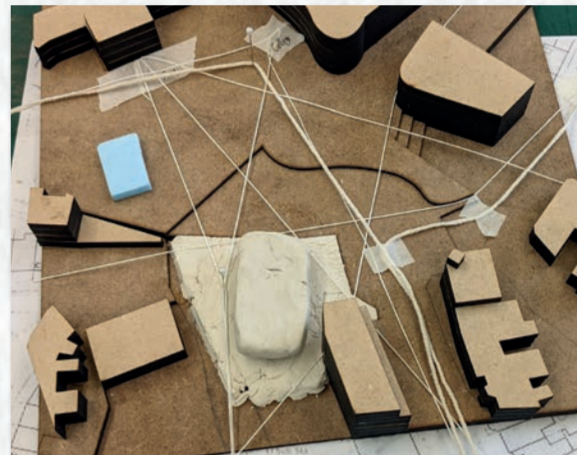
Initial response, reclaim Cornwallis Terrace. The building fronts onto and becomes part of a new plaza, incorporating a pedestrian link to Priory Street.



Conceptualising the library as an existing artifact that people come to and build structures around over many centuries, aligned with, and interacting with Hastings Castle.

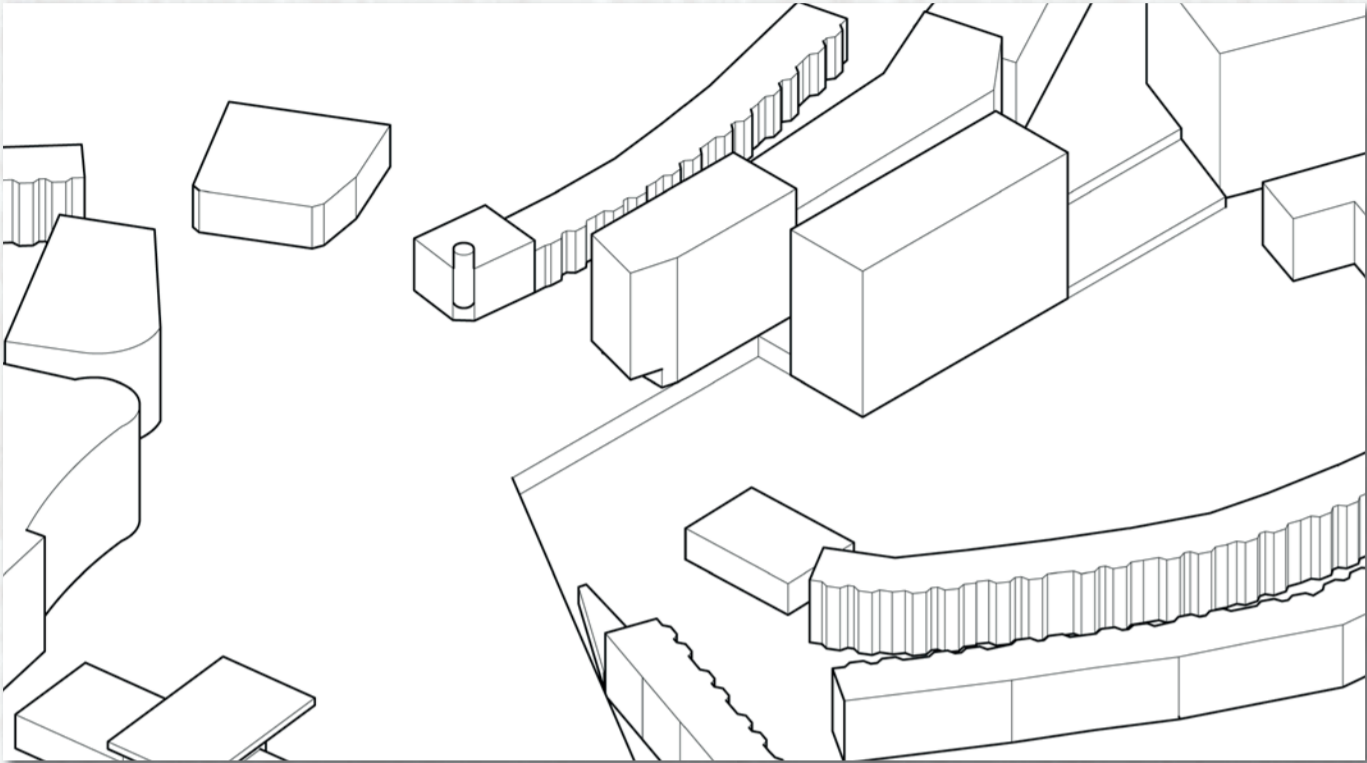


Taking the desire lines and connections created by people and bringing them into the building, allowing the horizontal and vertical connections to form organically.

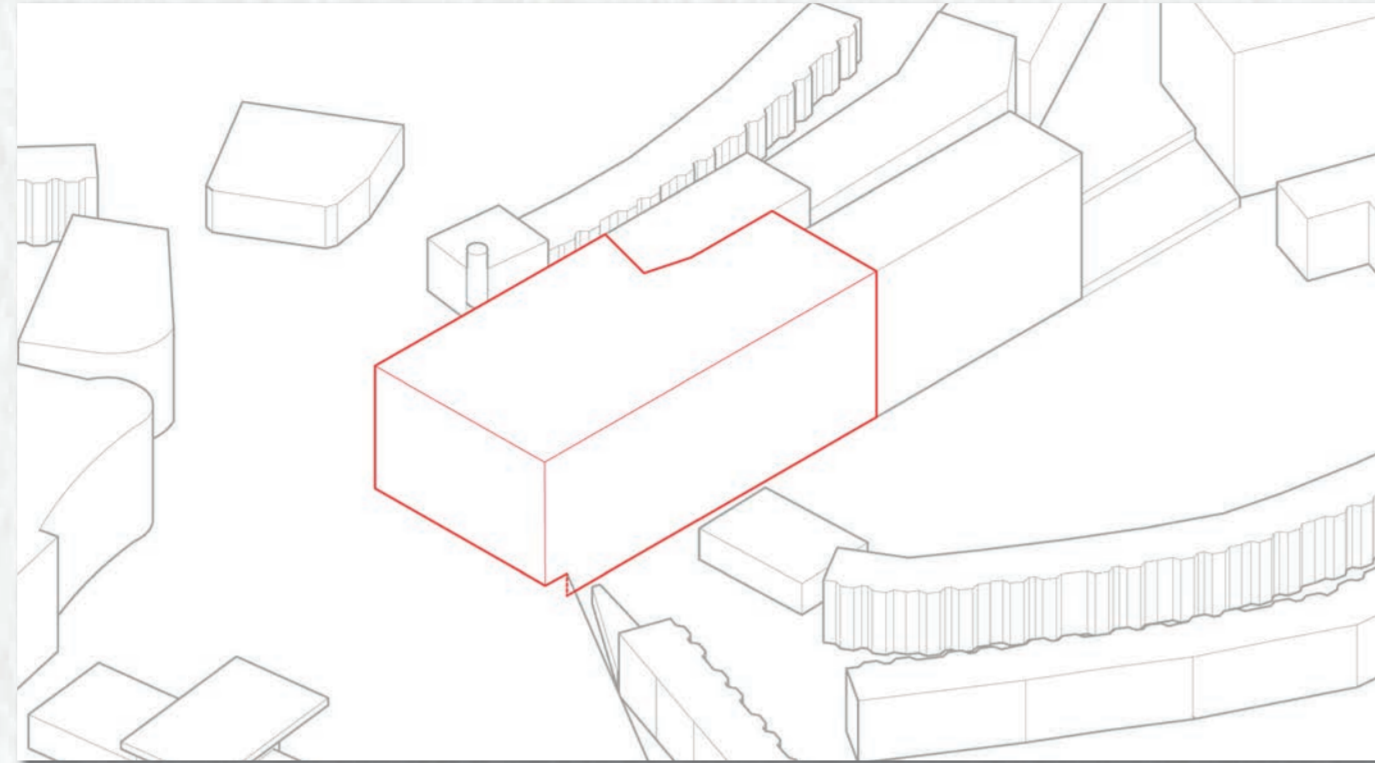


Studying how the exterior form of the building is also formed by the carving actions of people as they move around the urban environment.

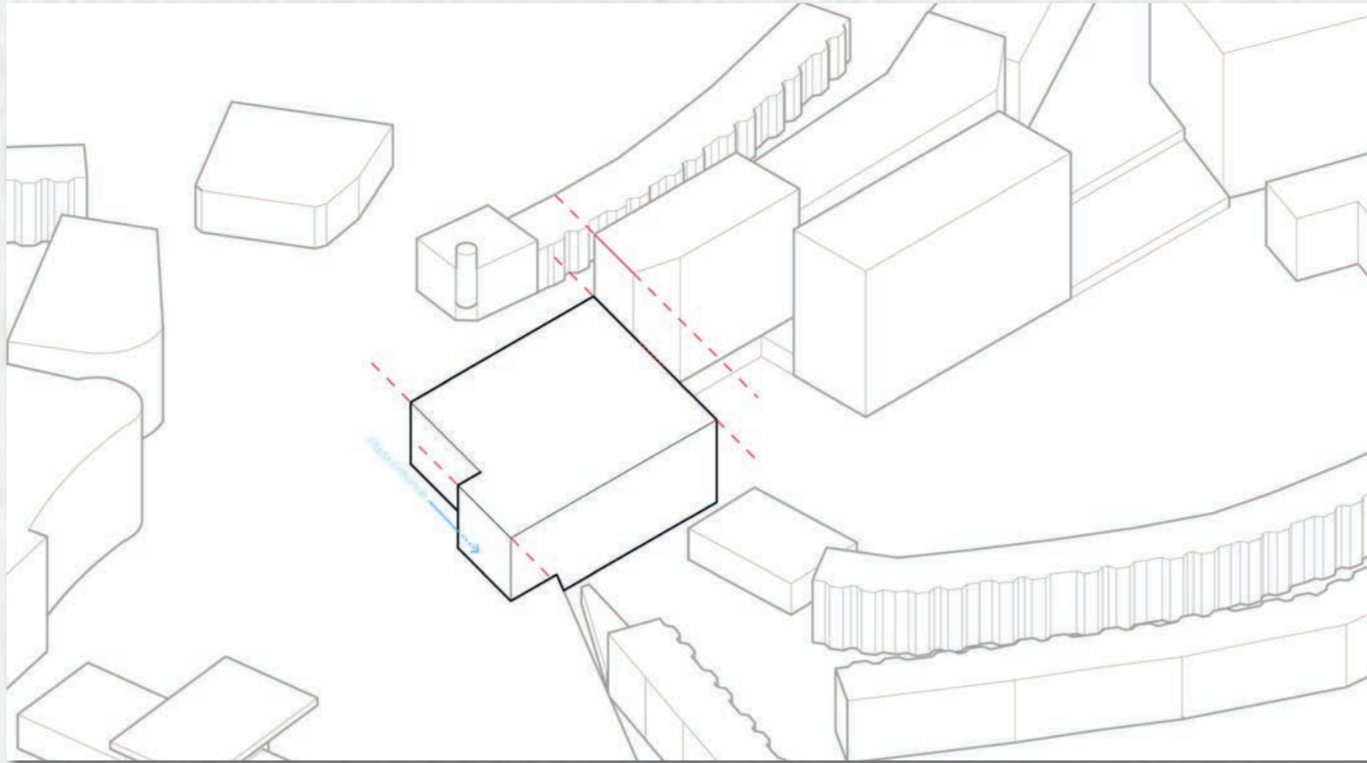
Urban Response



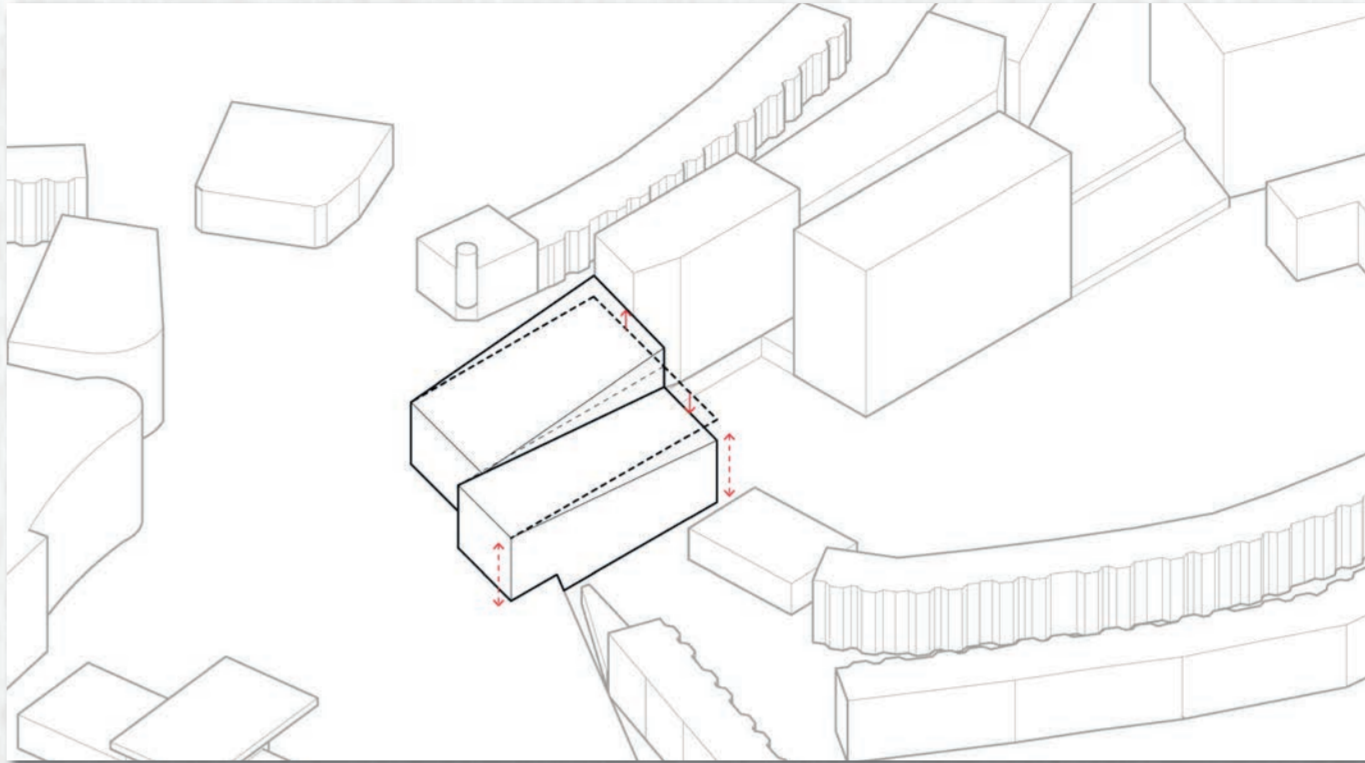
1 - Site, cleared and excavated



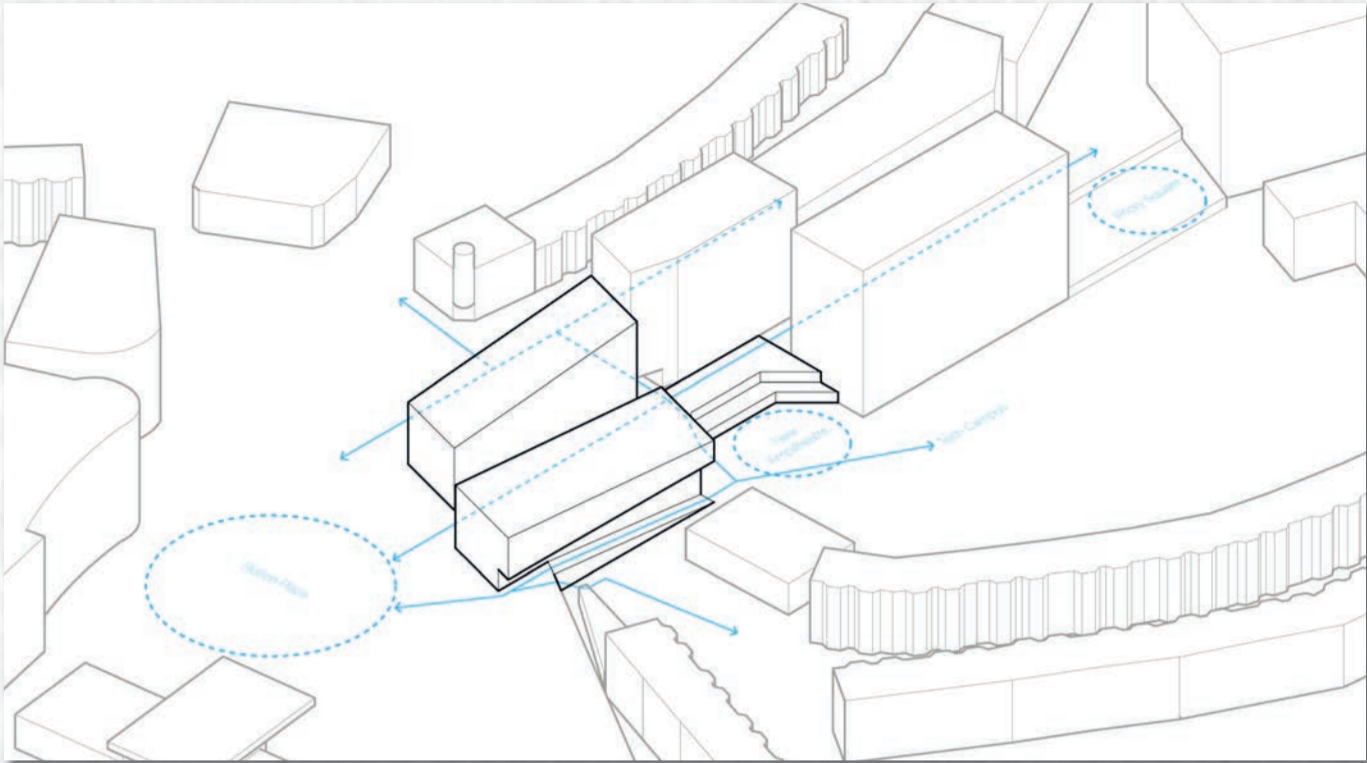
2 - Maximum extents



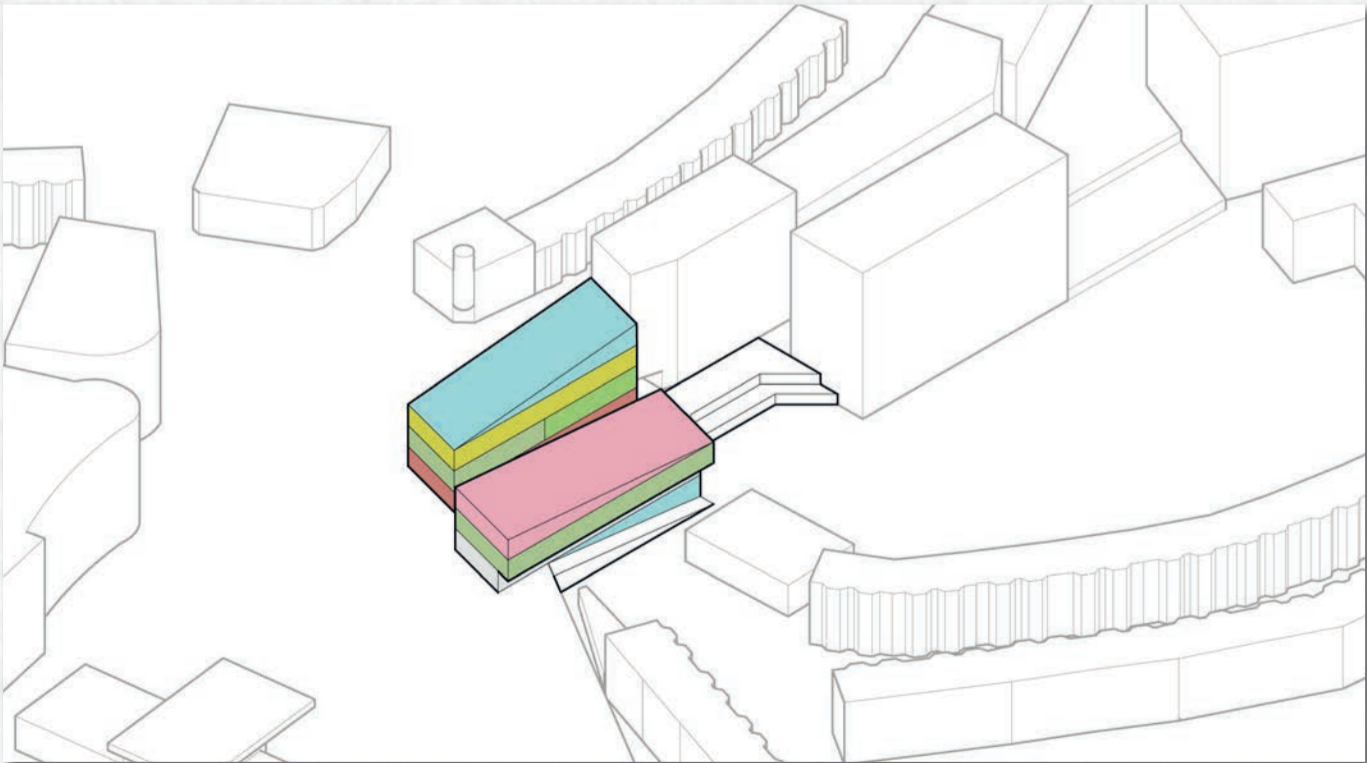
3 - Reduce to appropriate scale. Align with urban fabric



