Architecture

5.1 Functional Uses

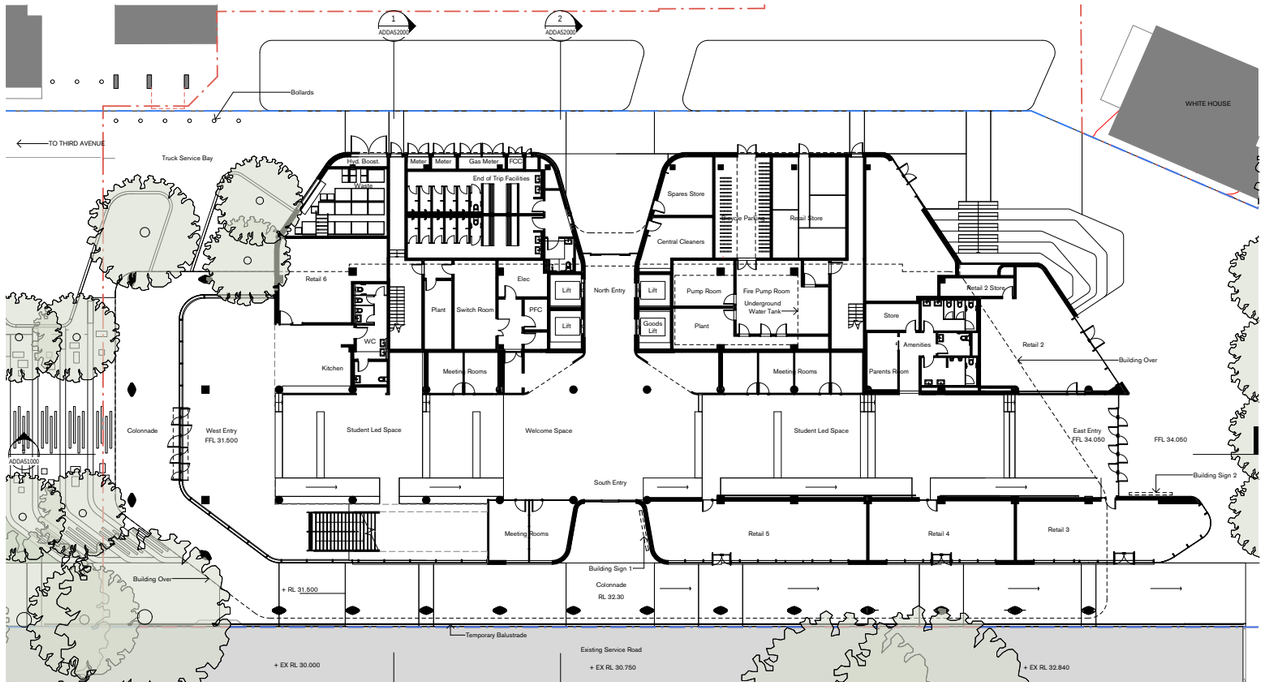
The D14 building will provide a multi-purpose building which is envisaged as a flexible environment allowing functions to change over time.

The ground floor is activated with high activity Student Led spaces and retail which are outwardly focussed and people-friendly. End-of-trip facilities with bike storage and amenities encourage workplace occupants to travel to work with a low carbon footprint.

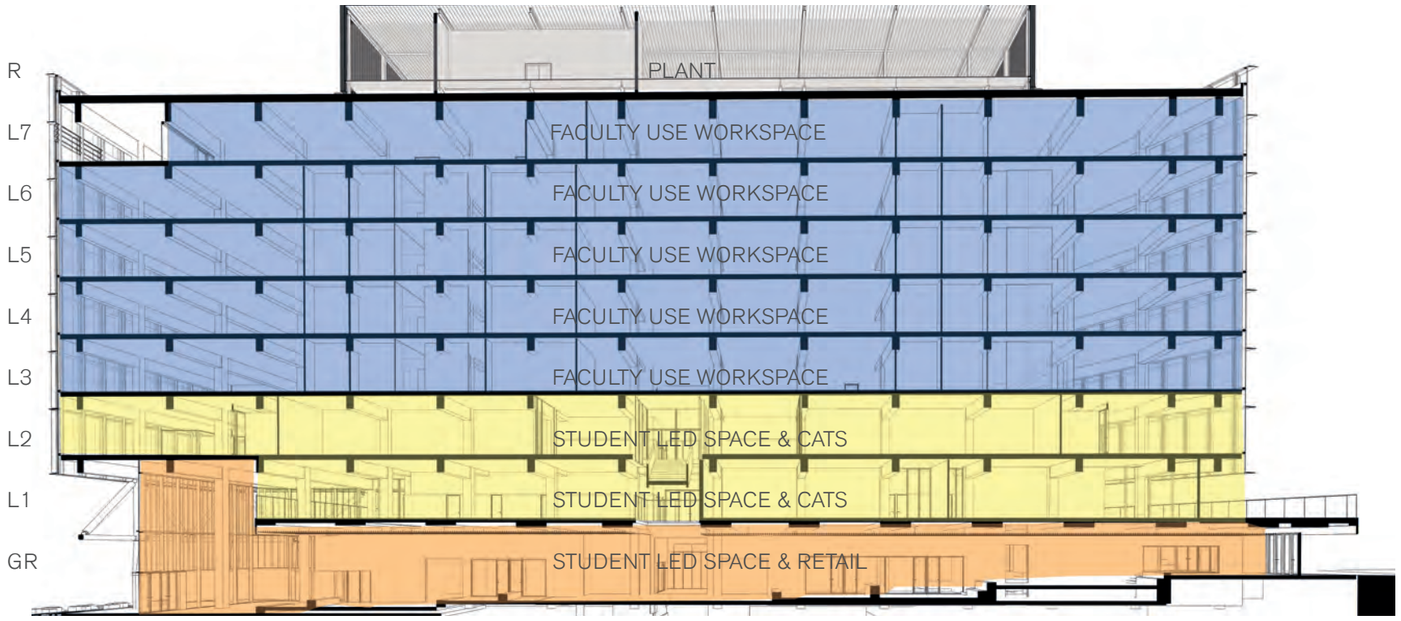
Levels 1 and 2 house centrally allocated teaching spaces (CATS) which are flat floor classrooms designed for maximum flexibility. These spaces are for collaborative and interactive learning integrated with high level AV and IT facilities. These spaces blend in and out of the student Led spaces.

Levels 3 to 7 are dedicated to faculty use workspace allowing occupants to work individually or together as a connected community. The workspaces provide flexibility and diversity and offer a range of working modes and settings. The workplace is not aligned to a faculty or school. It is a place for everyone allowing maximum flexibility of occupants.

The roof level houses cooling towers and plant rooms.