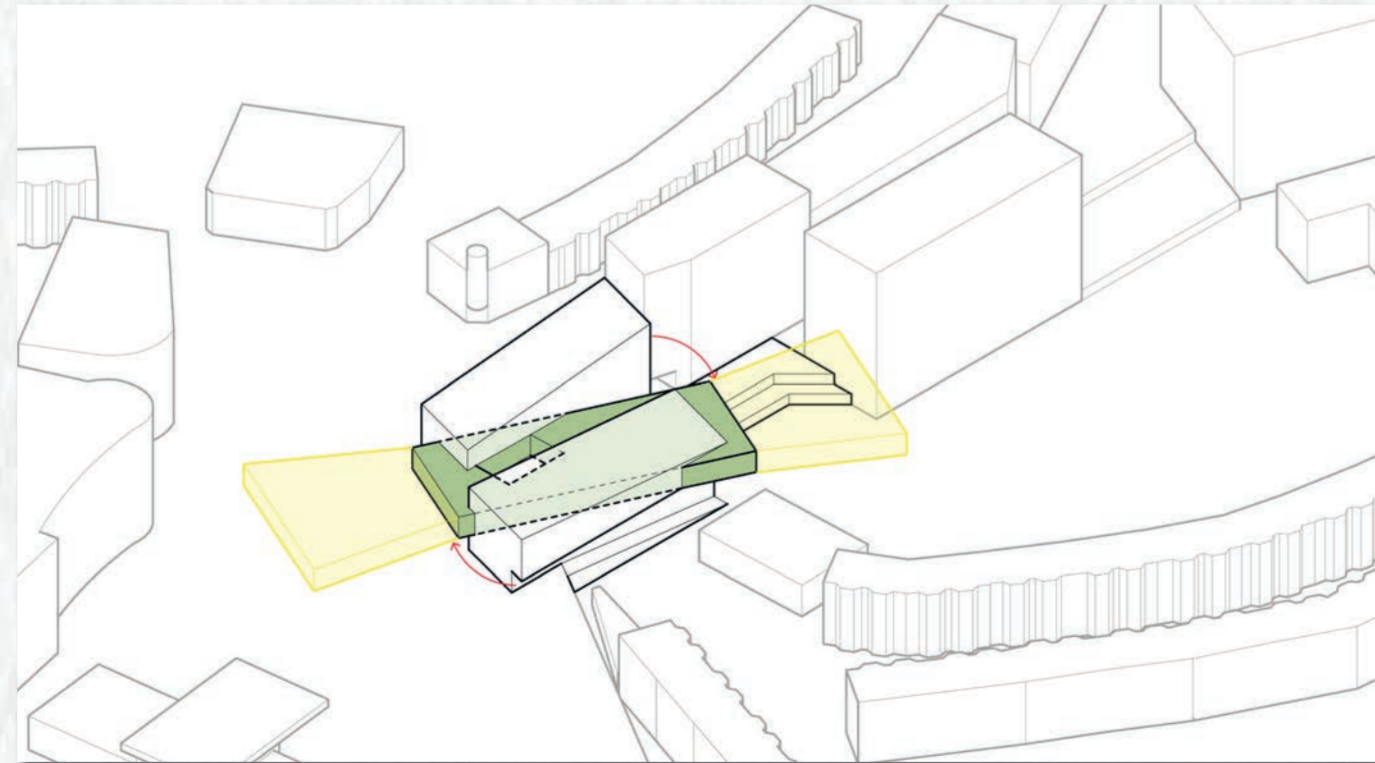
4 - Raise west roof line to reach up to Havelock Place. Lower east roof to follow ground line.



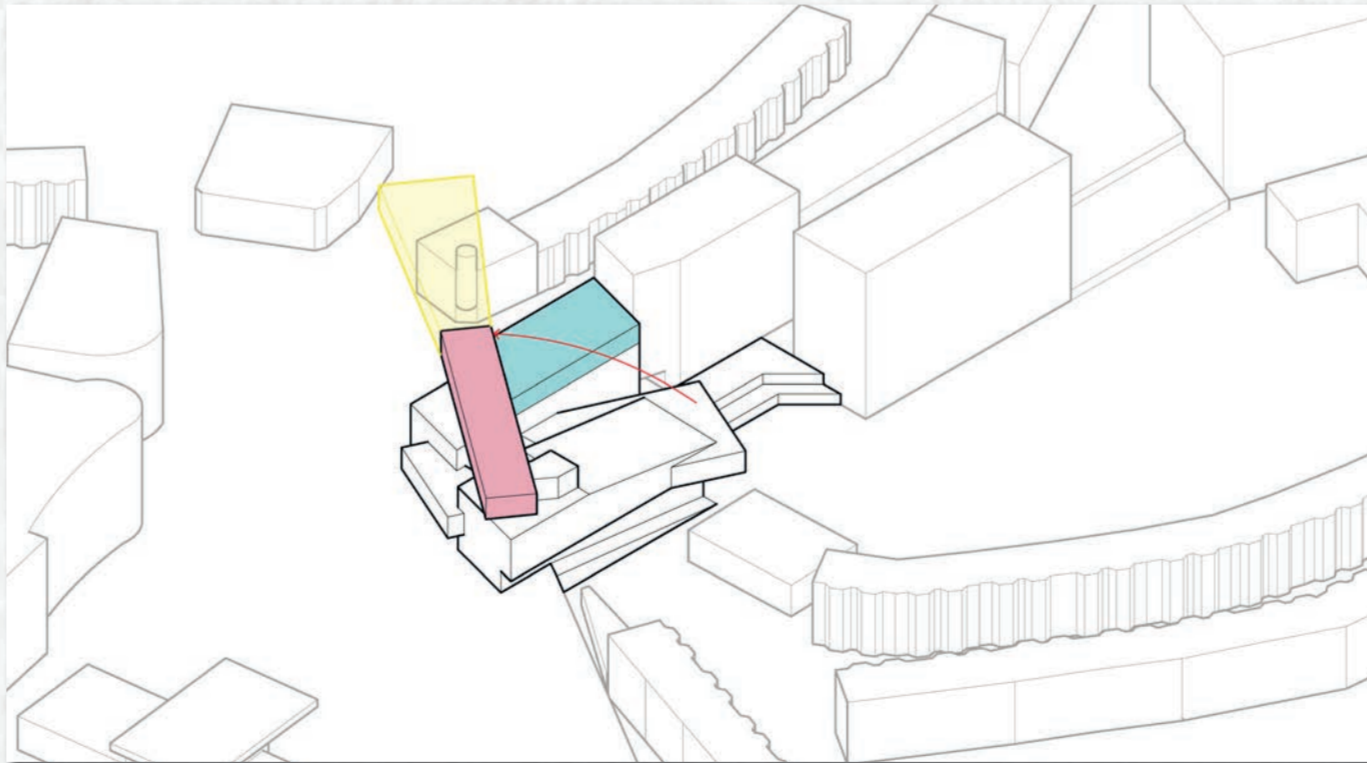
5 - Carve to accommodate pedestrian links. Incorporate new amphitheatre space



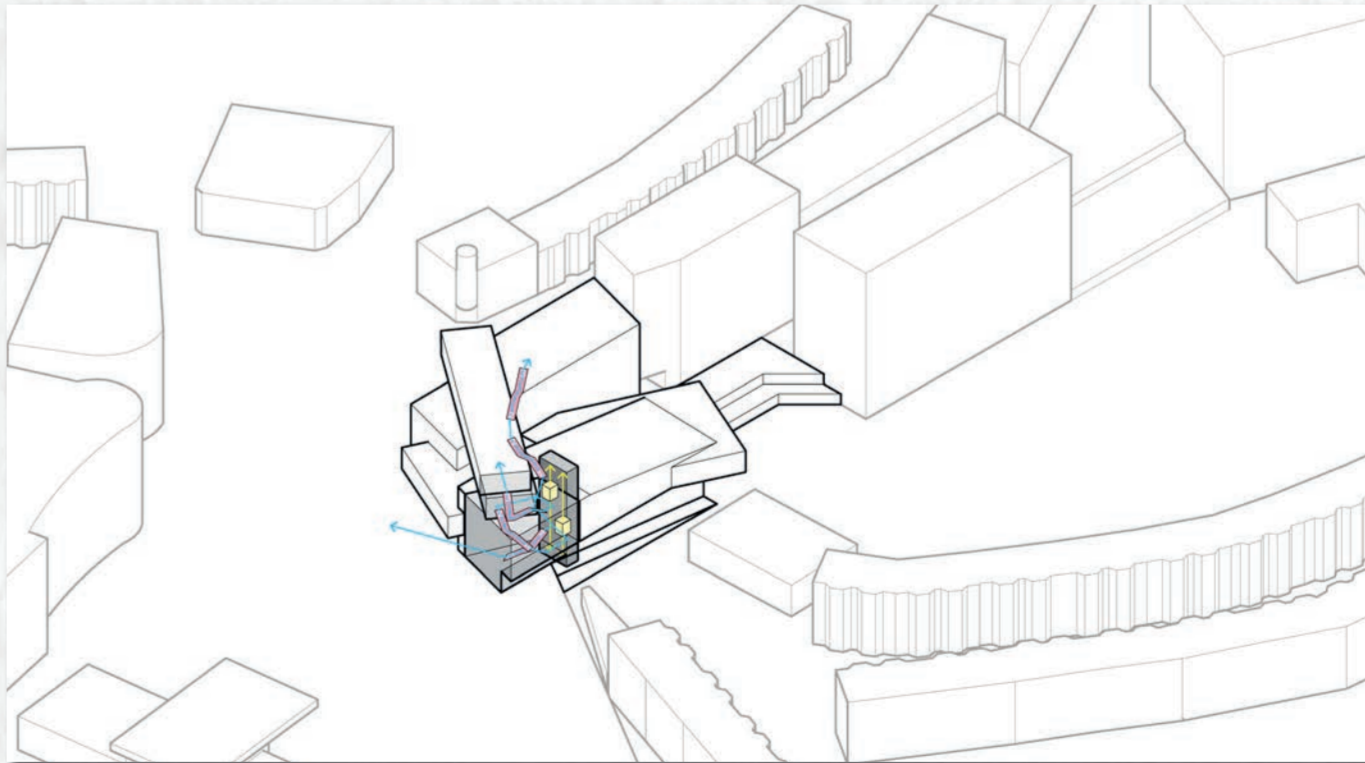
6 - Initial programme distribution.



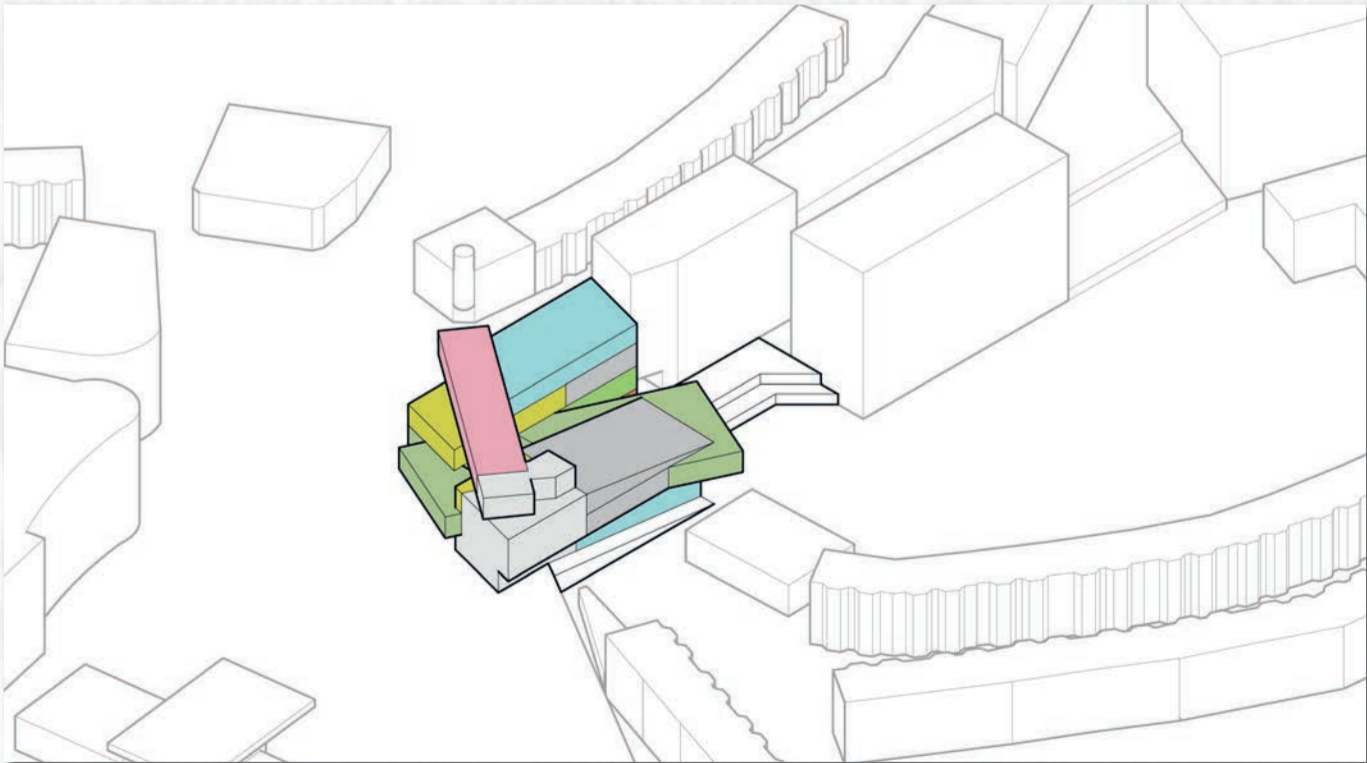
7 - Create 1000m2 library 'box'. Align to create views out over plaza and new campus



8 - Align gallery space to create view of Hastings Castle



9 - Internal vertical connections.

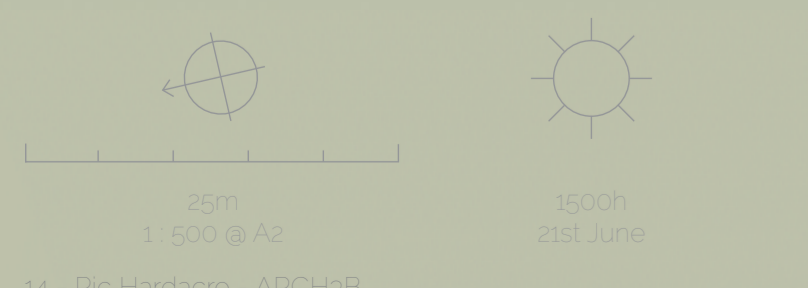
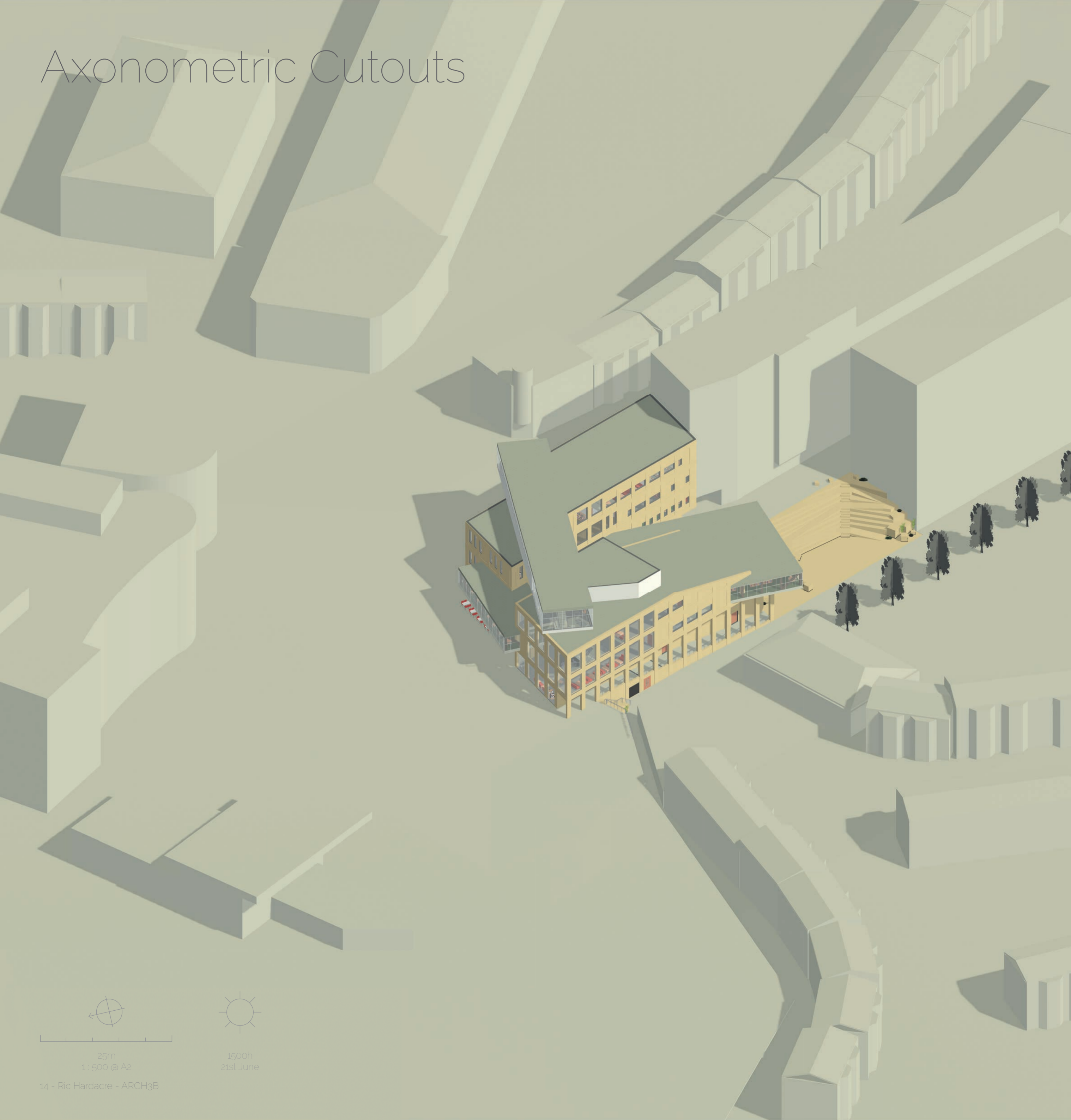


10 - Revised programme distribution.