GROUND FLOOR PLAN



3D LONG SECTION DIAGRAM

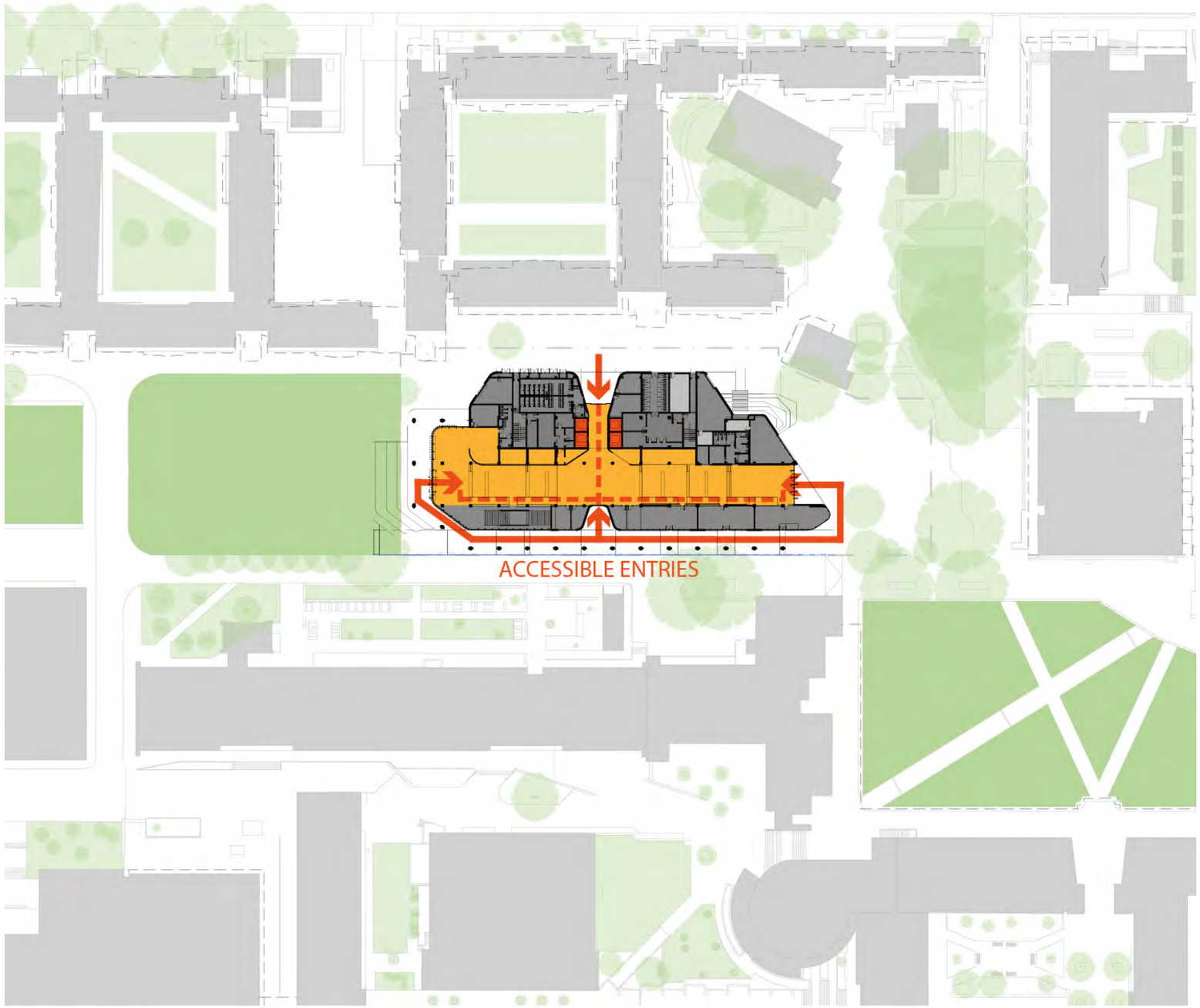
Architecture
5.2 Accessibility

The design will integrate a high degree of accessibility for people with a disability in line with the University's stated aims. The design recognises that delivering equal opportunity to quality tertiary education outcomes for people with a disability will depend, at least in part, on a building that caters for, and provides choice to, people of a variety of abilities.

The design will meet all applicable statutory and code requirements with respect to accessibility. This will include, the provision of accessible entrances, paths of travel, including vertical access, and common facilities.

The design will seek to ensure that way-finding and access to common facilities will be both as safe and as intuitive as possible. The design will strive to provide equal opportunity for both students and staff with a disability to engage in the full anticipated spectrum of modes and styles of learning.

The site rises from west to east. The ground plane accomodates this level change and allows for equal pedestrian route access through a series of carefully integrated internal and external gently sloping walkways. (max 1:20 grade)



Informed by its context, the distinctive architectural character is derived from the authentic use of essential elements such as the timber structure and the need for solar control. The premise is celebrating the timber as the hero through simplicity, efficiency and clarity in expression.

The building exists in two parts: lower ground plane elements and a six storey top.

The lower elements are about providing threshold transitions both horizontally between outside and inside, and vertically in scale. This is accomplished by setting the lower levels back from the building above and providing covered interstitial spaces at the major public frontages of Alumni Park and College Walk, as well as by pushing the lower levels out from the building above and providing a transition in scale at the more intimate frontages of the heritage precinct and the student accommodation. The definition of the base is also informed by the intention to maximise the physical and visual connection to, from and through the site. The six storey top section is maintained as a simple glass skin wrapping around the timber structure, the articulation of which is informed by efficient implementation of its practical requirements resulting in an interplay between solidity, partial and full transparency, balancing the requirements of amenity and solar control.

The unique positioning of D14 within a rich and diverse range of urban conditions affords the opportunity for it to be a genuine landmark within the UNSW campus.

ARTIST'S IMPRESSION OF WESTERN FACADE
ALUMNI PARK FRONTAGE
NOTE: IMAGE SHOWS POTENTIAL FUTURE UPGRADE TO COLLEGE WALK
- NOT PART OF THIS APPLICATION

ARTISTS IMPRESSION FROM SOUTH WEST
LOWER LEVELS SET BACK ON ALUMNI PARK FRONTAGES AND COLLEGE WALK TO PROVIDE UNDER COVER INTERSTITIAL SPACES
NOTE: IMAGE SHOWS POTENTIAL FUTURE UPGRADE TO COLLEGE WALK - NOT PART OF THIS APPLICATION

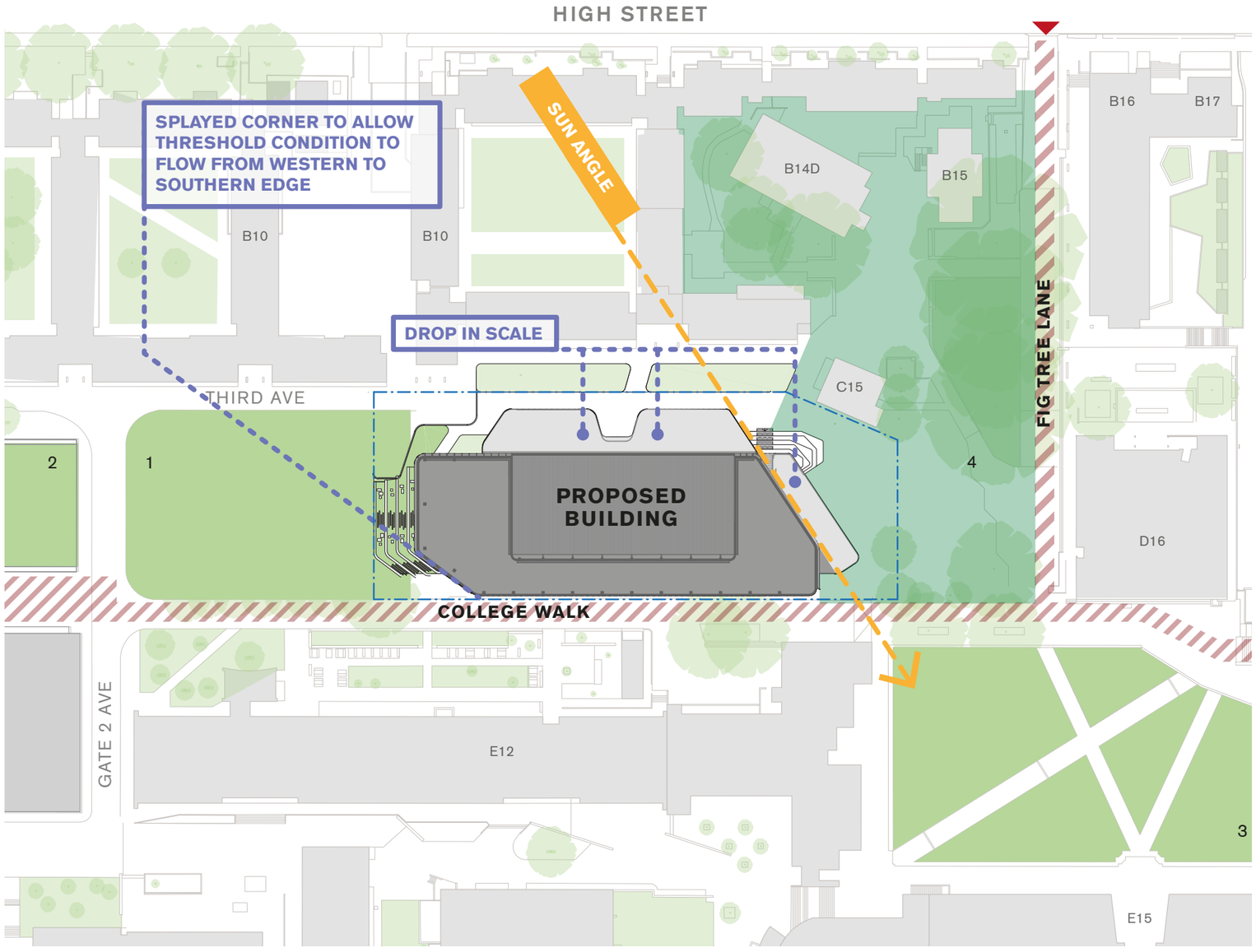
Architecture
5.3 Built Form

The D14 building design emerged from a first principles analysis of a number of key considerations: the urban and site context within the UNSW campus, the project brief, and maximising the efficiencies and potential of mass timber construction.

On the east, the focus is on the spaces created between the buildings. The eastern edge of the building is derived from the 2pm mid-winter sun angle allowing sunlight to the Quadrangle to be maintained and actually improving the overshadowing currently caused by University Hall. This respectfully opens up the building to both The Whitehouse and Fig Tree Lane. This allows the Whitehouse to be experienced as a building in the round, surrounded by beautiful courtyard gathering spaces and a variety of retail opportunities.

Another important open space east of D14 is the pedestrian access to and from High Street. This access point is enhanced by re-imagining the open space leading to the Quadrangle and other parts of the campus, as a landscape walk adjacent to the mature fig trees, on axis and predominantly rectilinear in form.

On the north the building responds informally to the student accommodation. Set back to provide greater generosity and breathing space whilst enabling the transition to a more intimate scale through the stepping down to a low-rise structure, it provides an important transition between the seven storey structure and the more human scaled public domain. The low-rise structure roof offers a large north facing terrace to facilitate the various activities of the learning environment. The space between D14 and the student accommodation also allows for discrete vehicular access for service vehicles. By locating the core on the northern façade, the building passively mitigates a large portion of the heat load impacting the north façade.



Architecture

5.4 Structure

D14 uses a combination of three traditional structural building elements: concrete, timber and steel. The design benefits from the integration of these three materials by taking advantage of each of their unique characteristics to maximise the efficiency of the structure.

The base of the building from the foundations to the Level 1 slab is a concrete structure and this serves several functions. The concrete provides a stiff structure for the connection of mass timber elements above. It distributes the lateral loads from the timber frame into the foundations and contributes to the overall building stability. This eliminates the need for additional diagonal bracing connecting to the ground plane which may be a barrier to free movement of pedestrians thus losing the connectivity that is so important in the ground plane design.

The concrete structure also lifts the timber off the ground plane and protects it from water, termites and damage including impact from vehicles. The concrete provides the necessary fire rating to the ground floor retail. The concrete also provides a program advantage as the concrete works can proceed while waiting for the timber to arrive on site.