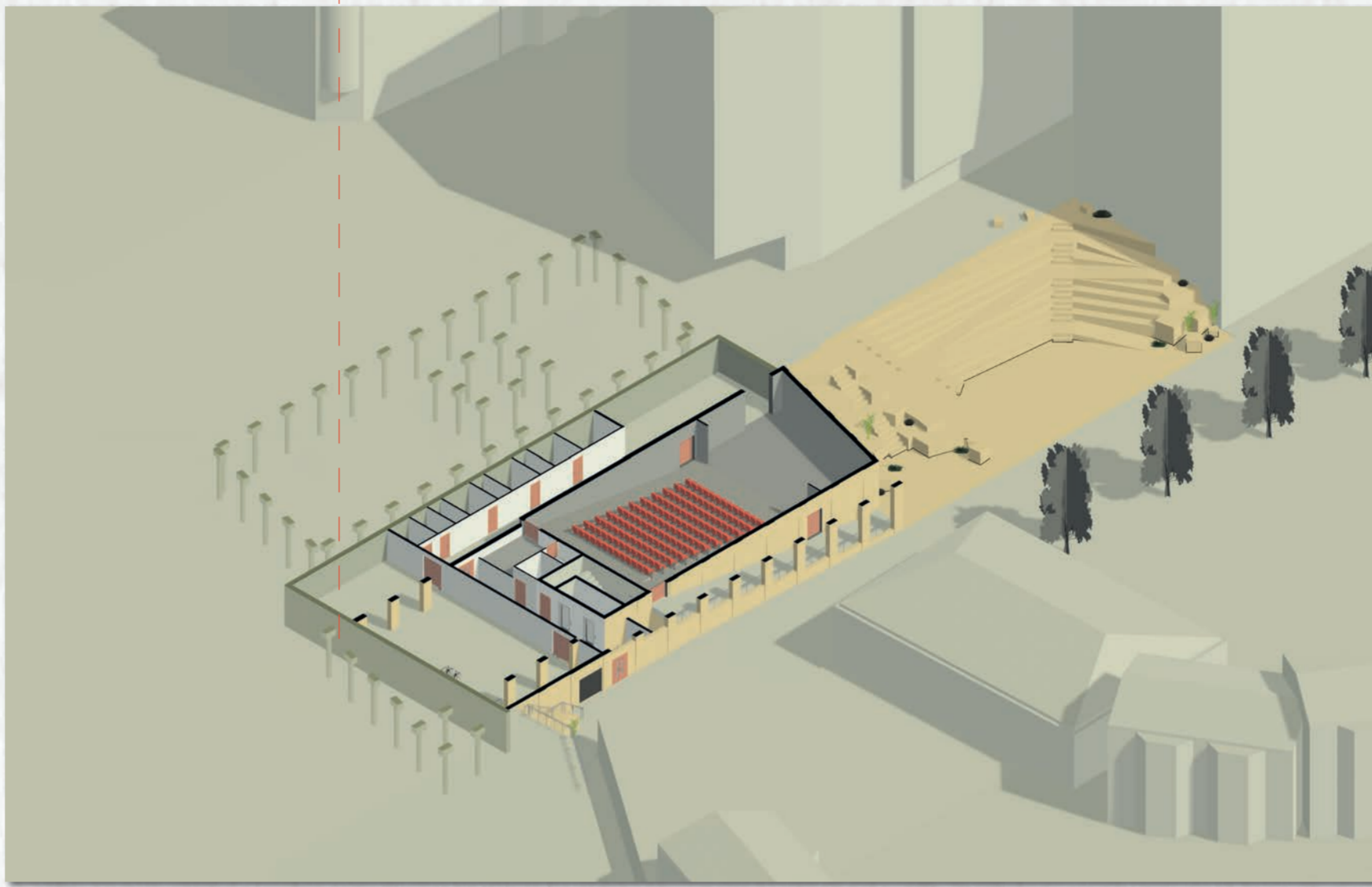
■ Adult library
 ■ Children's library
 ■ Digital library
 ■ Educational
 ■ Exhibitional
 ■ Circulation
 ■ Staff areas



Axonometric Cutouts

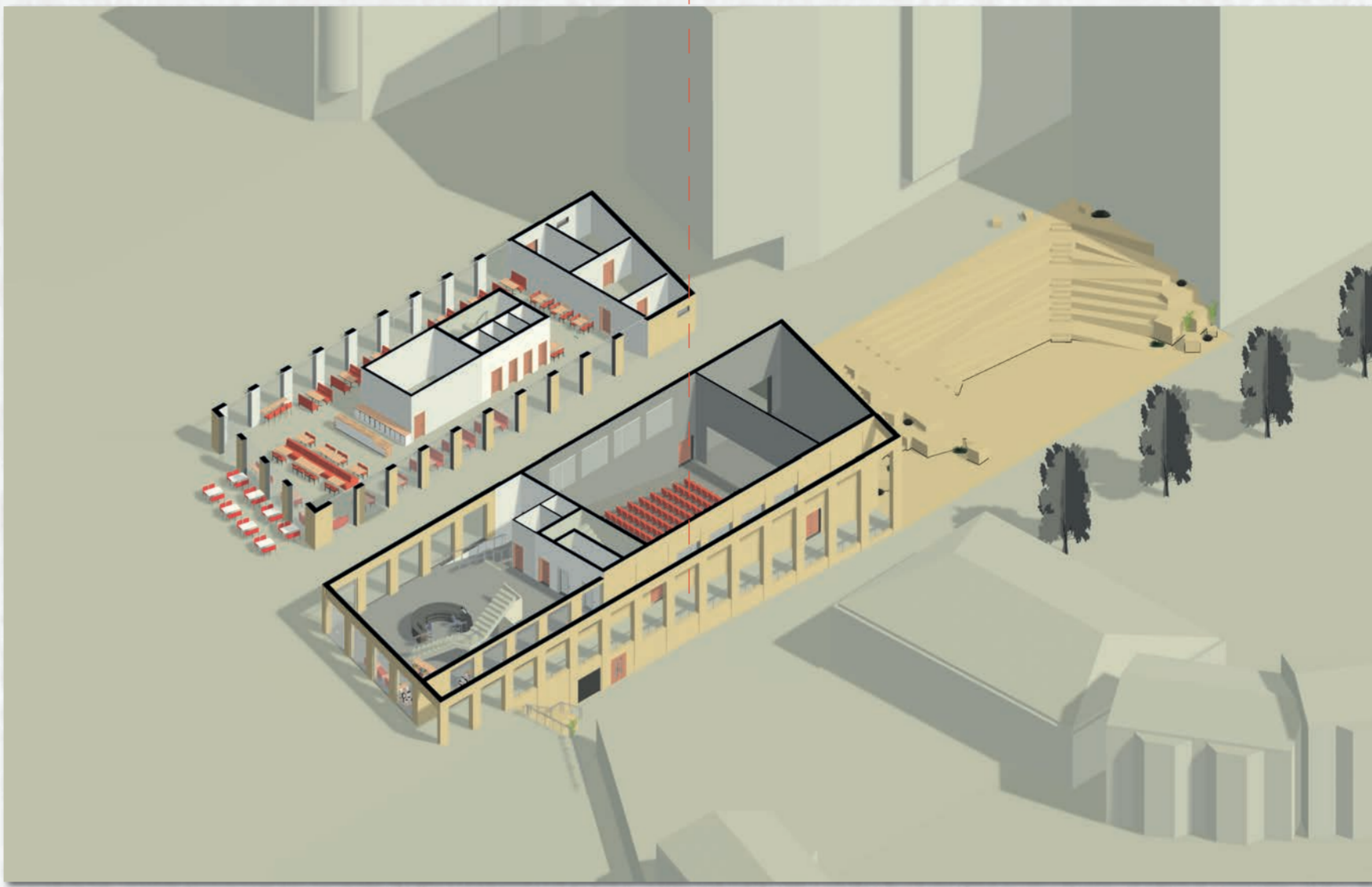


The design of the foundations and retaining-wall will depend on the ground conditions and the engineer's calculations.



Lower-ground floor, level with Priory Street - Staff areas, storage and theatre back-of-house.

A colonnaded ramp links Priory Street and the Station Plaza.



Ground floor, level with the Station Plaza - Restaurant, theatre entrance, and reception, which incorporates the town box-office and tourist information.

The steel-and-glass "Library Box" structure is clearly visible here.



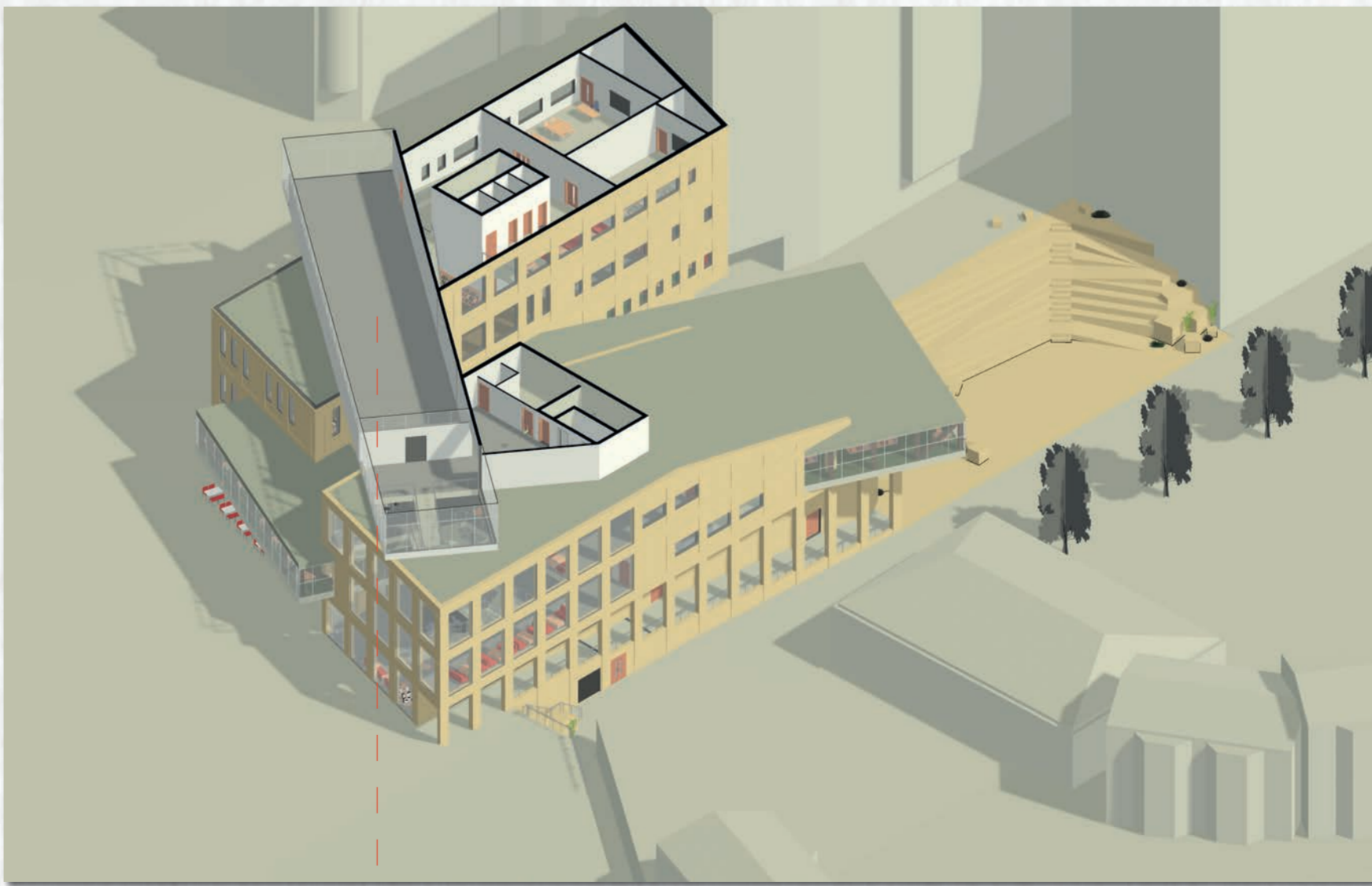
First floor - Main library, and children's library.

Circulation routes bridge the buildings and offer views out, and of the movement inside.



Second floor - Digital library, mezzanine function area, toilets, and staff offices.

The gallery sits across the two buildings, as if playfully left there after the fact.



Third floor - Gallery, and teaching spaces.

Elevations



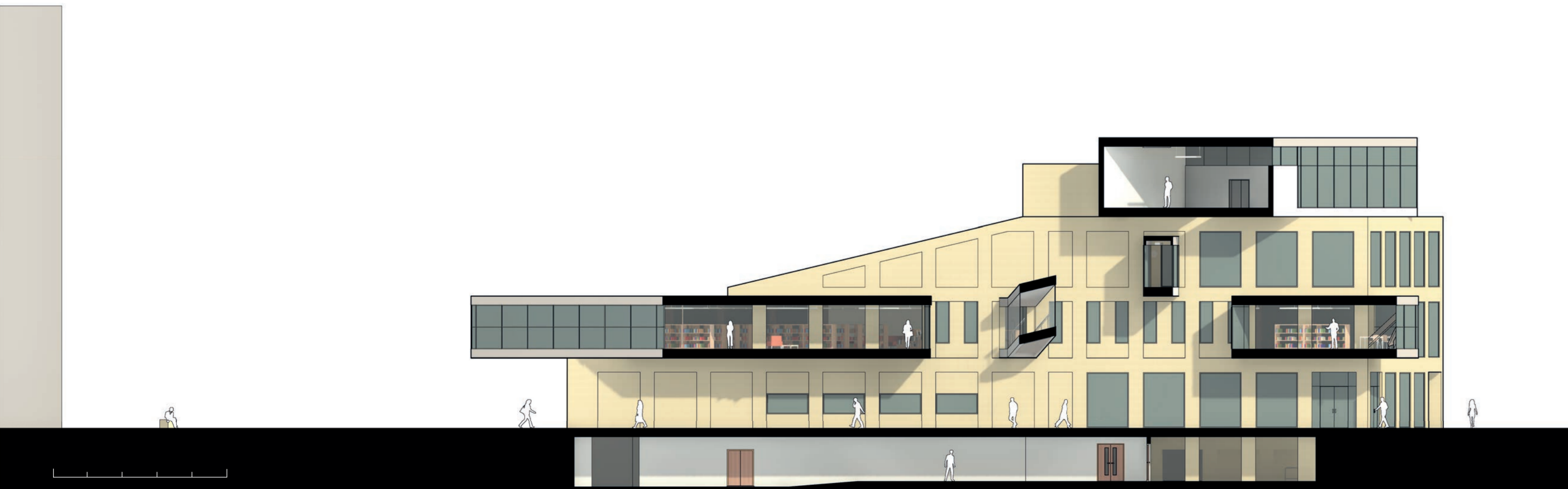
e1 - East elevation. Havelock Road.



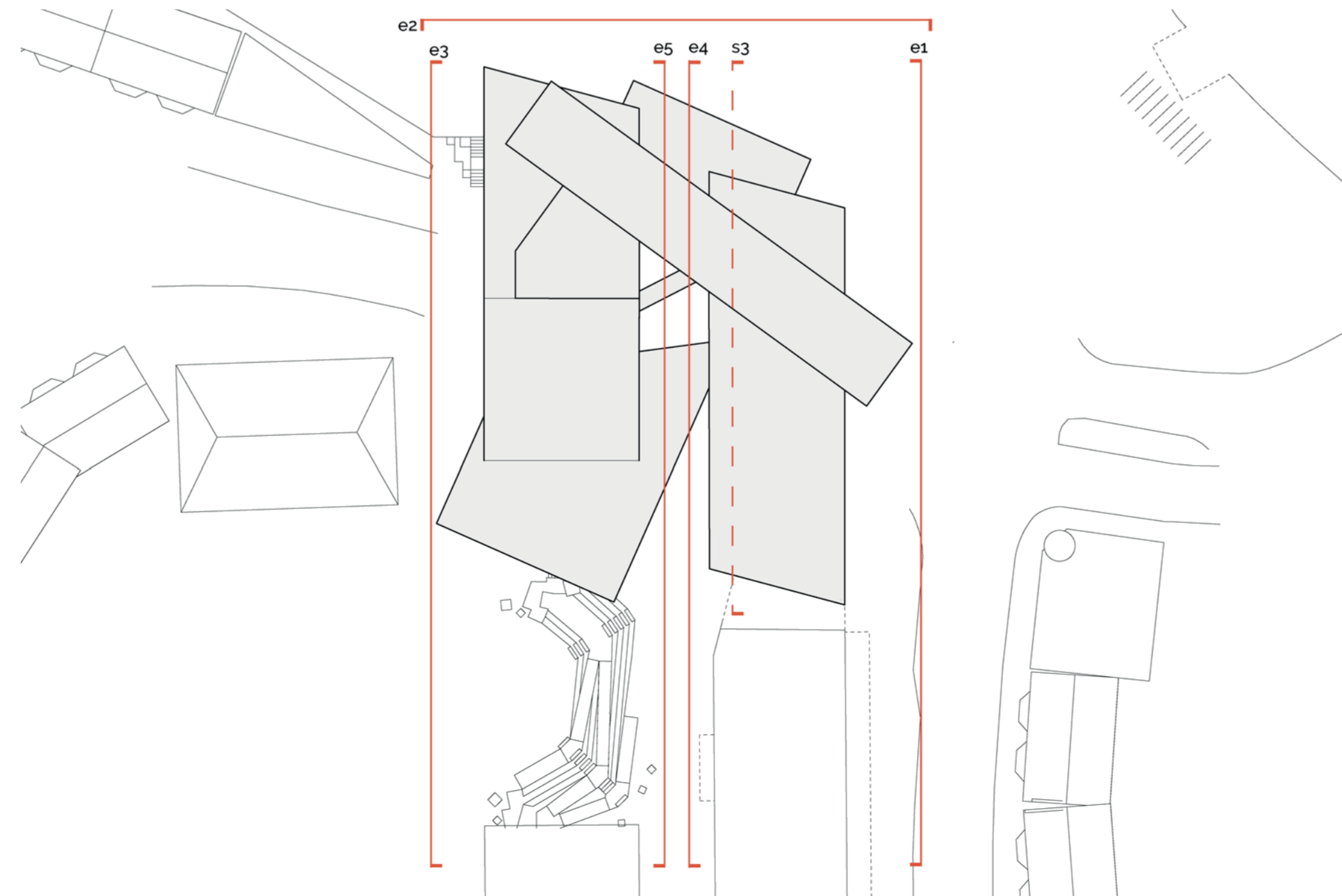
e2 - North elevation. Station Plaza.



e3 - West elevation. Priory Street.



e2 - Mid-west elevation.



e5 - Mid-west elevation.

10m
1:200 @ A2

Section

Clerestory windows run the full-length of the gallery, providing diffuse north-light during the day and a dramatic effect at night.



Vertical circulation areas also provide a stack-like effect



The "Library Box" steel frame sits between the two building's own sandstone frames



The building's structure is exposed in the cafe-bar, sacrificing thermal performance for a modern aesthetic.

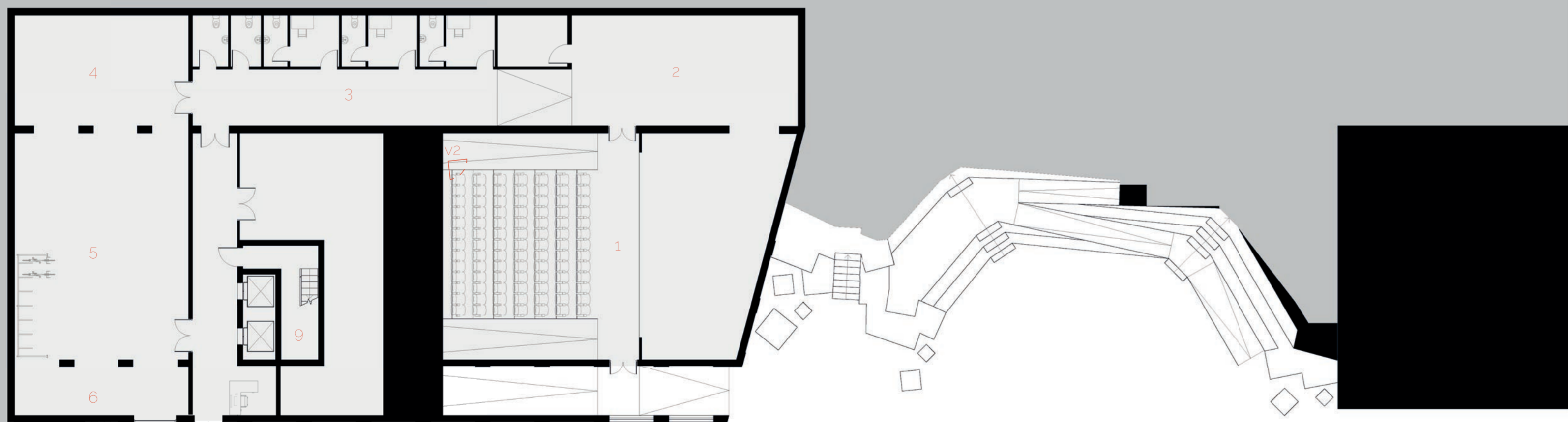
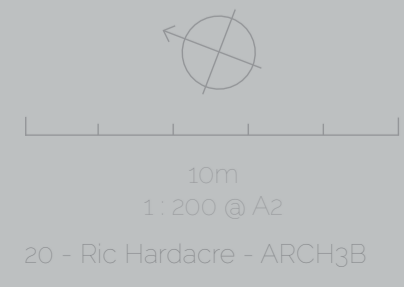


Each building has a concrete core, housing the emergency stairs and service risers. Toilets, kitchen areas, and cleaner's cupboards are clustered around them.