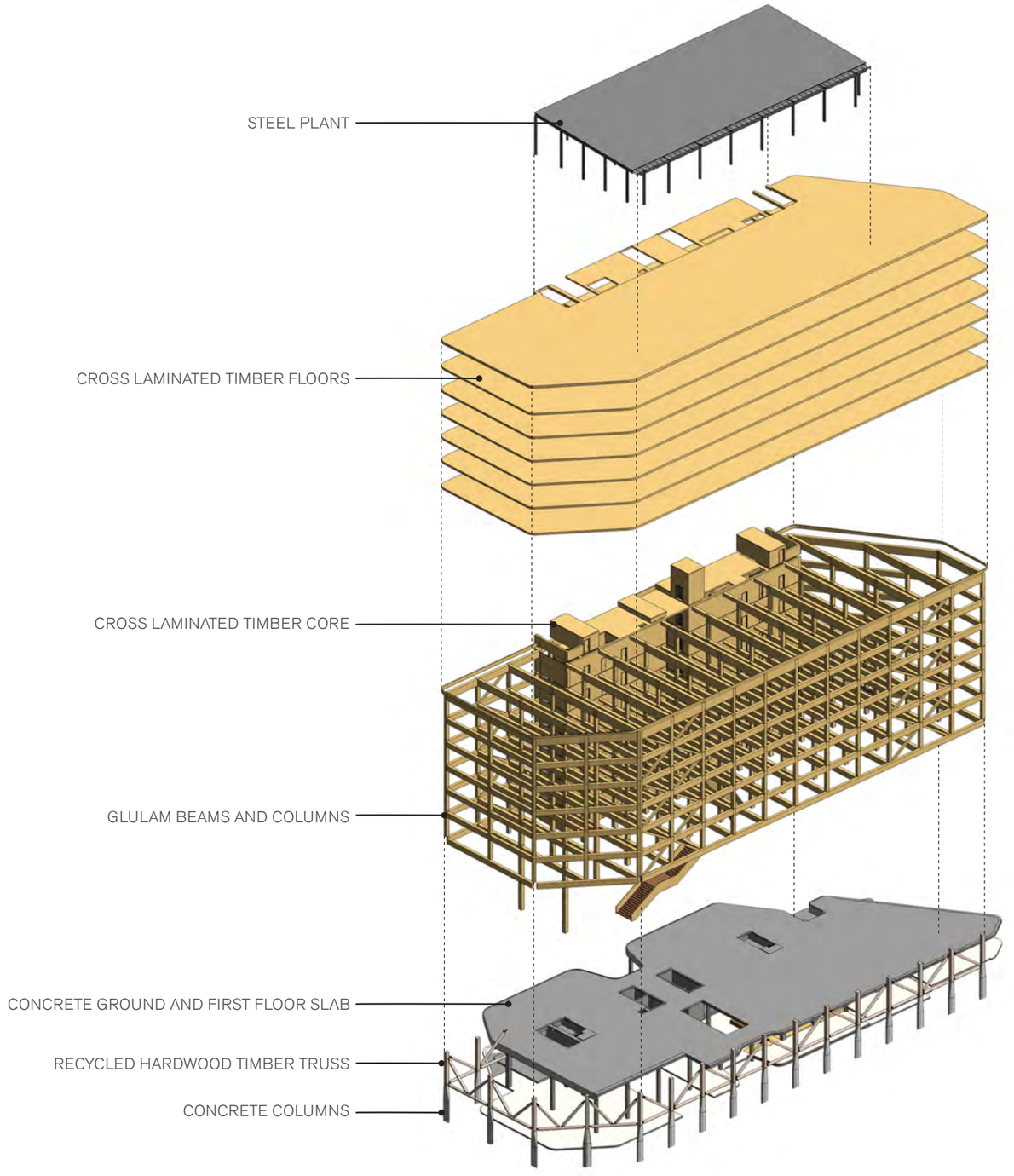
From level 1 to the roof slab, the primary structure is made of engineered mass timber: Glulam is used for the beams, columns and bracing and Cross Laminated Timber (CLT) is used for floors and core walls.

The building's grid is derived from the spanning capacity of the timber structure. It spans 9m in the north-south direction and 6m in the east-west direction.

Angled timber bracing is utilised from L1-L7 within the core and at nominated locations along the southern and northern facades to provide lateral stability to the building. These loads are transferred to the concrete structure either directly at the level 1 concrete slab or through a recycled hardwood truss into cantilevered concrete columns along the colonnade. This truss mirrors the materiality of the internal structure above within the public realm and represents the pragmatic function of the structure.

Two double height timber feature columns reach the ground floor plane at the western end of the student led space facing Alumni Park. All other columns within the ground floor space are concrete.

The roof plant enclosure is a lightweight steel structure. This minimises the structural depth of the roof and loads transferred onto the timber.



Architecture

5.5 Materiality

The materiality of the building strongly relates to the sustainability objectives and principles of UNSW.

The primary structure is made of engineered mass timber: both in the form of Glulam and Cross Laminated Timber. This innovative technology is a sustainable alternative to traditional reinforced concrete construction. This forms the interior primary structure from level 1 to the roof including fire stairs and lift shafts.

All external timber elements, including the exposed truss on level 1 are proposed to be made of recycled Australian hardwood for durability and resistance to weathering.

The internal timber structure is wrapped in a low iron double glazed, high performance glass curtain wall which maximises the visibility of the timber structure behind.

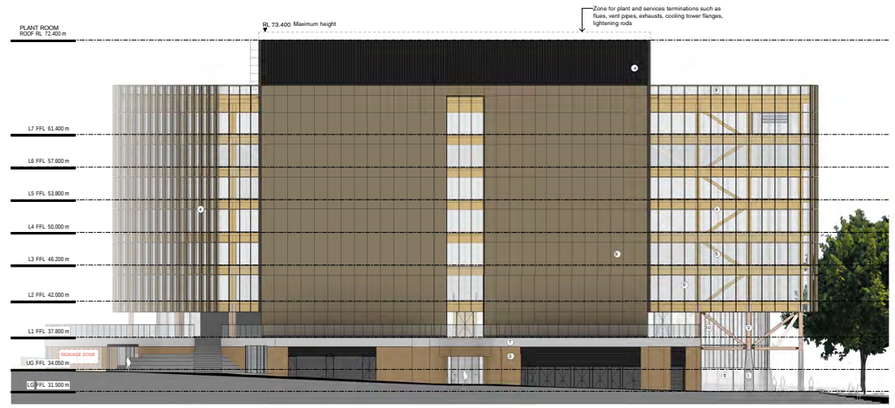
The glass curtain wall facade from level 2 to the roof, consists of full height glass panels on the western, southern and eastern facades and a portion of the north facade. The remaining portion of the north facade is clad with a solid panelised curtain wall system.

The use of engineered mass timber as a construction material maximises the benefits of prefabrication, and leverages the efficiency and precision of CNC fabrication for rapid assembly.

Concrete columns span from ground to level 1 to provide separation between the timber and the ground thus protecting it from water, termites and damage.

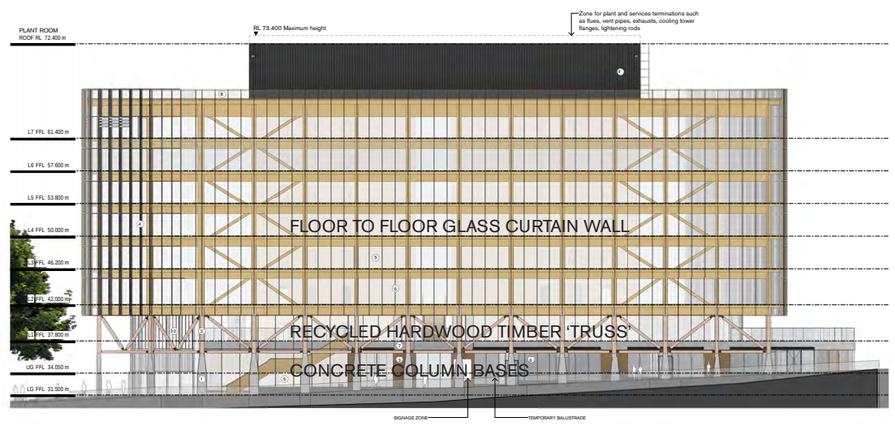
The ground level volume is defined by a panelised cladding material and face brickwork. the cladding forms a ribbon around the perimeter of the Level 1 slab edge and a cap to the textured face brickwork below. This brickwork zone weaves in and out of the ground level volume and is punctuated by various fenestration conditions unified by a consistency in language and detailing.

EAST ELEVATION

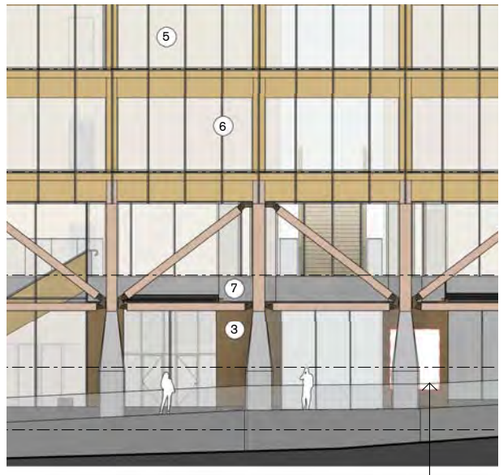


NORTH ELEVATION

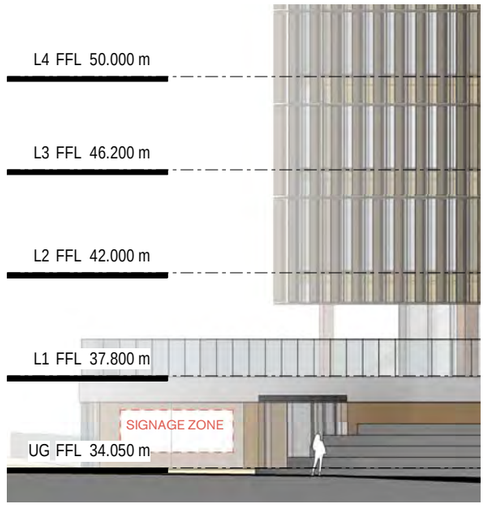
WEST ELEVATION



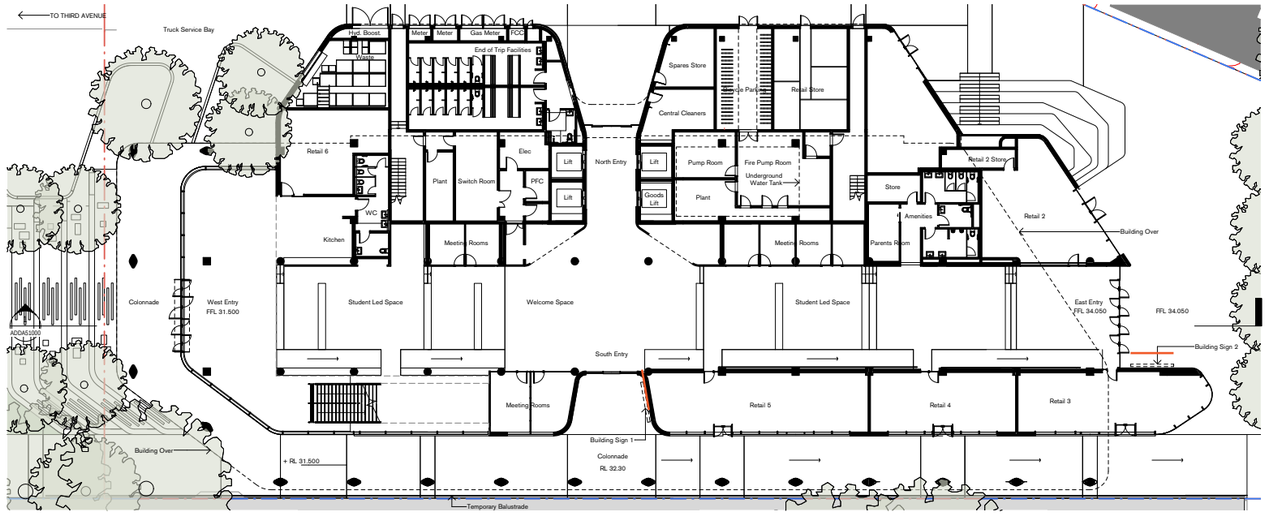
SOUTH ELEVATION



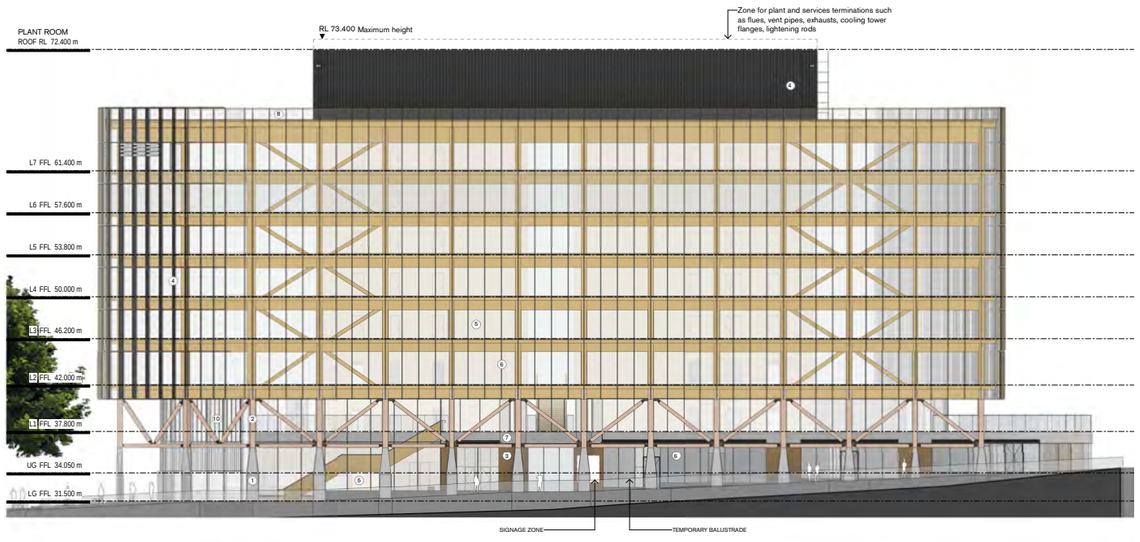
SOUTH ELEVATION - SIGNAGE ZONE



NORTH ELEVATION - SIGNAGE ZONE

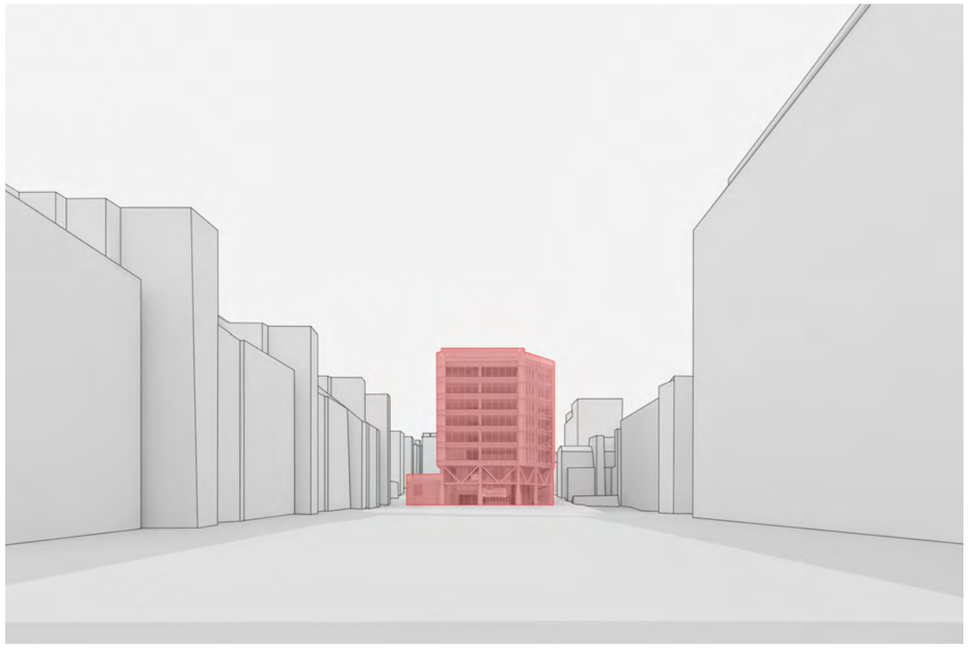


GROUND PLAN - SIGNAGE ZONE

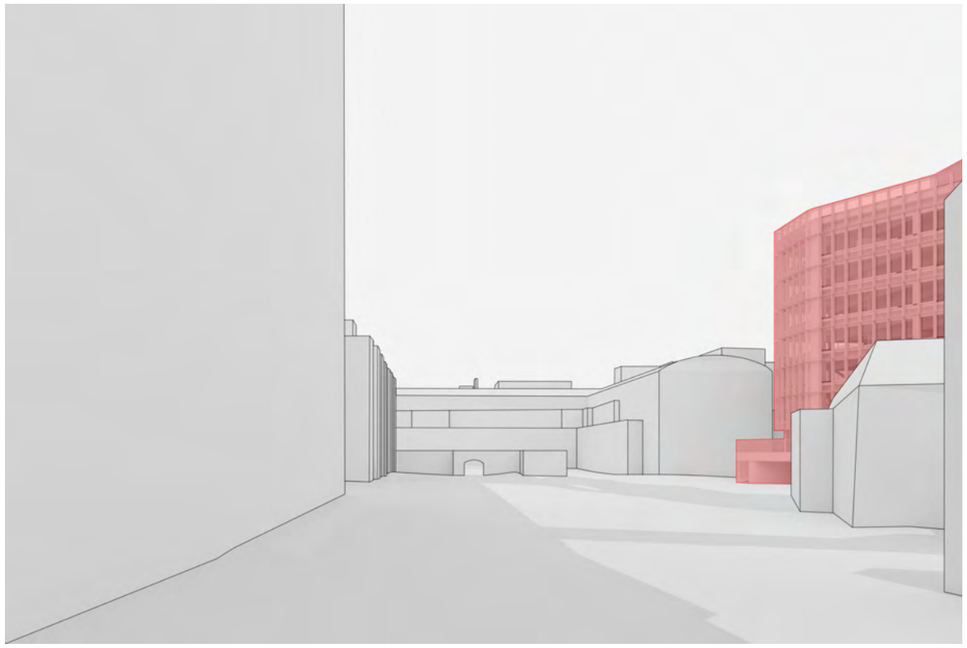


SOUTH ELEVATION - SIGNAGE ZONE

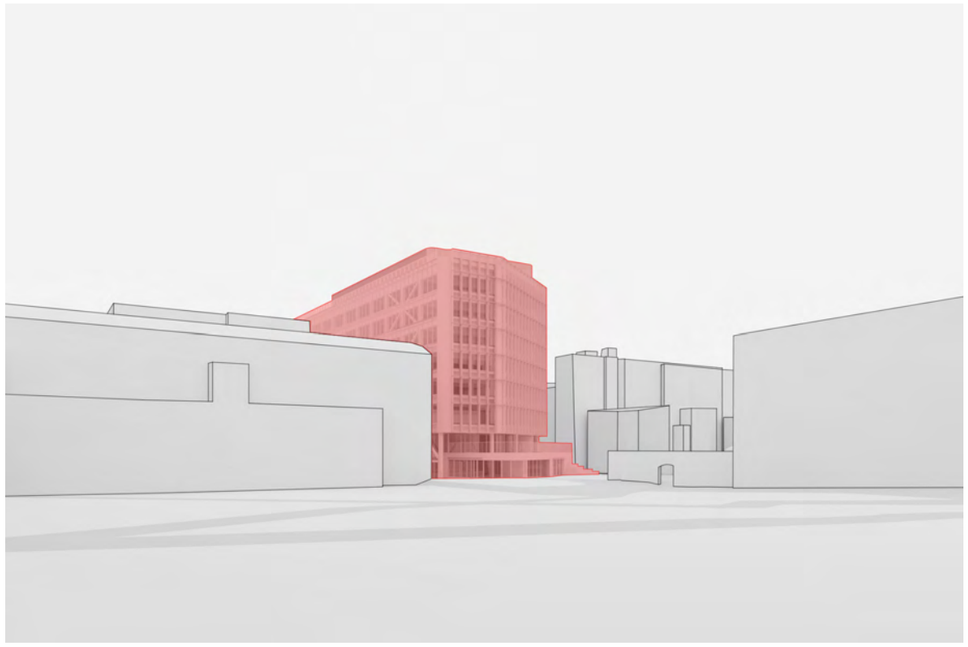
NORTH ELEVATION - SIGNAGE ZONE



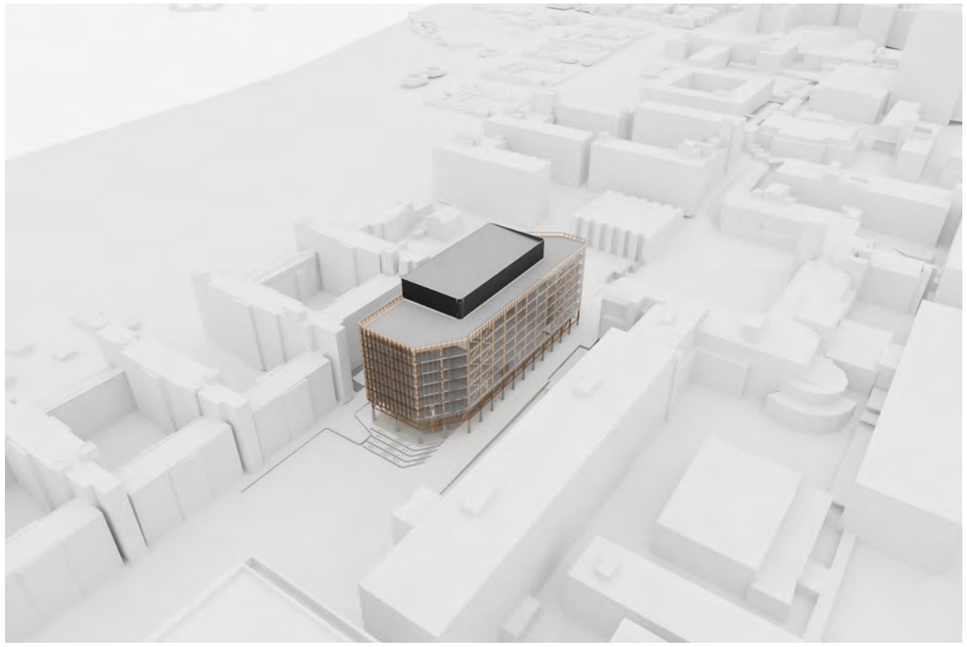
01. VIEW FROM WEST END OF ALUMNI PARK



02. VIEW FROM FIG TREE LANE NEAR HIGH STREET



03. VIEW FROM QUADRANGLE SOUTH EAST CORNER



04. AERIAL VIEW - SOUTH-WEST

06 Response to SDRP and ‘Better Placed’

06

Response to SDRP Comments

1. Site Strategy generally

Comment

"The proposed building effectively addresses the Whitehouse and Fig Tree open spaces to the north east and the UNSW Quadrangle to the south east through arrangement of external circulation, building massing and program. The single storey 'satellite' building to the eastern end of D14 housing a retail/hospitality use shows respect in its scale to Goldstein Hall and will activate the key junction of College Walk and the University Quadrangle with Fig Tree Lane."

Response