25m
1:50 @ A2

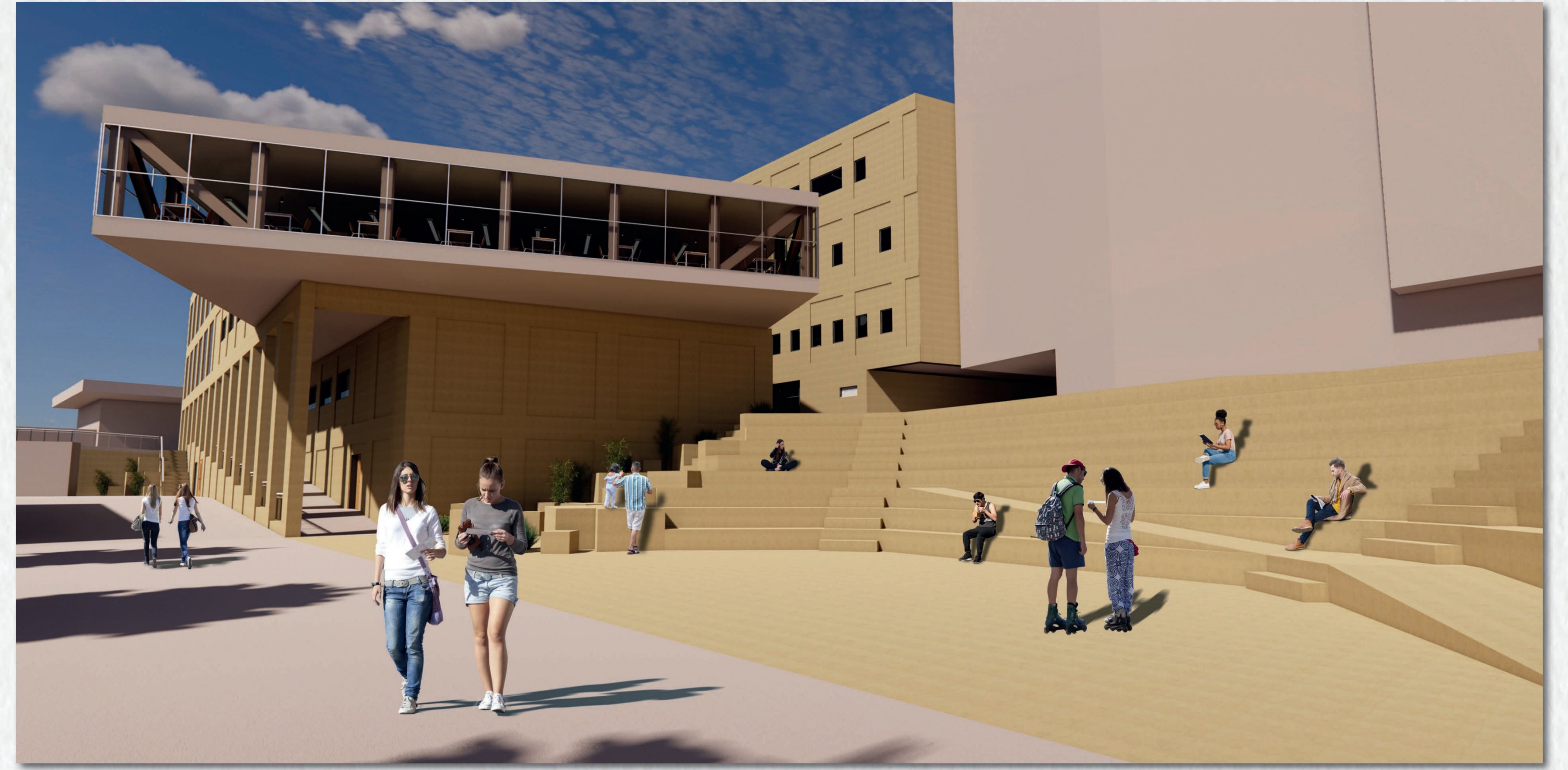
Floor Plan - Lower Ground Floor

- 1 - 160-seat auditorium
- 2 - Backstage
- 3 - Dressing rooms
- 4 - Storage
- 5 - Staff entrance
- 6 - Delivery entrance
- 7 - Cycle parking
- 8 - Bin store
- 9 - Emergency stairs



Cornwallis Terrace

Priory Street



v1 - Amphitheatre - designed to resemble a sandstone quarry - with railway station visible in the distance



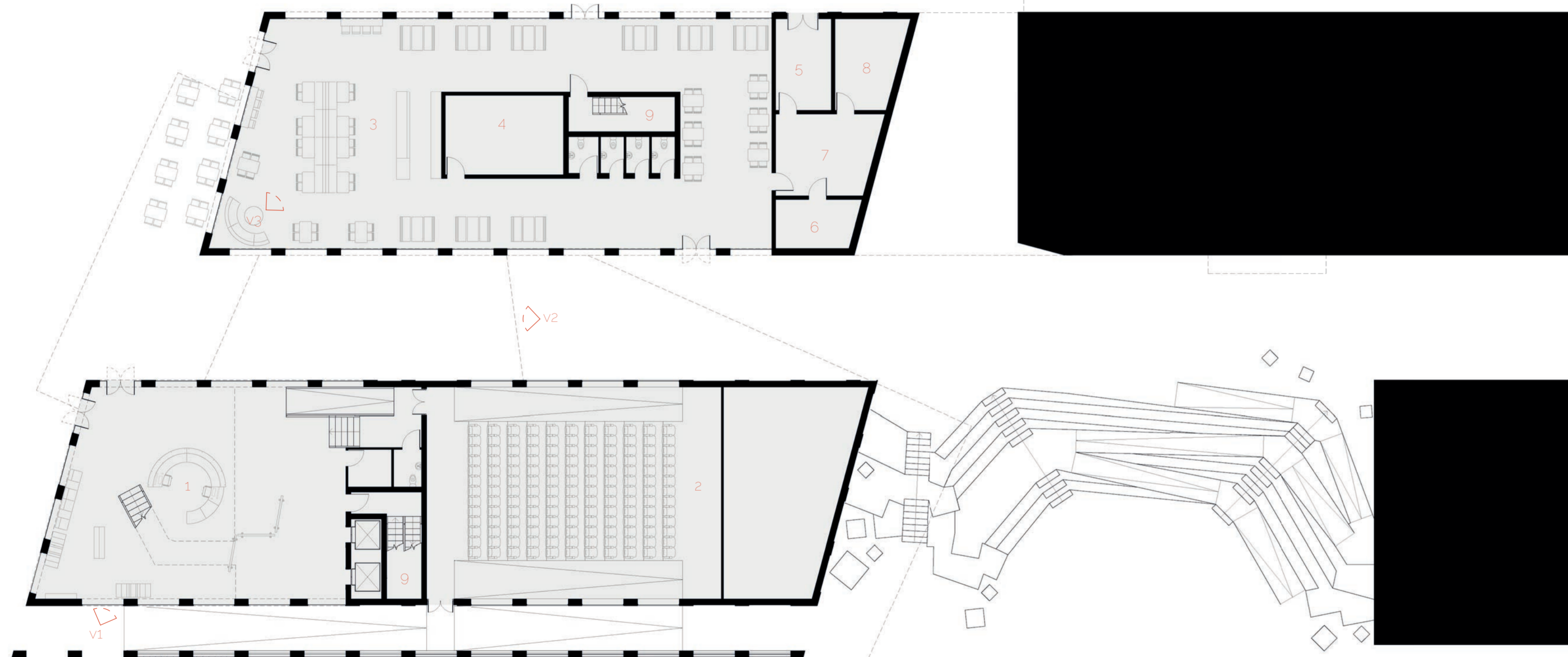
v2 - 160-seat auditorium and theatre space

Floor Plan - Ground Floor

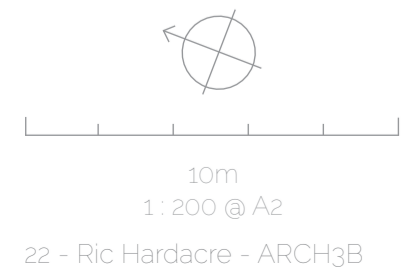
Devonshire Road

Havelock Road

Station Plaza



- 1 - Reception, Town box-office & Tourist Info
- 2 - 160-seat auditorium
- 3 - Cafe-bar / Restaurant
- 4 - Kitchen
- 5 - Bin storage
- 6 - Refrigeration
- 7 - Storage
- 8 - Plant
- 9 - Emergency stairs



22 - Ric Hardacre - ARCH3B



v1 (On mezzanine above) - Main entrance, foyer and vertical circulation

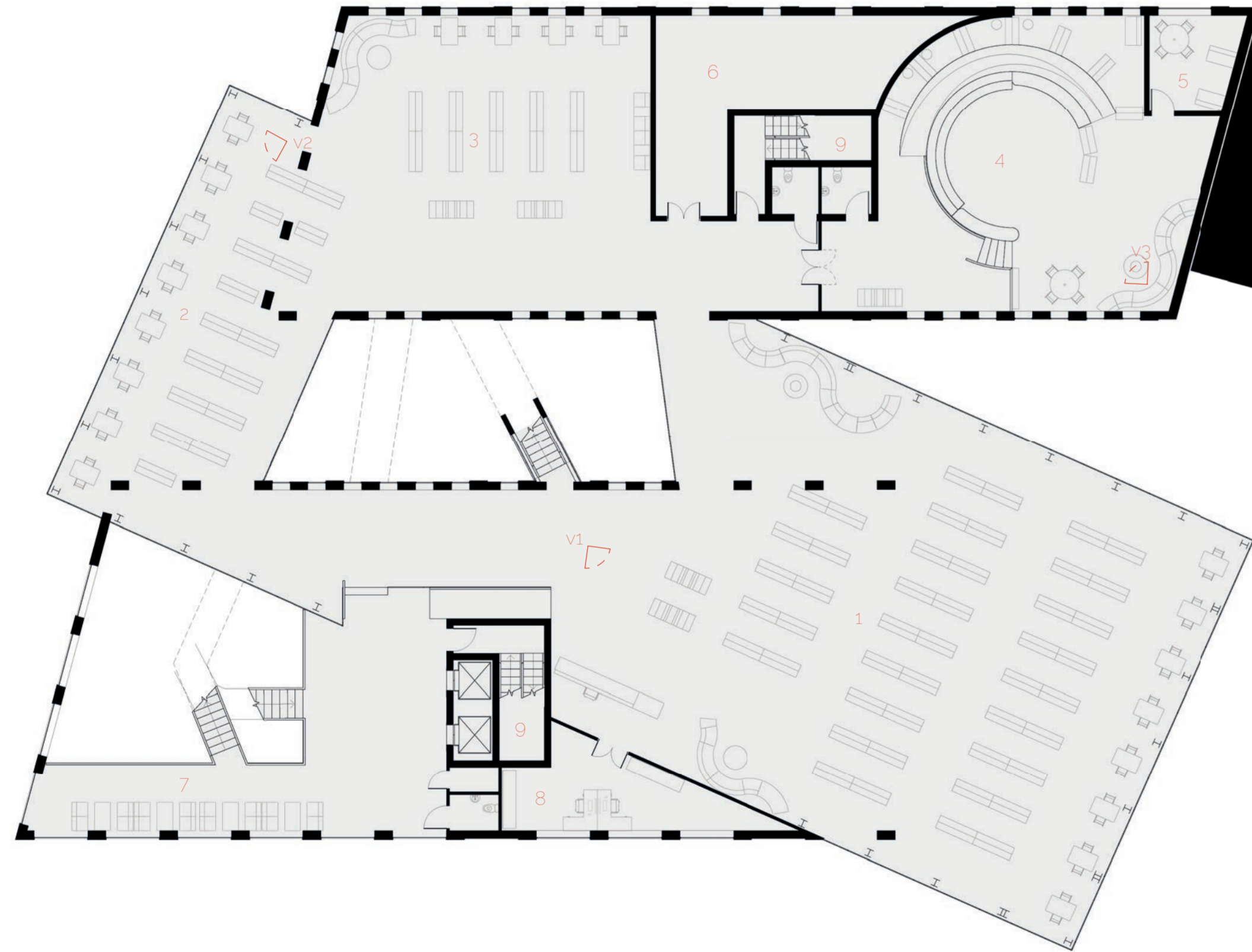


v2 - Cut through linking Priory Square to the Station Plaza

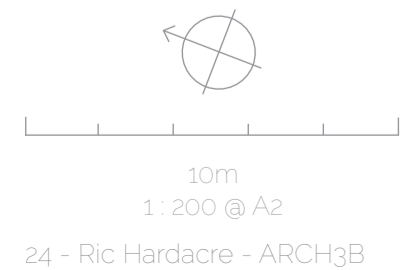


v3 - Cafe-bar / restaurant

Floor Plan - First Floor



- 1 - Adult library - fiction
- 2 - Adult library - non-fiction
- 3 - Teenage and young-adult
- 4 - Children's library
- 5 - Quiet room
- 6 - Storage / Archive
- 7 - Mezzanine and picnic area
- 8 - Staff office
- 9 - Emergency stairs



v1 - Main library, fiction section and help desk



v2 - Main library, reference section

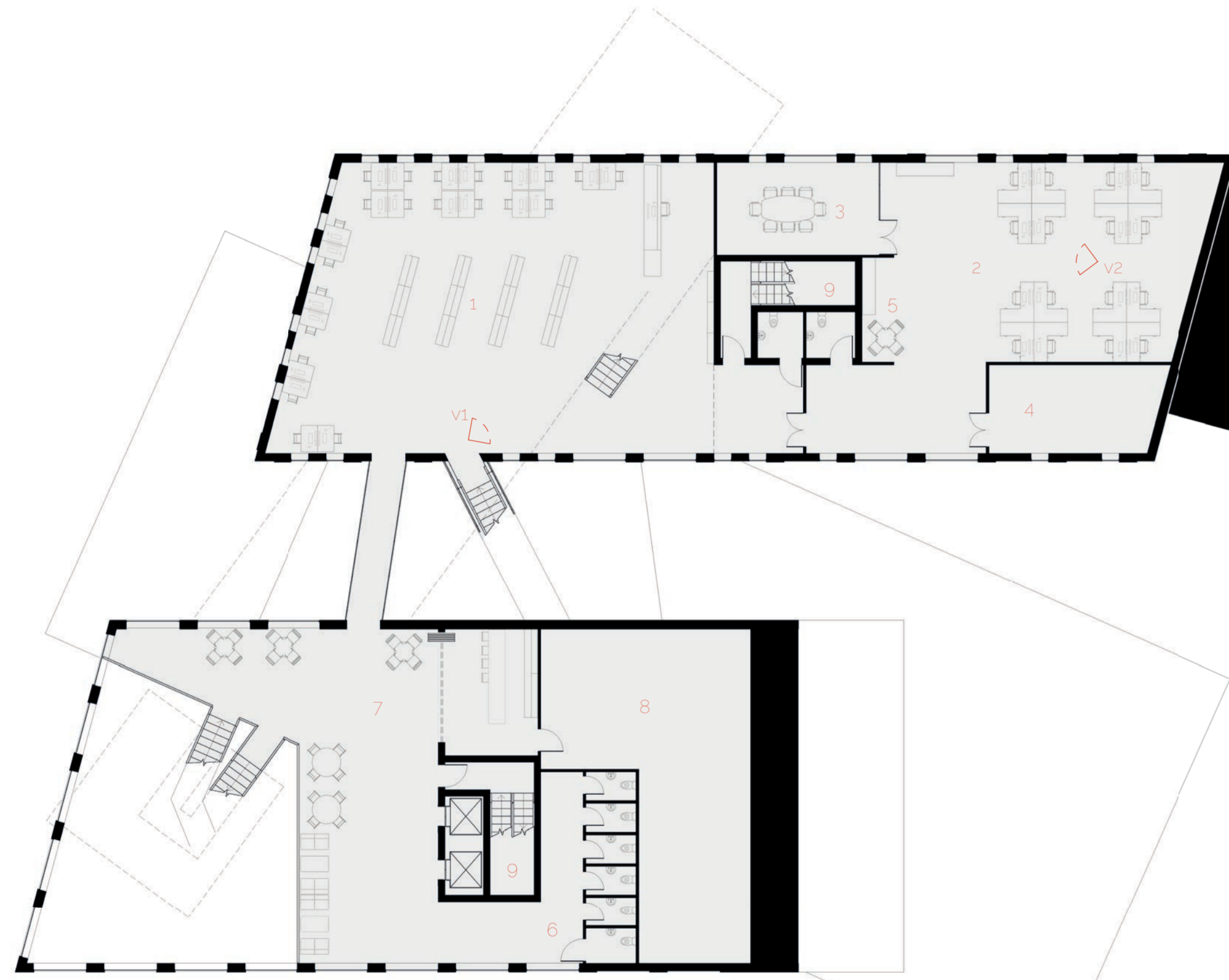


v3 - Children's library. Surfaces are curved to help prevent injury and to make it playful. Includes a central group-reading space, and various reading nooks. To the right is a family/quiet room.

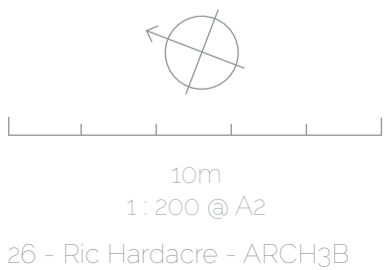


All the soft-furnishings in the building are upholstered in the same red fabric, which takes its colour from Hastings' (top) and East Sussex's (bottom) coats of arms. Adding splashes of colour throughout.

Floor Plan - Second Floor



- 1 - Digital library
- 2 - Staff office
- 3 - Meeting room
- 4 - Storage
- 5 - Kitchenette
- 6 - Public toilets
- 7 - Mezzanine, pop-up bar
- 8 - Cellar, storage
- 9 - Emergency stairs



The carpets in the different areas call back to the colour-scheme in the old library, creating a sense of familiarity and reinforcing the idea that the library is an artifact that has moved, rather than it having been replaced.



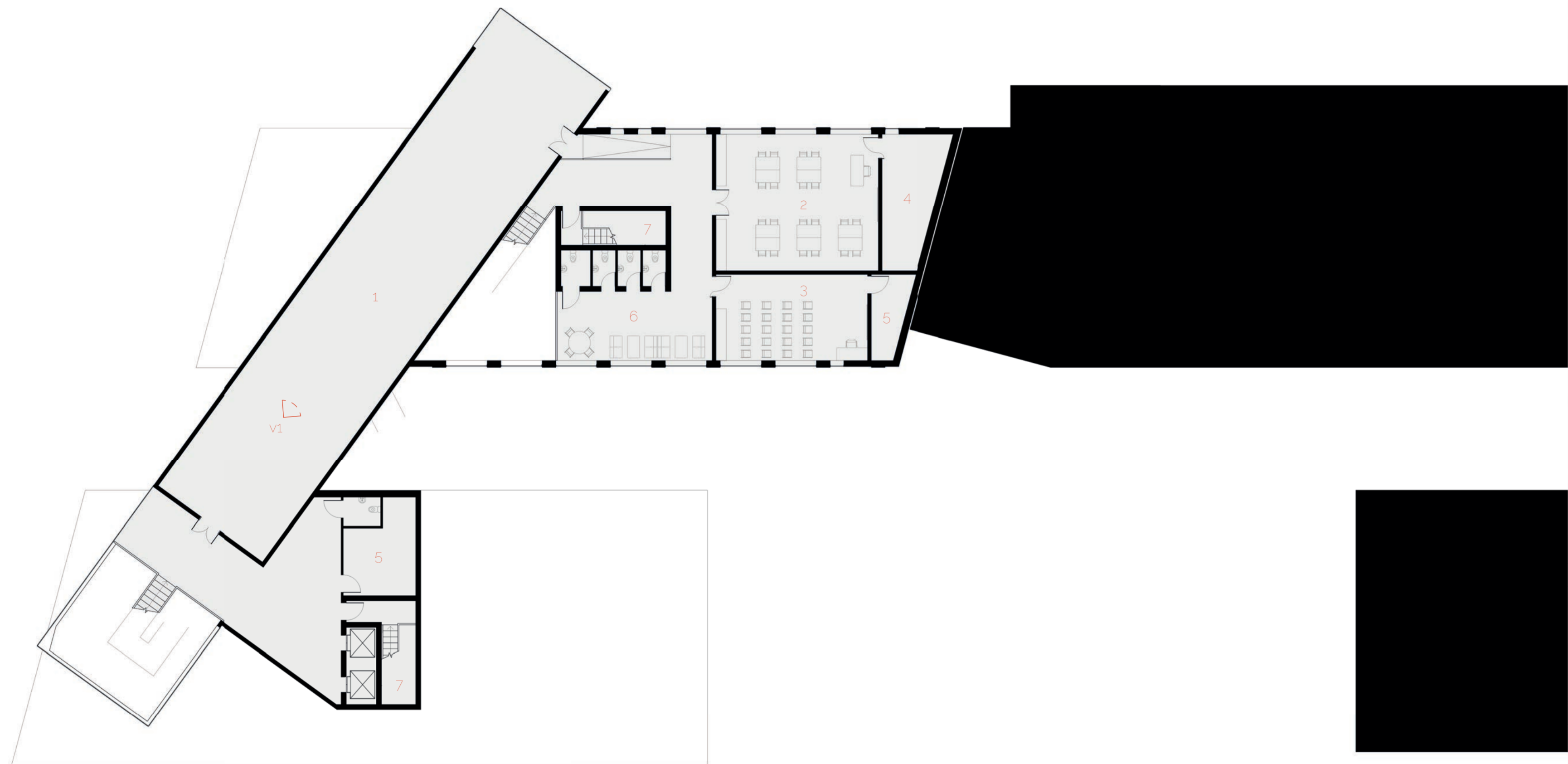
v1 - Digital library - Public-use computers, CDs, DVDs, games, audiobooks etc.