Ongoing design development has further enhanced ground level connectivity between Alumni Park, College Walk and Fig Tree open spaces by continuing the ground floor Student Led Space across the entire ground plane from west to east, stepping up through a series of occupied platforms in response to the site topography. The single storey 'satellite' building proposed to the eastern end of D14 has been absorbed into the building footprint, further opening up the space between D14, Goldstein Hall and the Quadrangle. The eastern alignment of the tower element has been further profiled and refined to reach towards and have a relationship with the western corner of the Quadrangle, extending the colonnade further east along College Walk. The north-east façade directly addresses the Fig Tree precinct to the north-east whilst retaining solar access to the Quadrangle to the south-east. A single storey terrace extension to the east on level 1 maintains a transition of the tower massing to the adjoining open space and Whitehouse / Goldstein Hall.

2. Wayfinding and external circulation

Comment

"The main lift entry and vertical circulation path through the building is currently accessed through an open, north/south corridor bisecting the floor plan at ground level. The panel expressed concerns at this 'through site link' around entrance legibility, safety and amenity. The corridor is currently approximately 2.5m wide and generally one storey tall, limiting sight lines for people exiting the lifts; it is currently unclear whether there is a principle entrance."

Response

The original external 'through site link' has now been incorporated within the internal ground floor space, delivering a unified and diverse 'grand public room' across the ground plane. Enclosing this connecting link, provides safer and more secure movement through the building and direct connectivity between all student and faculty activities. Entrance legibility from the colonnade has been developed though the articulation of the entrance with a curved inset facade at ground level and level 1 expressing an obvious and generous entry point. Additional building entry points are provided east, west and north to deliver clear way finding from any approach direction.

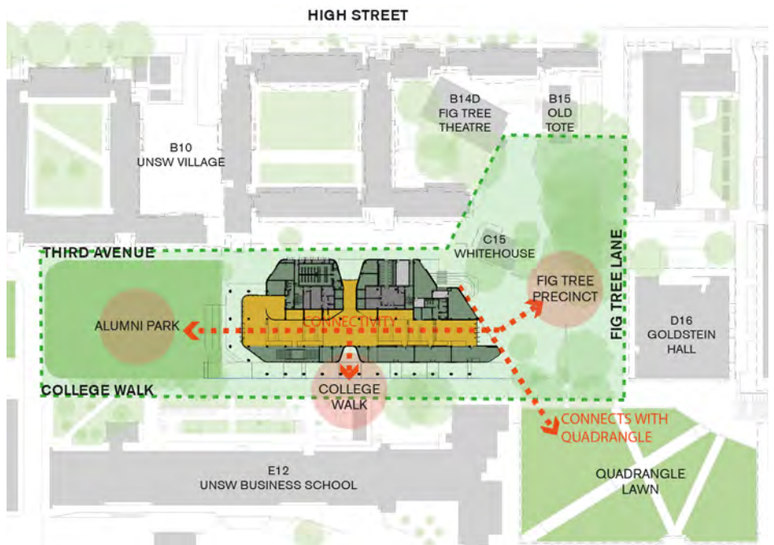
3. Internal planning and circulation

Comment

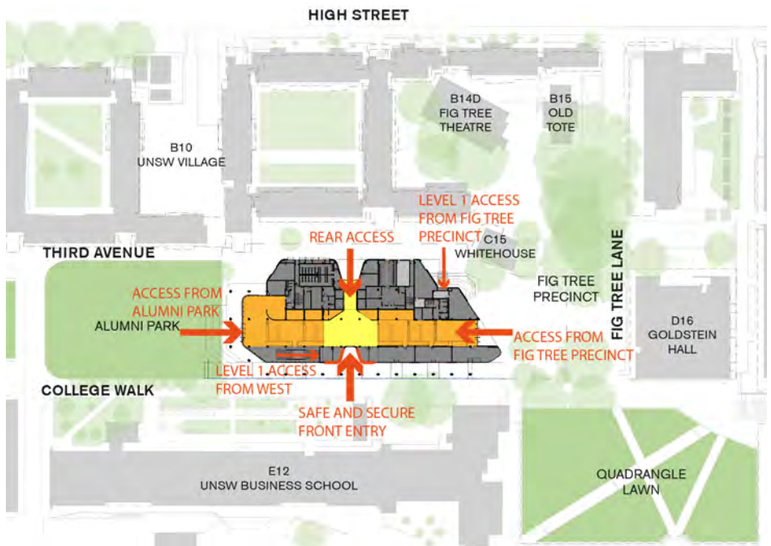
- *"The panel is concerned, that the student led space does not fully engage with the outdoor spaces to the west of the building, terminating Alumni Park."*
- *"There are concerns around the need to leave the building interior to access the lifts from the student led space."*
- *"The Internal circulation stair between Ground and Mezzanine levels is supported but could benefit from further consideration of how it engages with the upper and lower level spaces it links."*
- *"The terraces at L1 currently feel isolated from active interior spaces and may benefit from a direct connection via external stairs from ground level."*
- *"The plan of the typical faculty floors presents challenges with regards daylight and natural ventilation, given the 27m deep floor plate."*