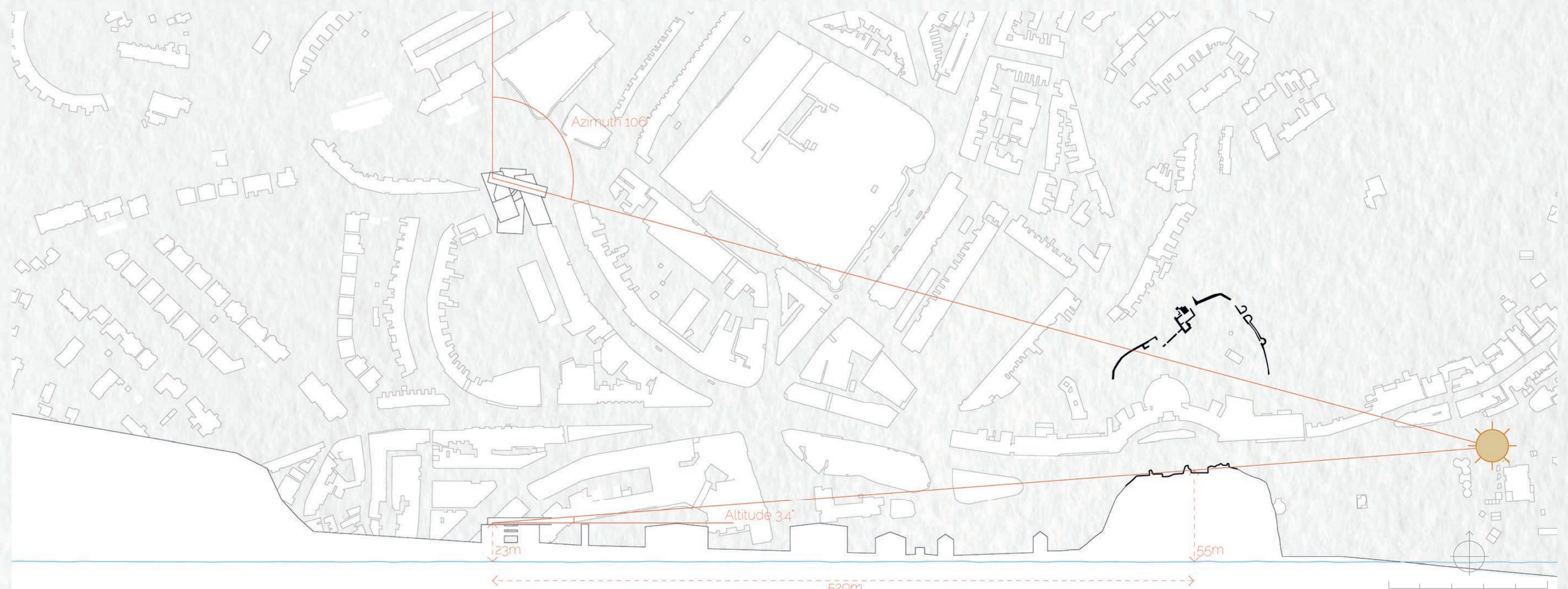
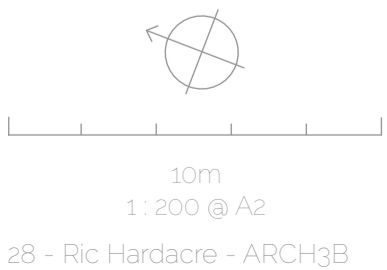
v2 - Staff offices. The existing library's offices are in a cramped basement.

The double-height space here provides both a visual connection between levels and acts as a light-well, with large windows to the southwest.

Floor Plan - Third Floor

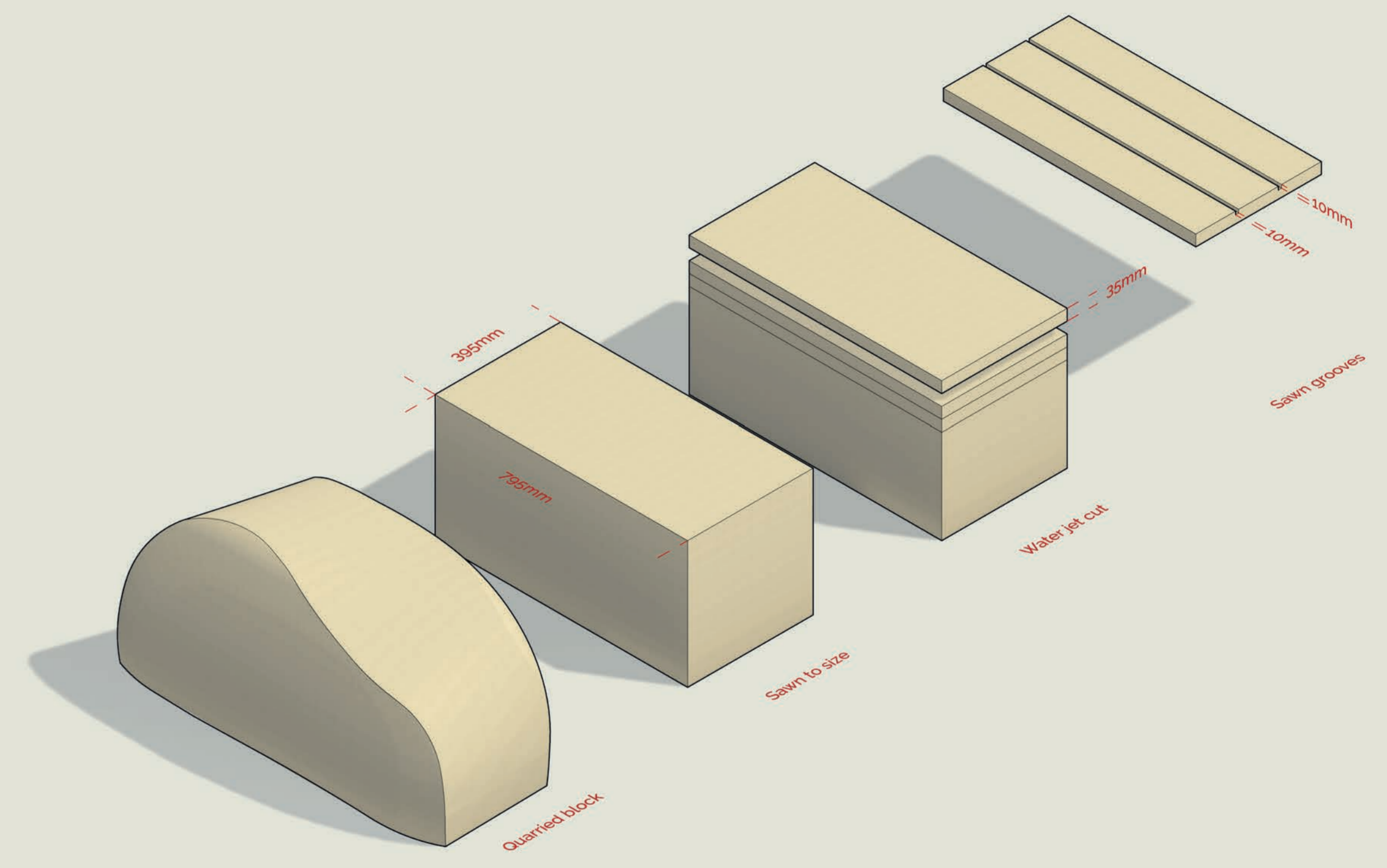


- 1 - Gallery
- 2 - Large classroom
- 3 - Small classroom
- 4 - Office / storage
- 5 - Storage
- 6 - Mezzanine / breakout area
- 7 - Emergency stairs



7:45am October 14th - The anniversary of the Battle of Hastings

Roof Plan

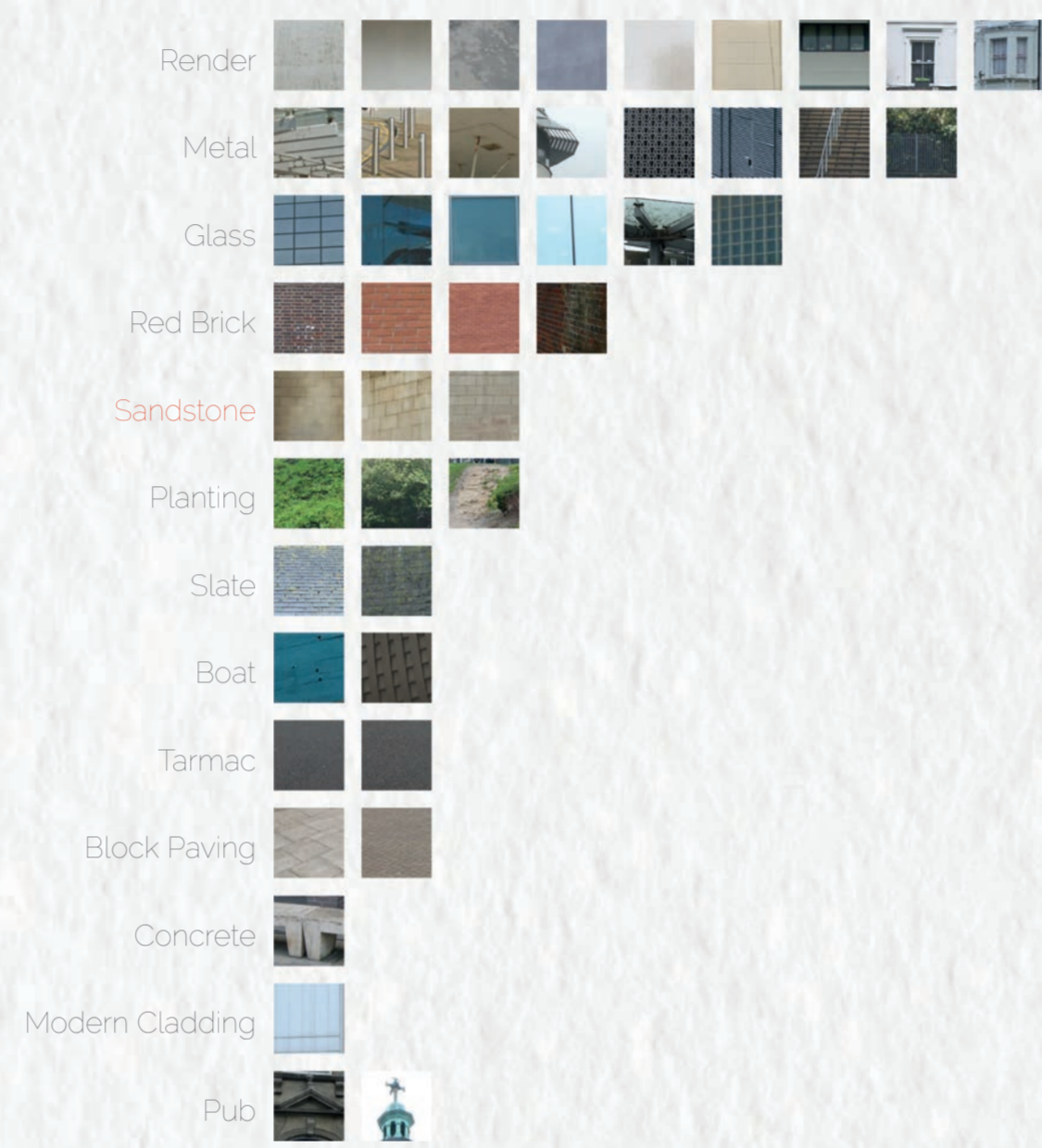


Technical Report

Site Materiality



Spatial Distribution



Frequency Distribution



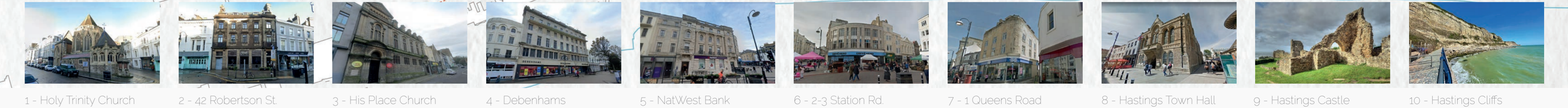
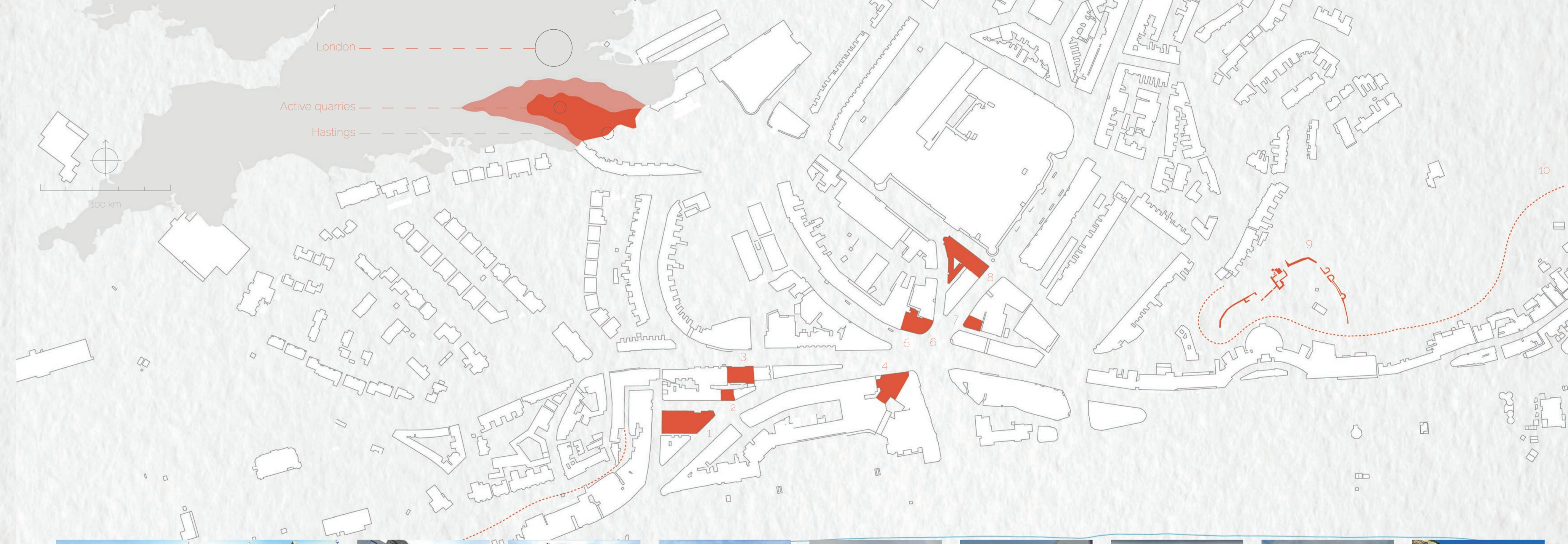
v1,v2,v3 - While most of the frontages on the plaza are render or render-like cladding there are splashes of sandstone dotted around. The station building has the most, alongside large areas of glass and white-painted metals

Local Sandstone

The Ashdown Beds

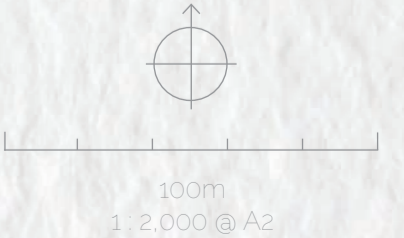
Hastings' cliffs mark the coastal extent of the Ashdown Beds, a large deposit of sandstone - known as Wealden Sussex Sandstone - which is estimated to be between 100 and 200 metres thick. The sedimentary rock was formed over the course of around 40 million years, between 100 and 140 million years ago.

There are active quarries less than 50km from Hastings, near Crawley, providing a local low-carbon source of building material.



Sandstone in Hastings

Despite the availability of sandstone in the area, most of the buildings in the town are brick-built, and usually rendered. Most-likely due to a mixture of cost, skill-availability and tradition. Sandstone is reserved almost exclusively for churches, banks and other major buildings, such as the town hall and castle.



Sandstone Properties



Difficult to scratch or cut, a high-degree of hardness



Inelastic. Will chip if struck at a vulnerable point, but will not fracture or shatter



Drillable



Cuttable with professional tools. Very smooth, sharp edges result



Non-flammable with a high-degree of thermal capacity. Useful for smoothing day-night temperature swings



Material Properties

	Density kg/m ³	Thermal Conductivity W/mK	Compressive Strength N/mm ²	Tensile Strength N/mm ²
Sandstone	2,600	2.3	~80	40
Reinforced Concrete	2,400	2.5	40	~400
Brick	1,700	1.3	11	2
Glass	2,500	1.1	1,000	~170
Mild Steel	7,850	50	1,000	800
Plasterboard	950	0.2		

Sandstone and Steel-reinforced concrete have very similar material properties, with the only major difference being tensile strength.

Ageing

Edges erode and become rounded due to wind, rain and human interaction.

Chipping caused by blunt force or shearing via material defects

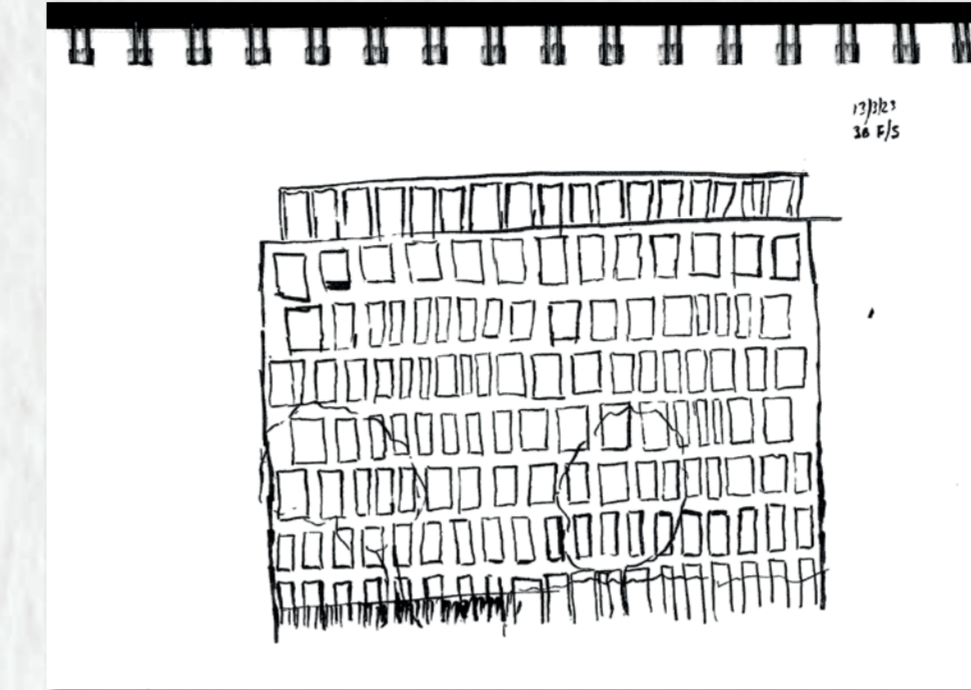
Moss growth if water is allowed to strike-upon or run down the surface

Organic material build-up when damp for extended periods of time

Natural weathering reduces colouring over time, eventually turning it grey



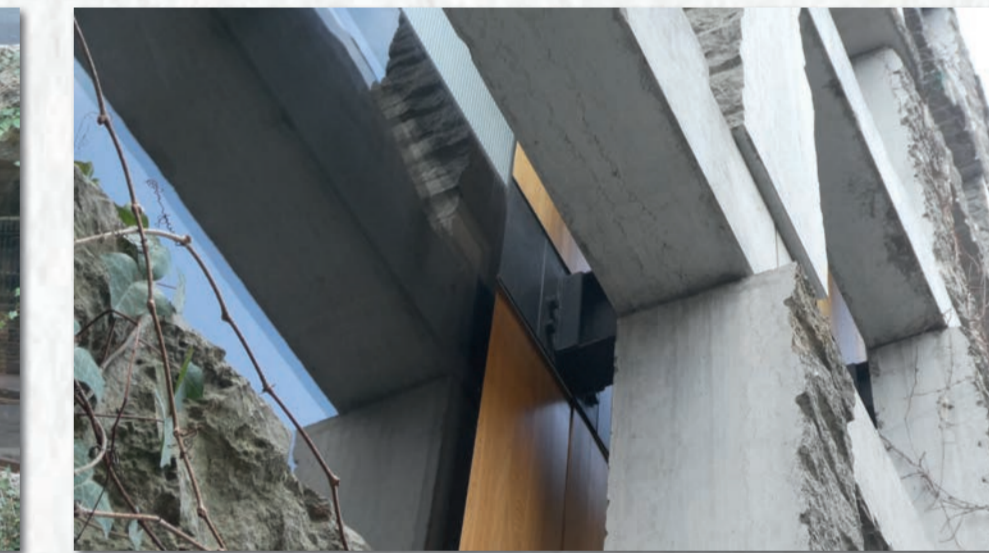
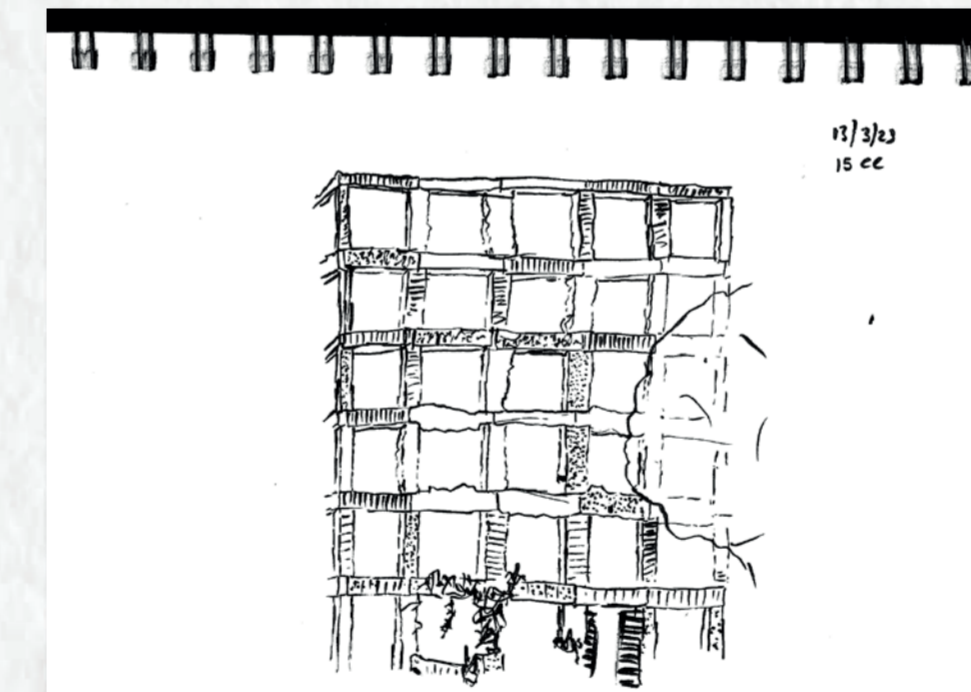
Stone Precedents



30 Finsbury Square

Eric Parry Architects
London, 2003

RIBA London Award - Winner (2003)
Stirling Prize - Shortlisted (2003)



15 Clerkenwell Close

Amin Taha Architects
London, 2017

RIBA National Award - Winner (2018)
RIBA London Award - Winner (2018)

The use of load-bearing stone walls in construction is not new, but - having being rejected by modernists as a classical material - it is making a comeback. Compared to concrete it has essentially zero embedded carbon, with only the quarrying, cutting and installation work adding to its environmental impact.

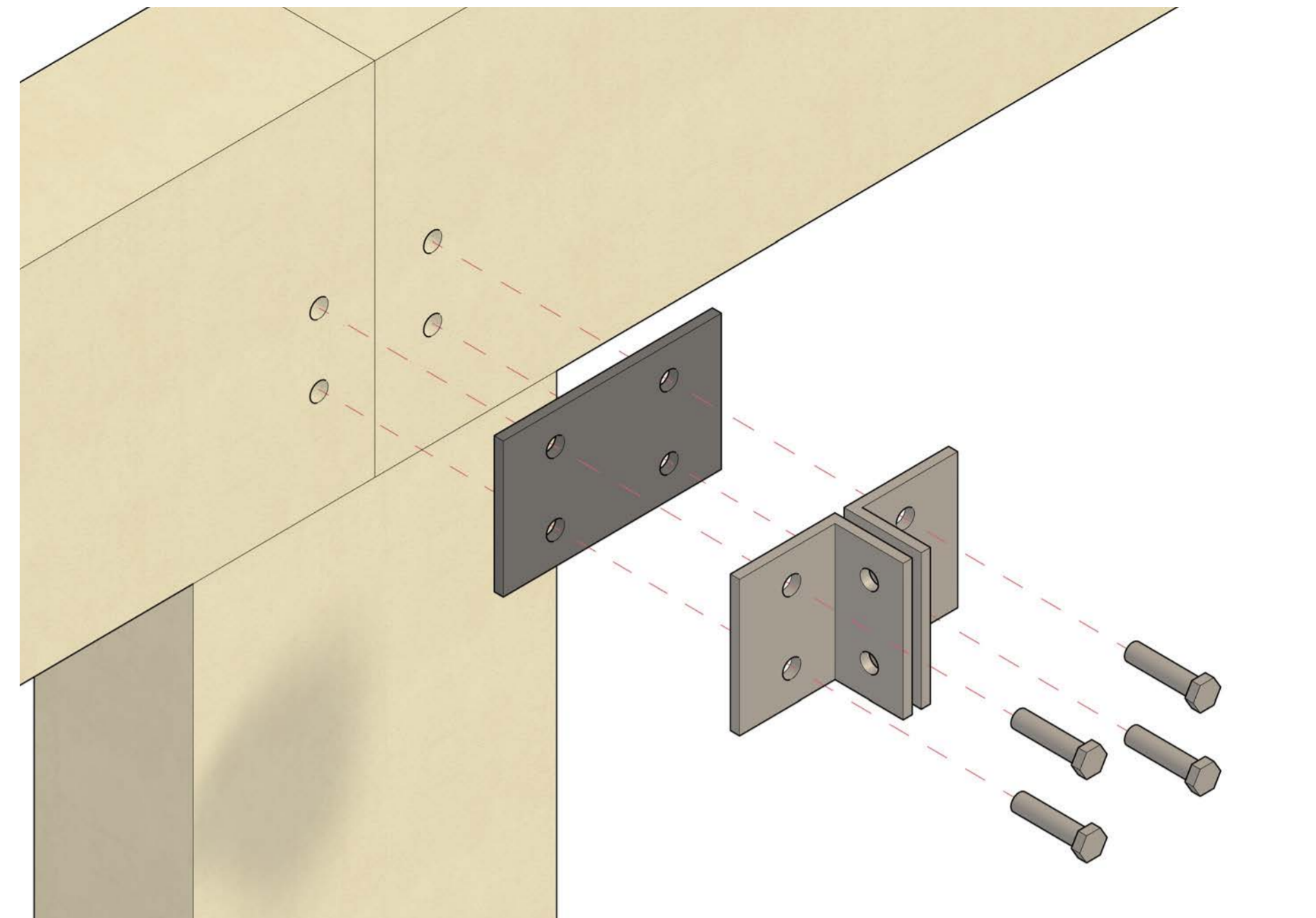
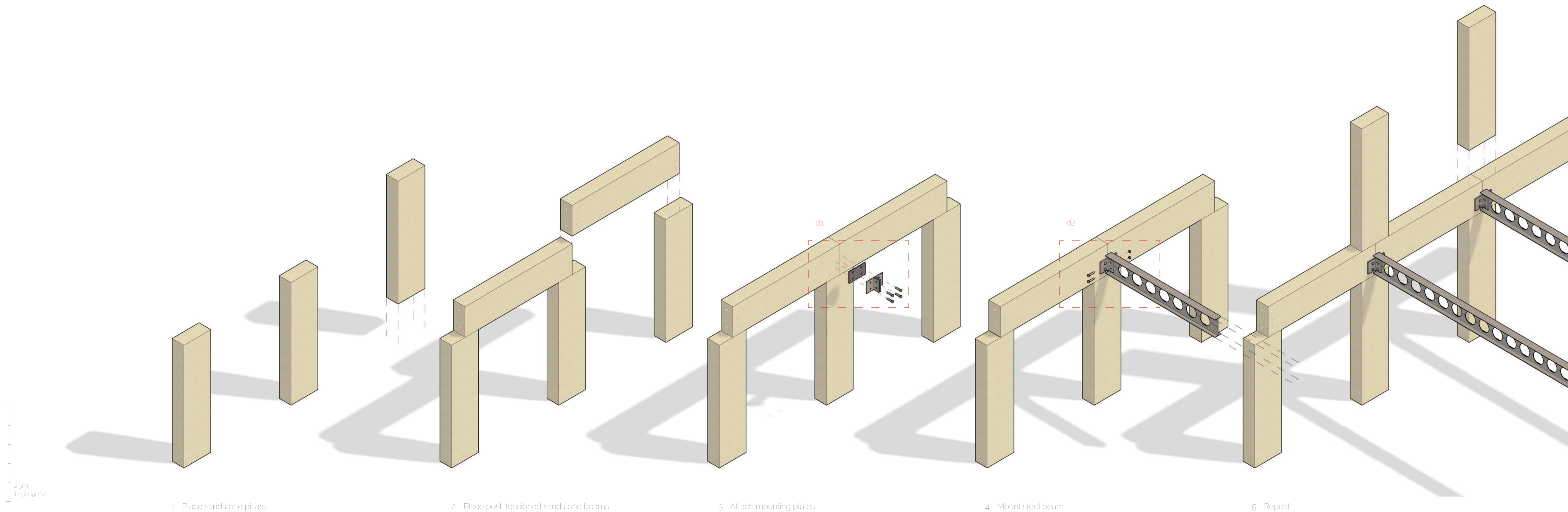
Both these buildings use steel beams to tie their frames to the opposite wall or a concrete core (required by fire regulations), and require no internal pillars to support the floors above.

Modular Construction

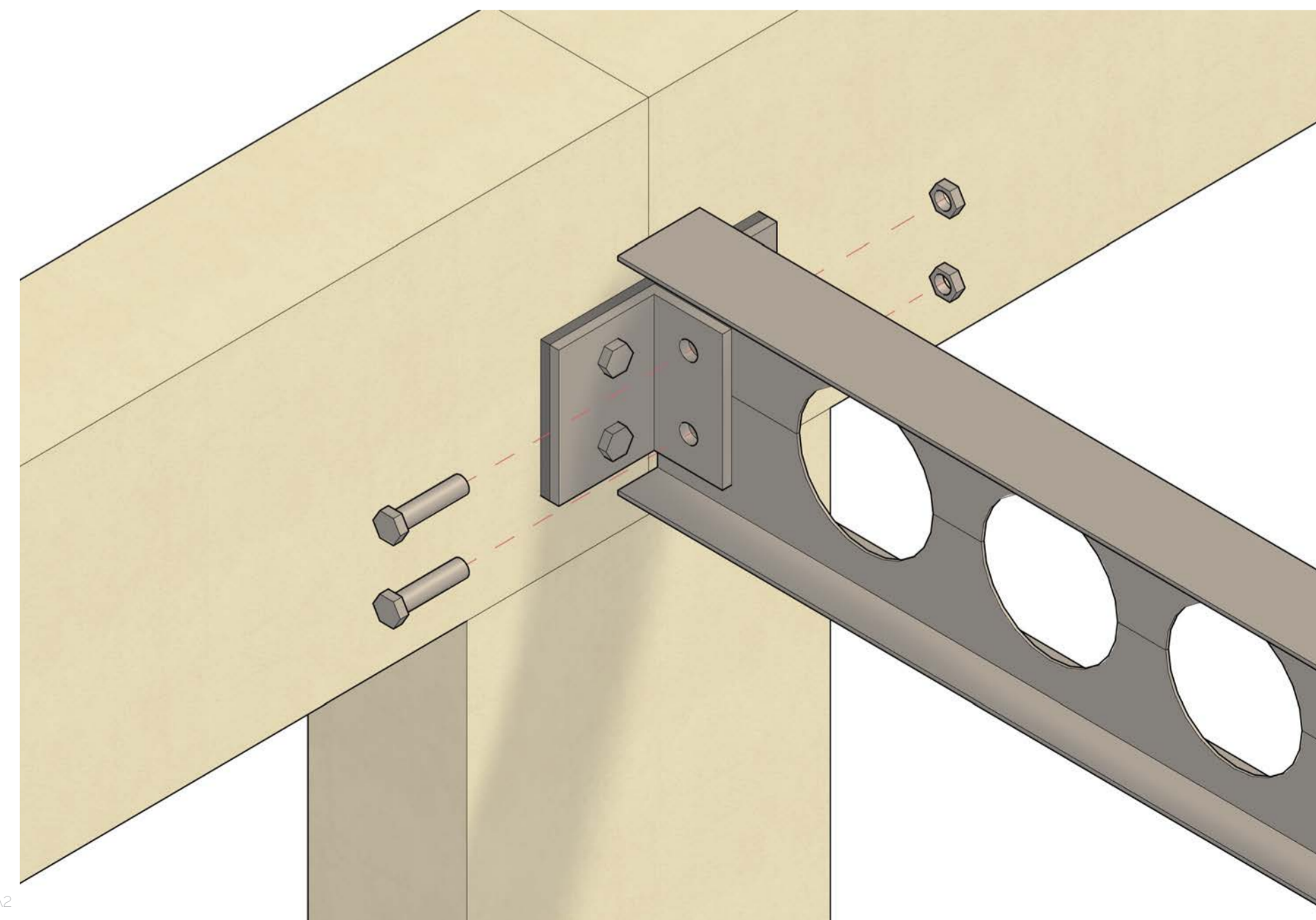
The sandstone pillars and beams are cut to exact-size at the quarry using computer-controlled machinery. The beams are post-tensioned and they are then shipped directly to site, where they are installed by crane.



Sandstone is quarried by drilling or sawing. It can then be saw- or water-jet-cut to precise dimensions



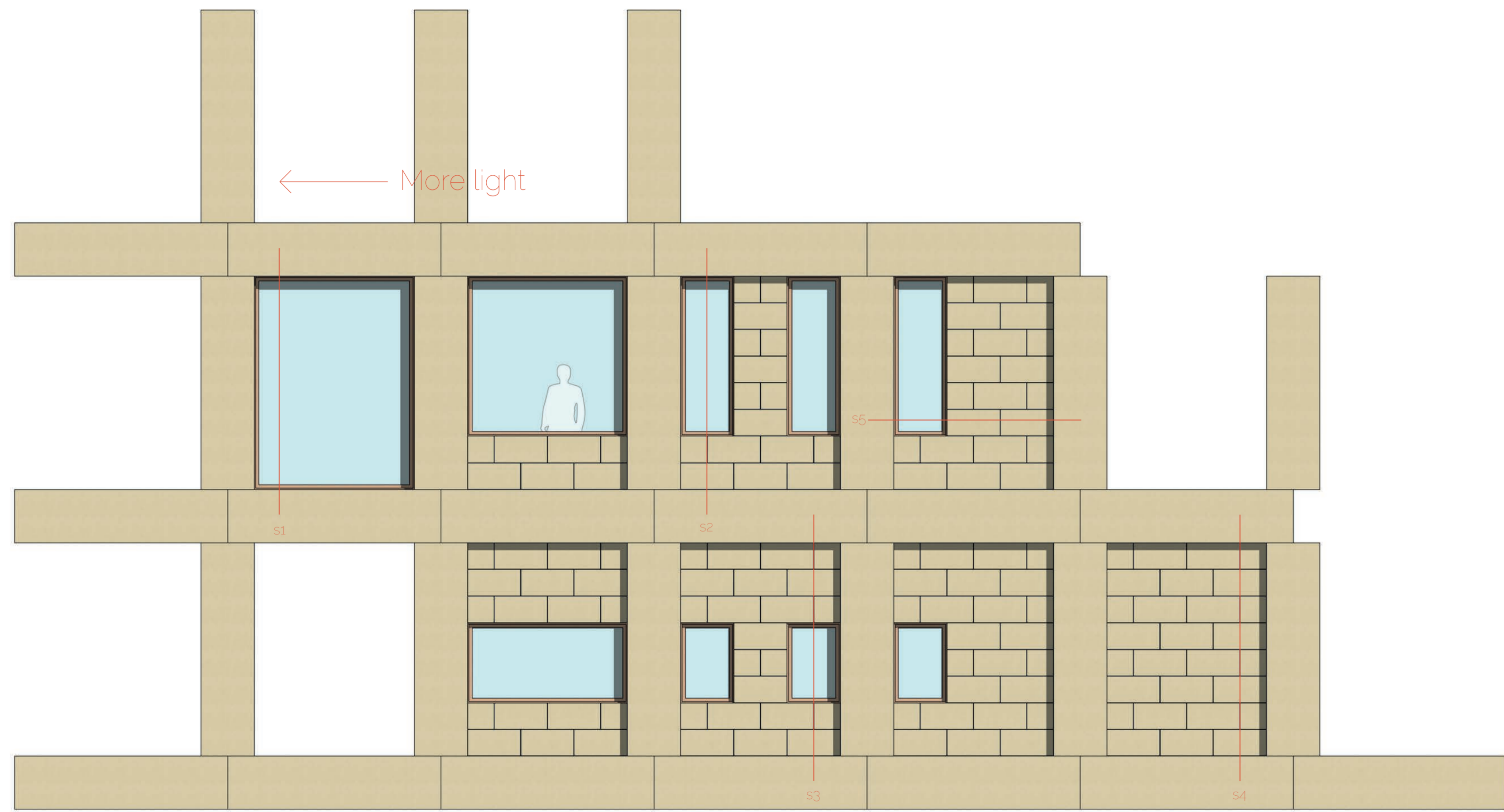
d1 - Fixing plates attached to the sandstone beams via pre-drilled holes. The nylon spacer mitigates thermal bridging.



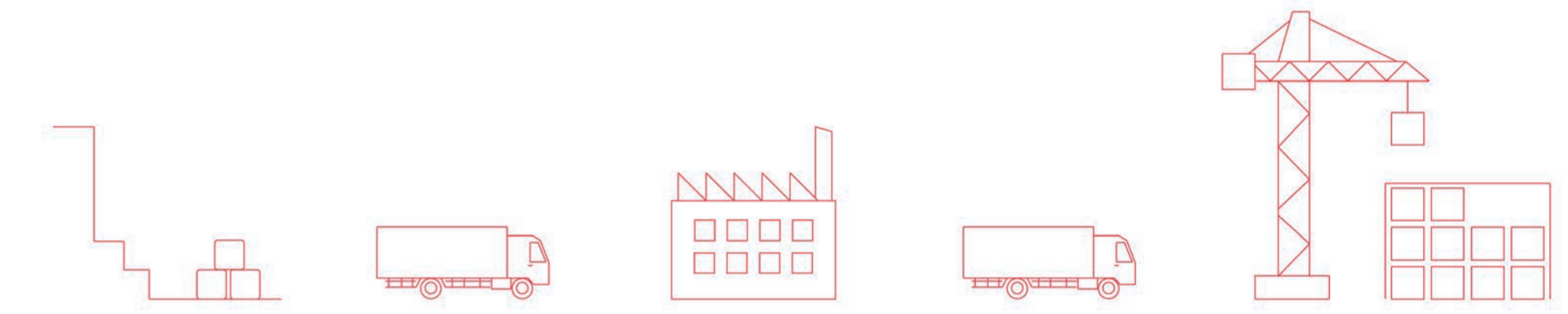
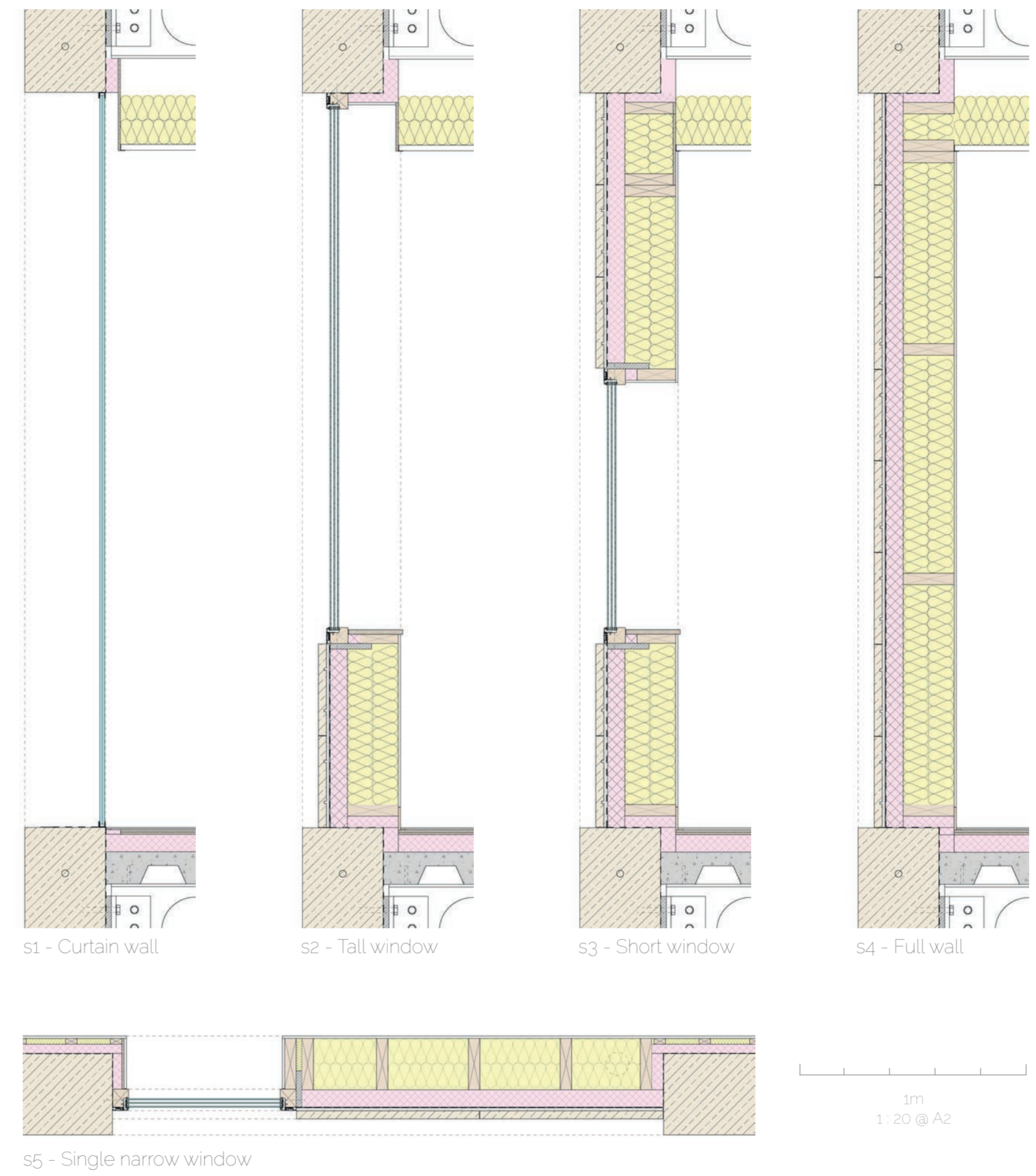
d2 - Steel beams attached to mounting plates, and connected to opposite wall - or concrete core - at the same time.

Modular Construction

Most of the building is made up of just eight variations of panel (minus reflectional variations), with each placed according to the need to balance natural light versus privacy. There are only five window sizes - excluding the curtain-walled library and gallery spaces - reducing complexity and costs.



8 panel variations 5 window sizes

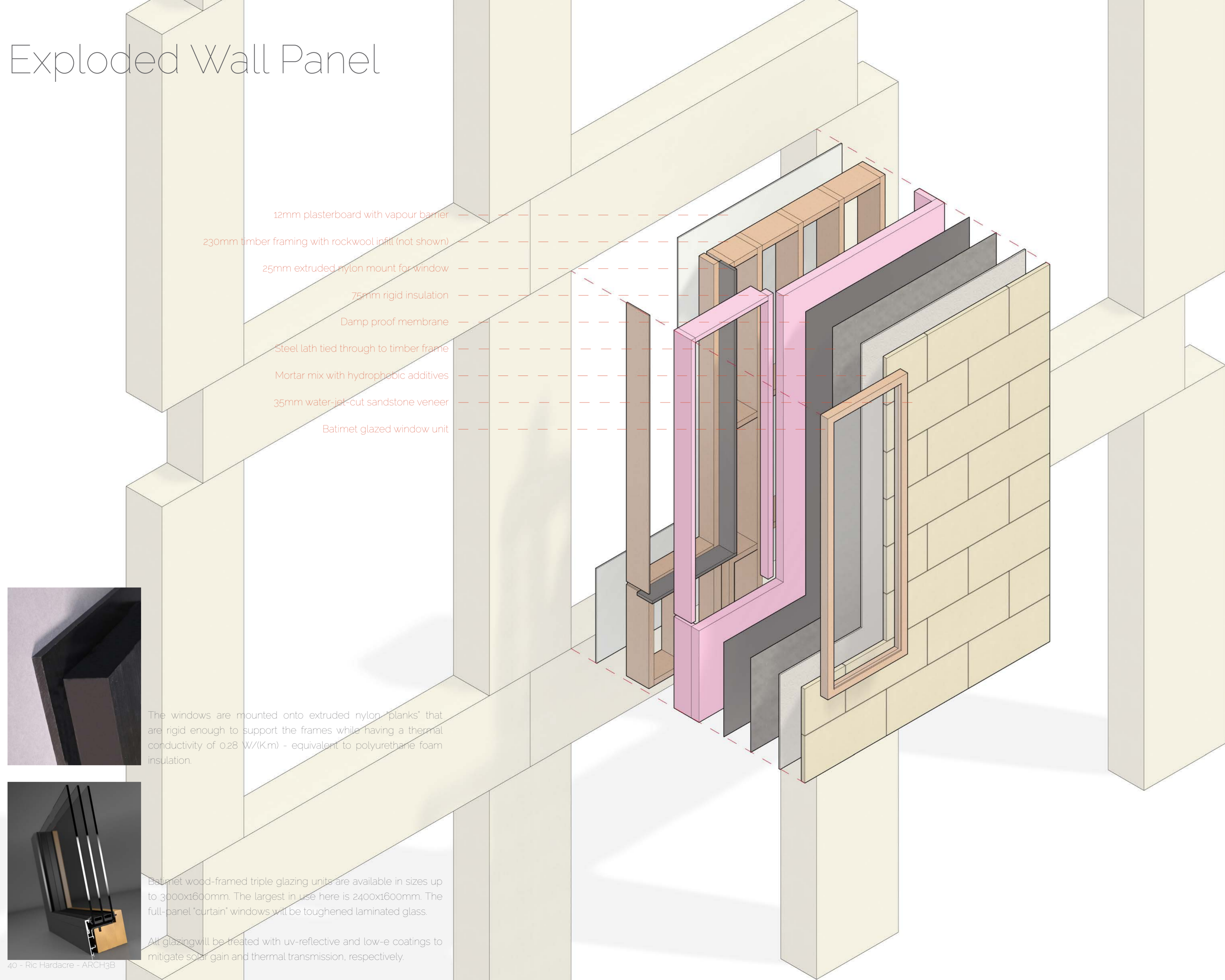


The module's components - including sandstone - can be shipped to a factory outside of town, assembled there and then delivered to site to be installed. This minimises the amount of materials that are stored onsite, reduces construction traffic and allows the modules to be built in a dry, controlled environment.

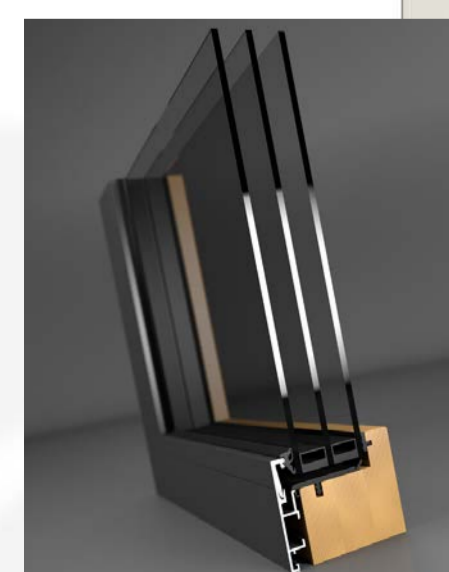


- 1 - Storage - Maximise wall space
- 2 - Classroom - Compromise light/distractions
- 3 - Circulation - Vary
- 4 - Staff office - Private
- 5 - Meeting room - More light than office so that it is not uninviting
- 6 - Library - Balance natural and artificial light
- 7 - Family room - Compromise light/privacy
- 8 - Children's library - Many small windows are more fun!
- 9 - Cafe/Bar - Public

Exploded Wall Panel



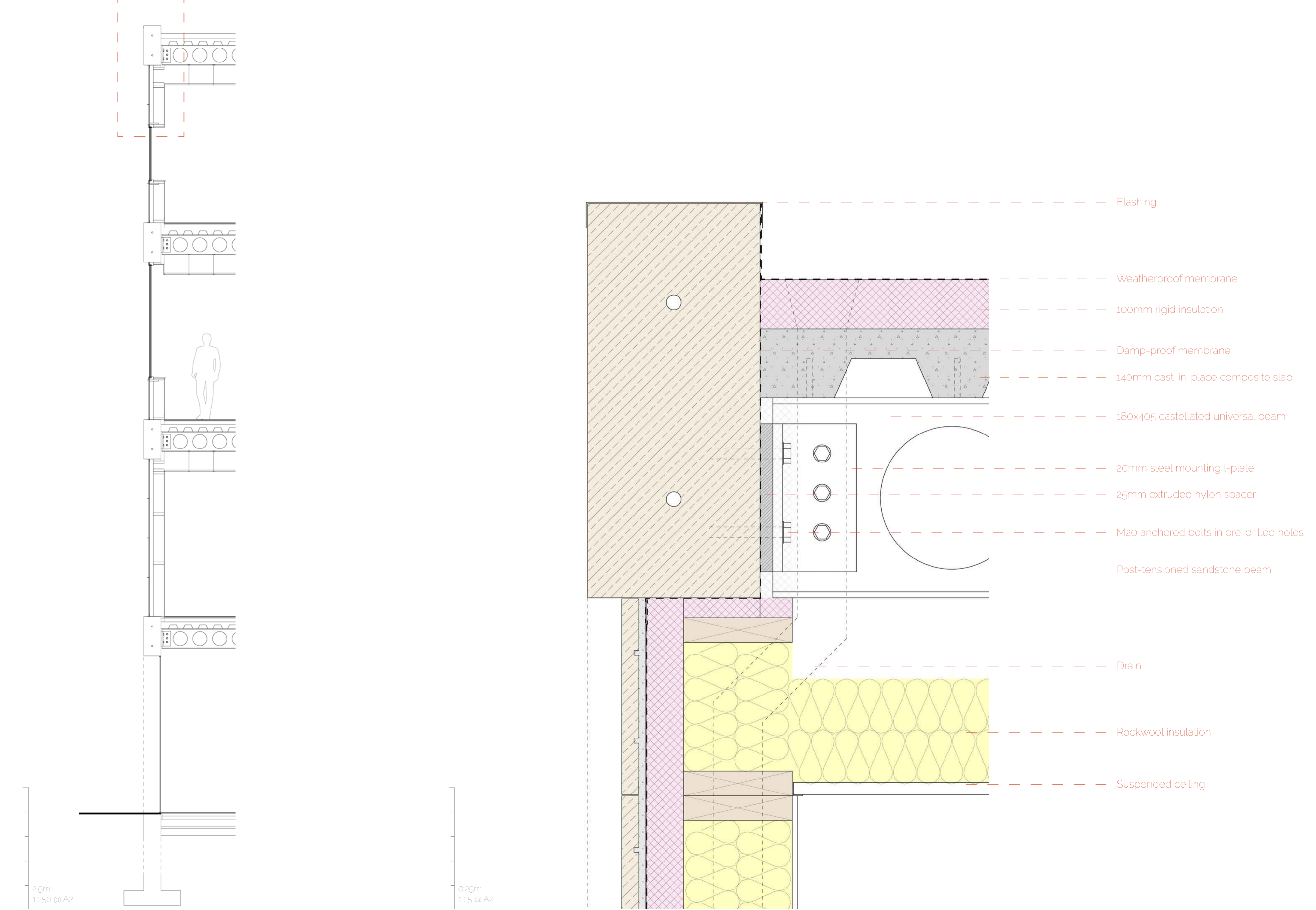
The windows are mounted onto extruded nylon "planks" that are rigid enough to support the frames while having a thermal conductivity of 0.28 W/(K.m) - equivalent to polyurethane foam insulation.

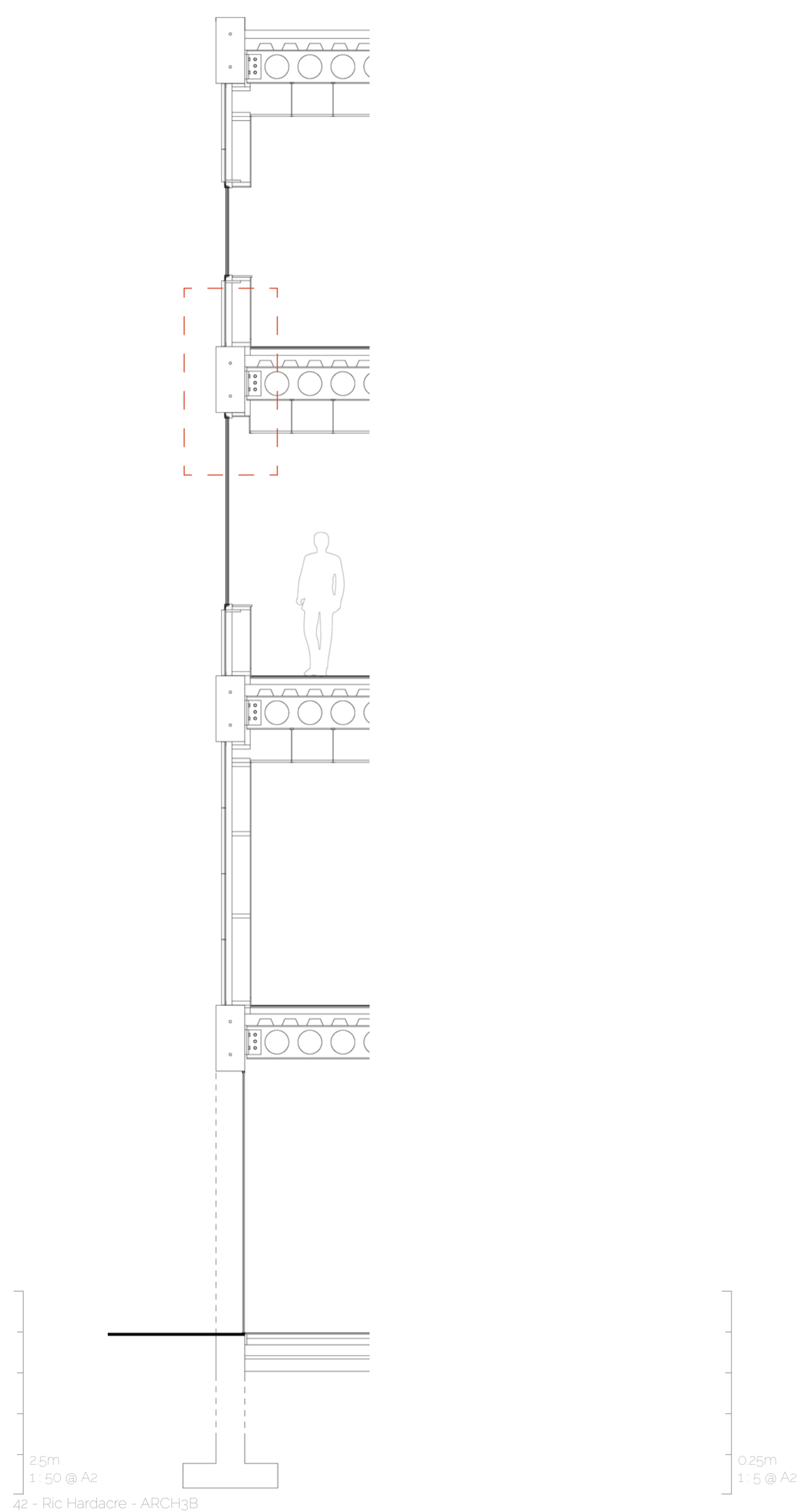


Batimet wood-framed triple glazing units are available in sizes up to 3000x1600mm. The largest in use here is 2400x1600mm. The full-panel "curtain" windows will be toughened laminated glass.

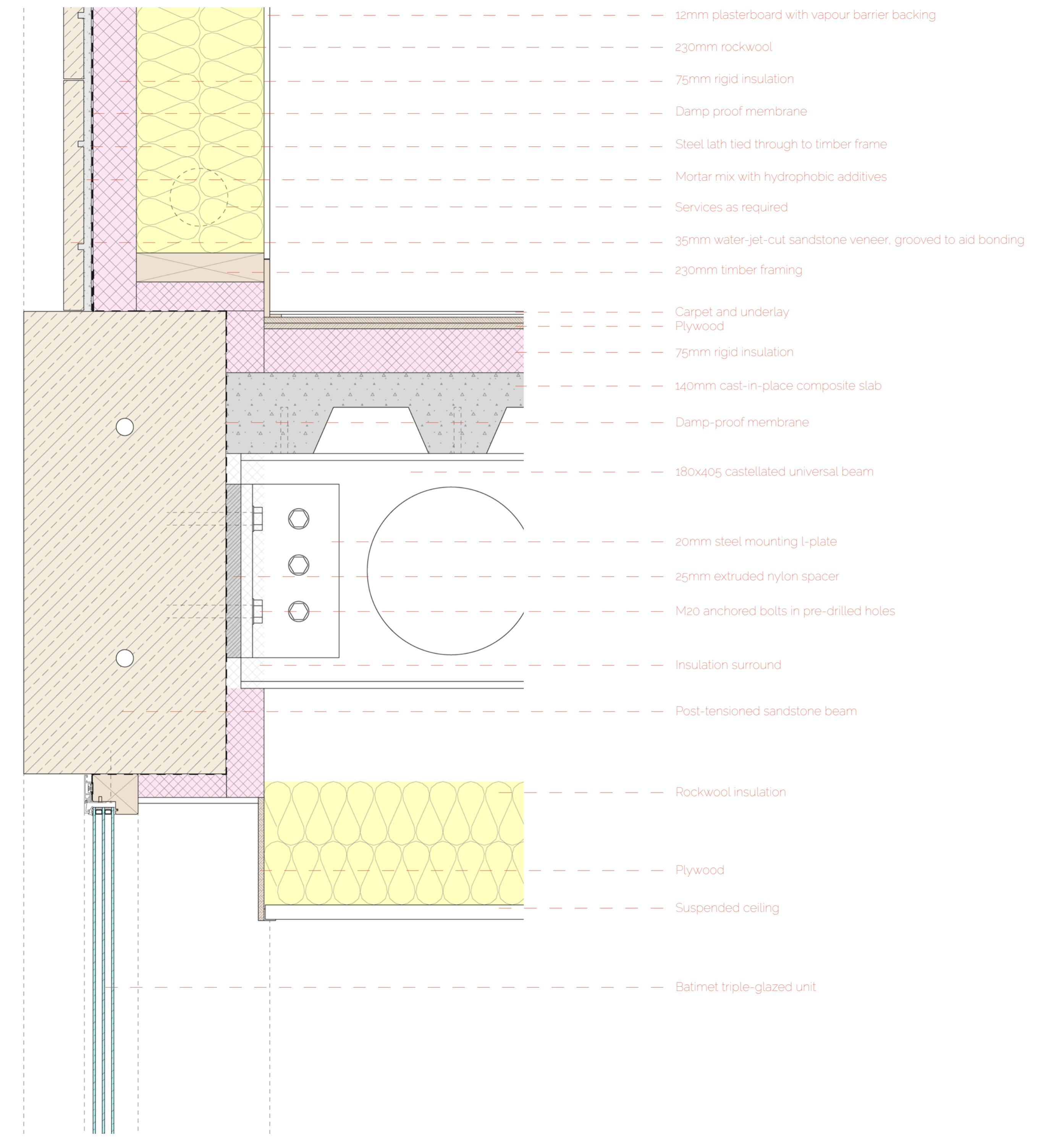
All glazing will be treated with uv-reflective and low-e coatings to mitigate solar gain and thermal transmission, respectively.

Technical Sections

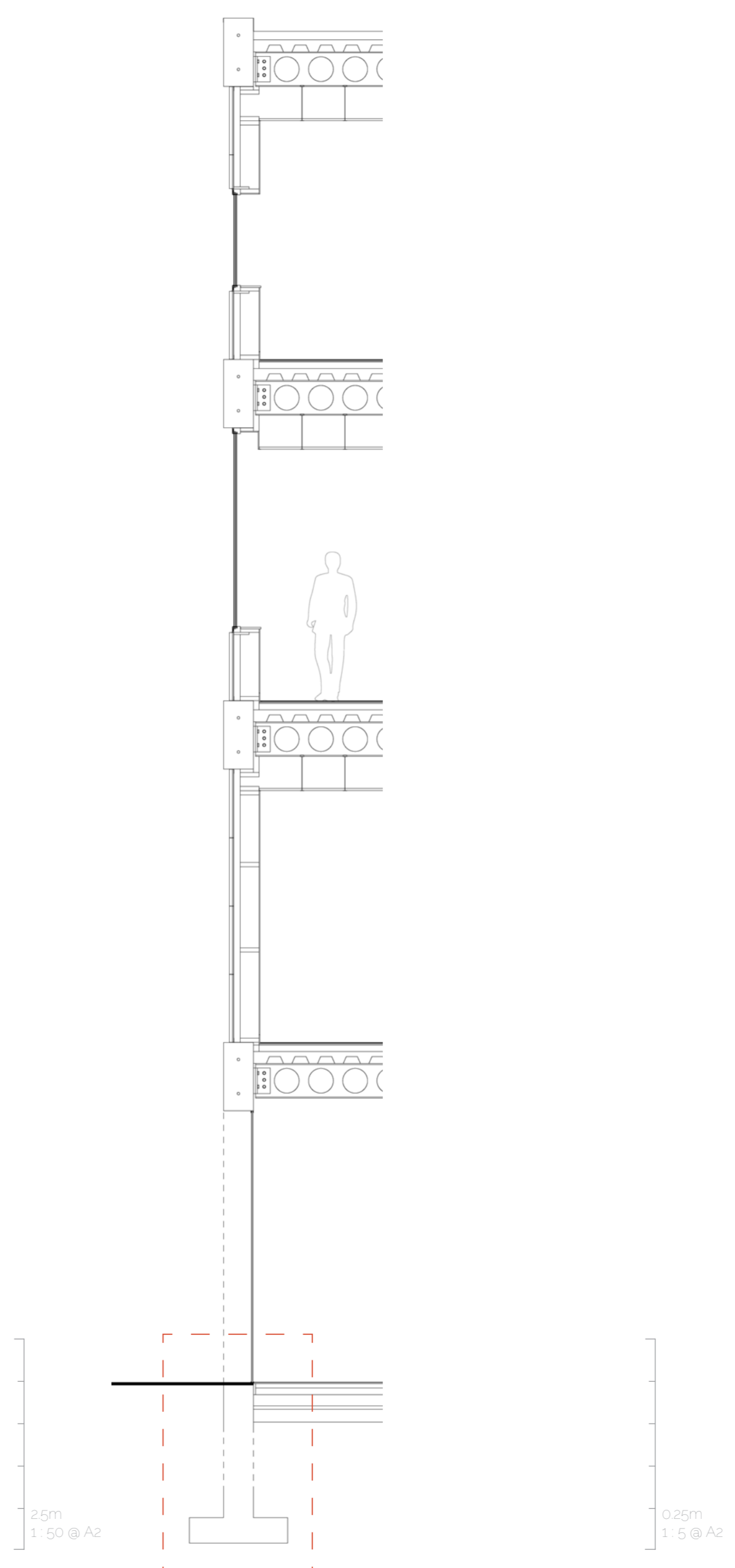




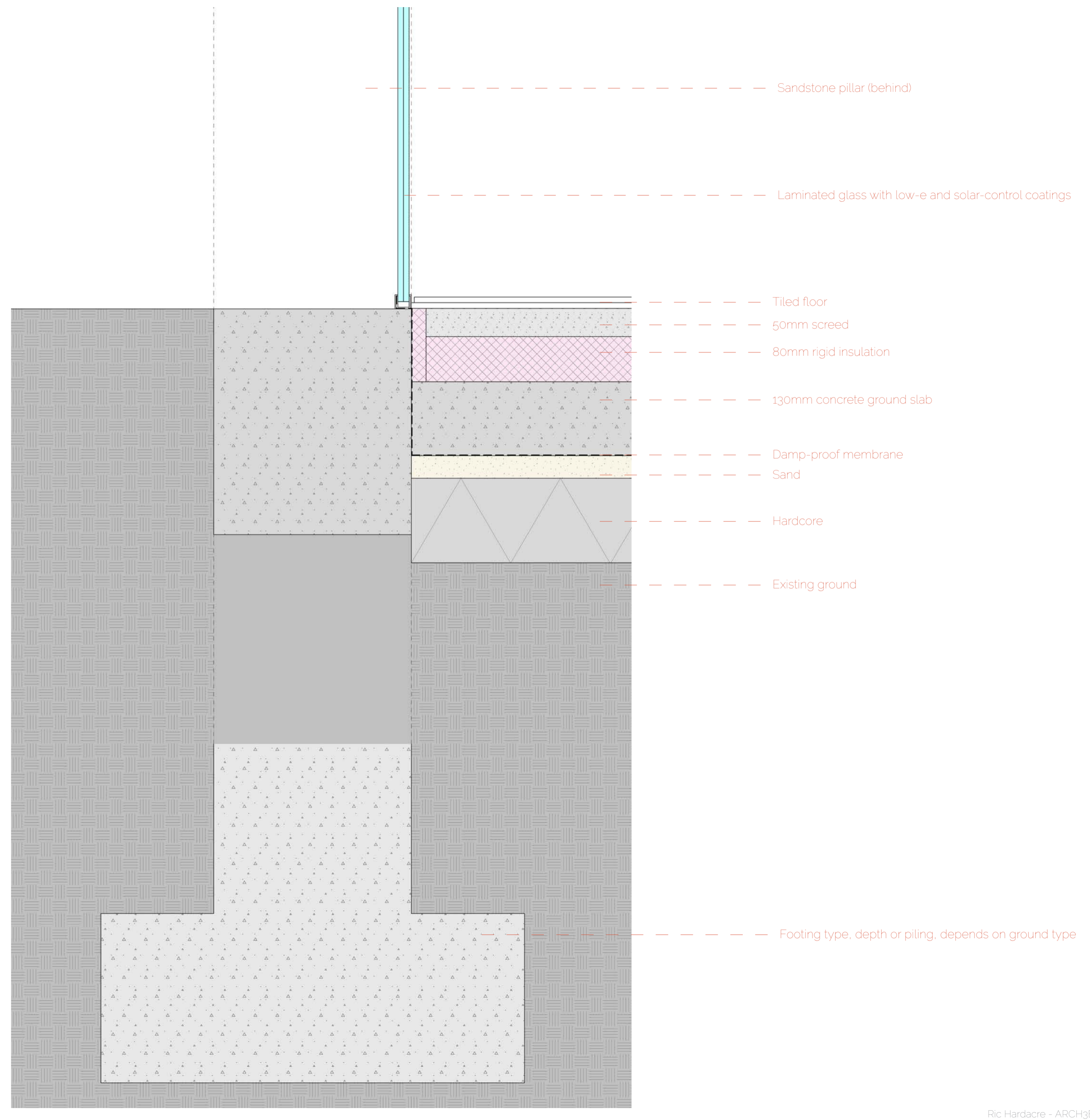
2.5m
1:50 @ A2
42 - Ric Hardacre - ARCH3B



- 12mm plasterboard with vapour barrier backing
- 230mm rockwool
- 75mm rigid insulation
- Damp proof membrane
- Steel lath tied through to timber frame
- Mortar mix with hydrophobic additives
- Services as required
- 35mm water-jet-cut sandstone veneer, grooved to aid bonding
- 230mm timber framing
- Carpet and underlay
- Plywood
- 75mm rigid insulation
- 140mm cast-in-place composite slab
- Damp-proof membrane
- 180x405 castellated universal beam
- 20mm steel mounting l-plate
- 25mm extruded nylon spacer
- M20 anchored bolts in pre-drilled holes
- Insulation surround
- Post-tensioned sandstone beam
- Rockwool insulation
- Plywood
- Suspended ceiling
- Batimet triple-glazed unit



2.5m
1:50 @ A2
0.25m
1:5 @ A2

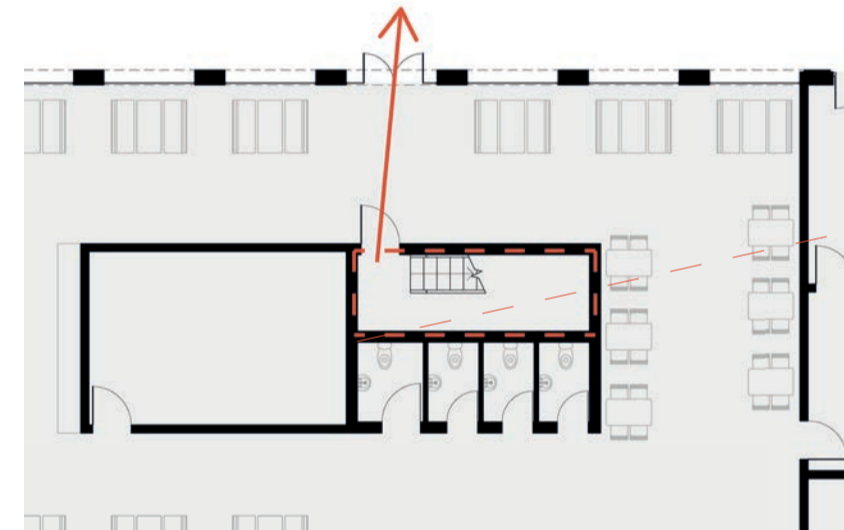


- Sandstone pillar (behind)
- Laminated glass with low-e and solar-control coatings
- Tiled floor
- 50mm screed
- 80mm rigid insulation
- 130mm concrete ground slab
- Damp-proof membrane
- Sand
- Hardcore
- Existing ground
- Footing type, depth or piling, depends on ground type

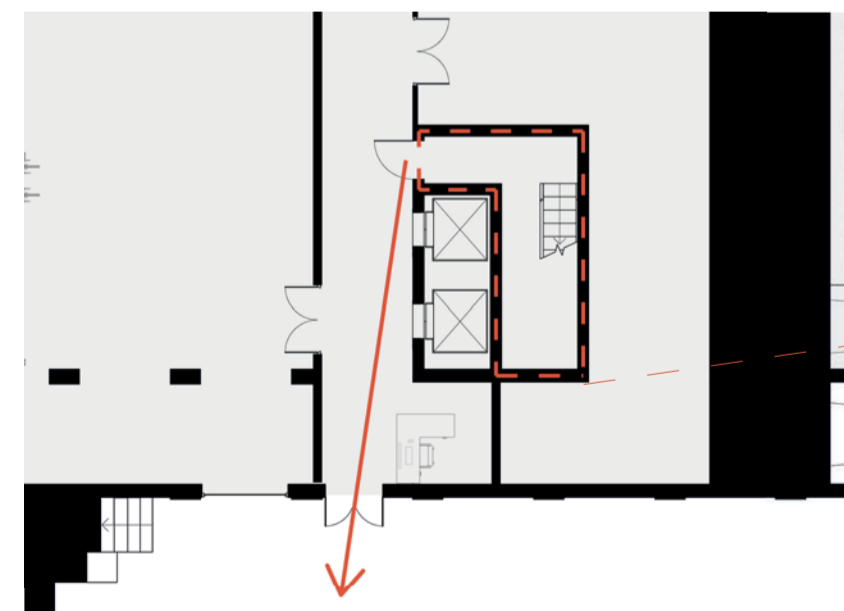
Fire Safety

Approved Document B sets out standards for fire safety. The calculations on this page assume the building is classified as a 'Non-dwellinghouse' and a place for 'Assembly and recreation'. The focus here is on the 1st floor, which due to the 'Library box' has the farthest extents from the emergency stairs.

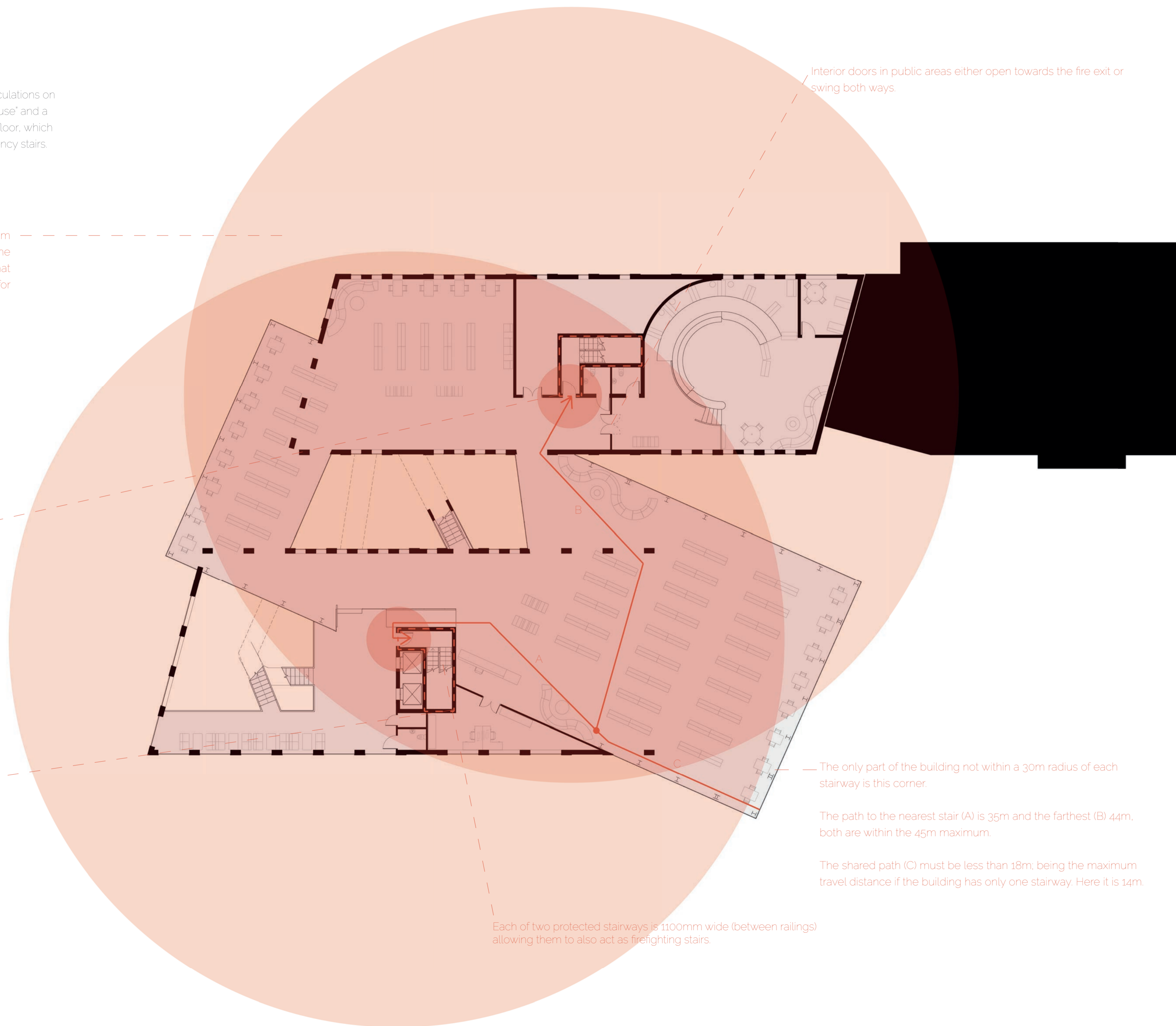
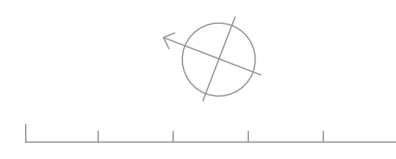
Where two protected stairways are present then the maximum travel distance is 45m. The 'rule of thumb' suggested in the document is that the building is designed using 2/3rds of that value - 30m - in a direct line, with the remainder set aside for moving around obstacles (such as rows of bookshelves).



East stairway exit to Havelock Road at ground floor level.



West stairway exit to Cornwallis Terrace at lower-ground level.



Interior doors in public areas either open towards the fire exit or swing both ways.

The only part of the building not within a 30m radius of each stairway is this corner.

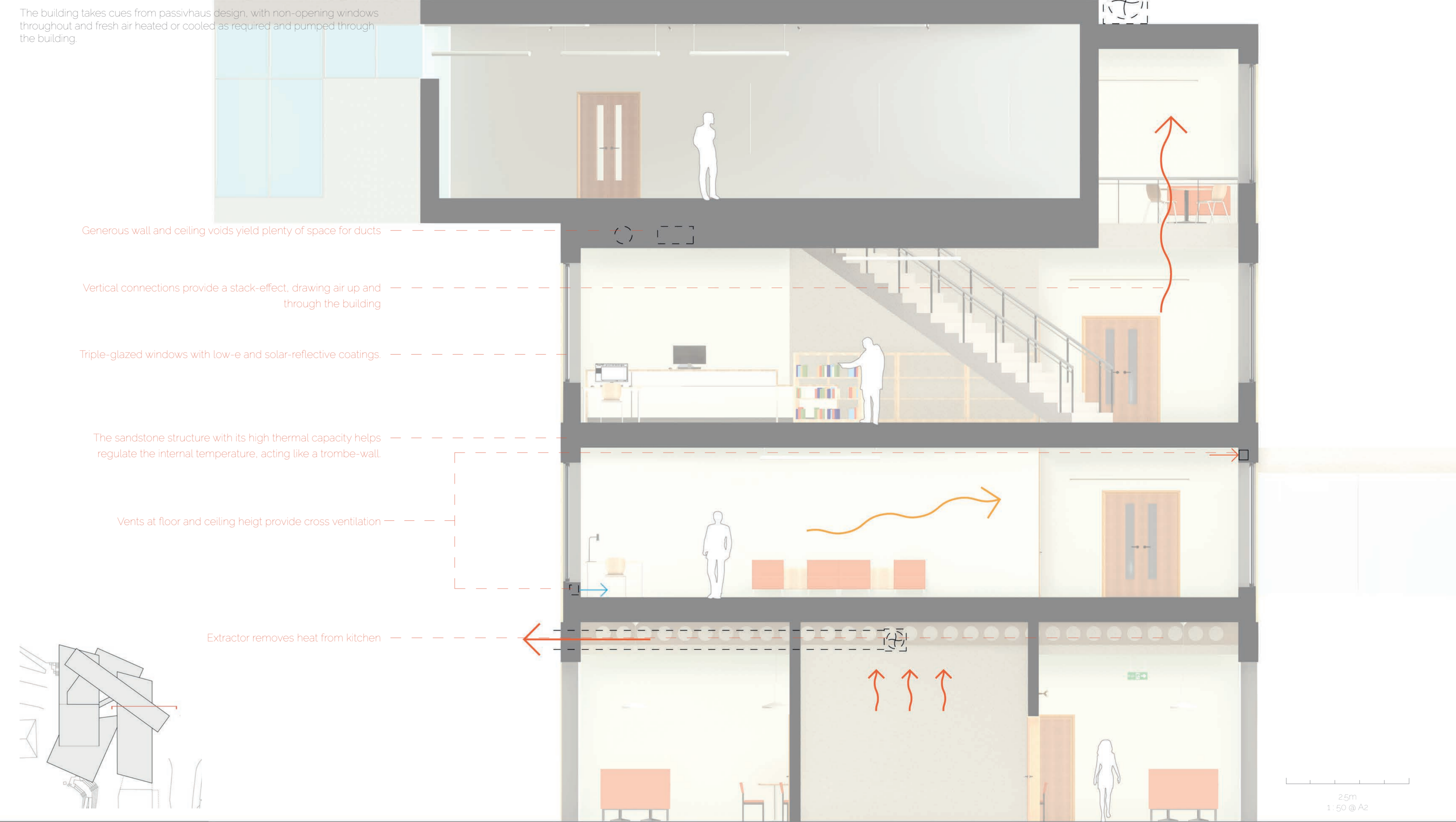
The path to the nearest stair (A) is 35m and the farthest (B) 44m, both are within the 45m maximum.

The shared path (C) must be less than 18m, being the maximum travel distance if the building has only one stairway. Here it is 14m.

Each of two protected stairways is 1100mm wide (between railings) allowing them to also act as firefighting stairs.

Thermal Strategy

The building takes cues from passivhaus design, with non-opening windows throughout and fresh air heated or cooled as required and pumped through the building.



Generous wall and ceiling voids yield plenty of space for ducts

Vertical connections provide a stack-effect, drawing air up and through the building

Triple-glazed windows with low-e and solar-reflective coatings.

The sandstone structure with its high thermal capacity helps regulate the internal temperature, acting like a trombe-wall.

Vents at floor and ceiling height provide cross ventilation

Extractor removes heat from kitchen

Air-source heat pumps on the roof cool or heat fresh air that is then pumped around the building. These are placed in the shade of the adjacent tall buildings to the south.





References

- p9 Hastings library photos - Baxhall Construction
Hastings library floor plans - Millerbourne Architects
Lending statistics - National statistics - Libraries - Taking Part Survey 2019/20
- p25 Coats of arms - Wikimedia
- p33 Building photos - Google images
Hastings Castle - Diana Mower
Hastings Cliffs - Melanie Leng / British Geological Survey
- p36 Sandstone quarrying - Stone Contact
Sandstone saw cutting - Heritage Stone
- p40 Extruded nylon - AI Plastics
Window section - Batimet
- People in renders - Mr Cutout and Cutoutstore
- Gallery art - The Decibel Kid
- Font - Raleway Thin
- Mapping data via DigiMaps / Ordnance Survey
- Cups of tea and infinite patience - Amy Wragg
- Remaining photos and graphics by Ric Hardacre