Response

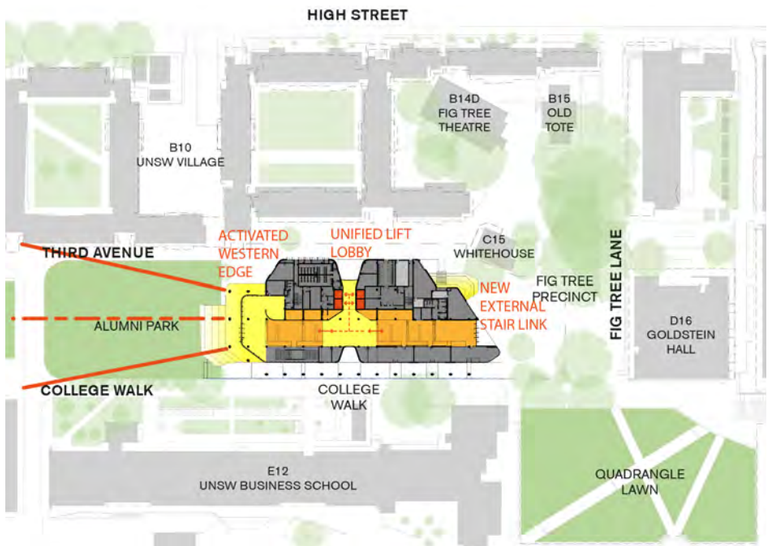
- The western edge of the ground plane will be activated with eating lounges, retail tenancy and social spaces to engage with the outdoor space. Beyond the facade, loose furniture is proposed for the terrace and the landscaped steps furnished with integrated seating to populate these desirable student social spaces.
- The Lift Lobby is now unified with the internal Student Led Space.



PROPOSED GROUND PLAN - GROUND LEVEL CONNECTIVITY



PROPOSED GROUND PLAN - ENTRANCE LEGIBILITY, SAFETY AND AMENITY



PROPOSED GROUND PLAN - ACTIVATED WESTERN EDGE AND UNIFIED LIFT LOBBY

Response to SDRP

- Level 1 has been amended to include CATS and a “gallery space.” The Internal circulation stair from the west provides a direct link from the ground floor student led space to the level 1 “gallery.”
- A new external stair link in the north east corner orientated towards the Fig Tree precinct and Gate 4 creates an additional connection point between ground and Level 1
- The Level 1 façade has been pulled back to the east allowing connectivity between the landscaped northern terraces and more open eastern terrace for looking over Fig Tree precinct and Whitehouse.
- The potential for natural ventilation throughout workplace levels was revisited with UNSW, however issues with management of a mixed mode system and poorly designed precedents have negated this opportunity. Daylight studies have confirmed excellent daylight autonomy levels (being a minimum of 160 lux from daylight for at least 80% of business hours) of 58%, with >40% being ‘acceptable’ and >60% ‘ideal’.
- Pivot door system introduced to encourage permeability

4. Sustainability: Building performance and thought leadership

Comment
“The D14 building presents a number of challenges around thermal comfort, internal amenity and energy use:

- *Large glazed facades facing west to all floors*
- *Deep floor plates requiring heavy reliance on mechanical ventilation and artificial lighting*
- *Inoperable facades creating reliance on HVAC rather than fresh air*
- *Sunshading currently shown is not considered adequate to achieve internal comfort*
- *The panel mentioned BIPV [Building Integrated PV] as one possible means to address overheating and energy use.*
- *Regarding the timber structural components, the panel recommends sourcing the frame within Australia to reduce the embodied energy of the structure.”*

Response

- D14 is targeting a 6 star Greenstar rating.
- Level 2-7 facades on the west, north and east have double glazed high performance glass and both horizontal and vertical external shading as well as internal blinds. Additional external sun shading louvres have been added to the double height Student Led Space on the ground and first floor on the west to reduce heat load in that area.
- Deep floor plates are a necessity of the brief management for maximum future flexibility and width for teaching and learning spaces. The glazed facades maximise natural light penetration.
- Sunshading has been confirmed as adequate by ESD analysis.
- BIPV was further explored, however the efficiency was lower than a roof mounted system and also created maintenance complications.
- The timber for the colonnade elements is proposed to be recycled Australian hardwood. The Glulam and CLT structure are sourced from overseas as Australia does not currently have the capacity to produce the volume and size of structural members required within the time frame required.

5. Built Form and user experience

Comment
“The panel urges the team to explore taking the primary timber structure closer to ground – the tall concrete column bases could be reduced in height to enable close visual and even physical contact with the timber elements from ground level.”

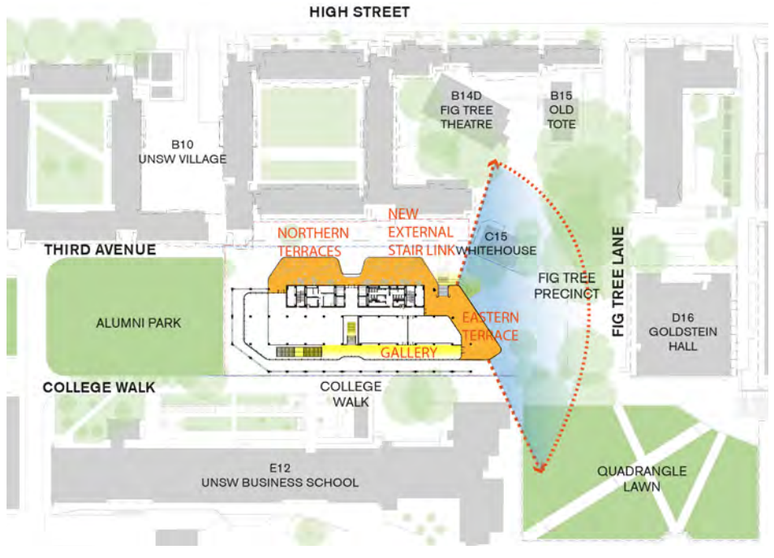
Response
The tall concrete bases address several issues:

1. They provide a robust element close to the ground plane which will be subject to most damage, wear and tear.

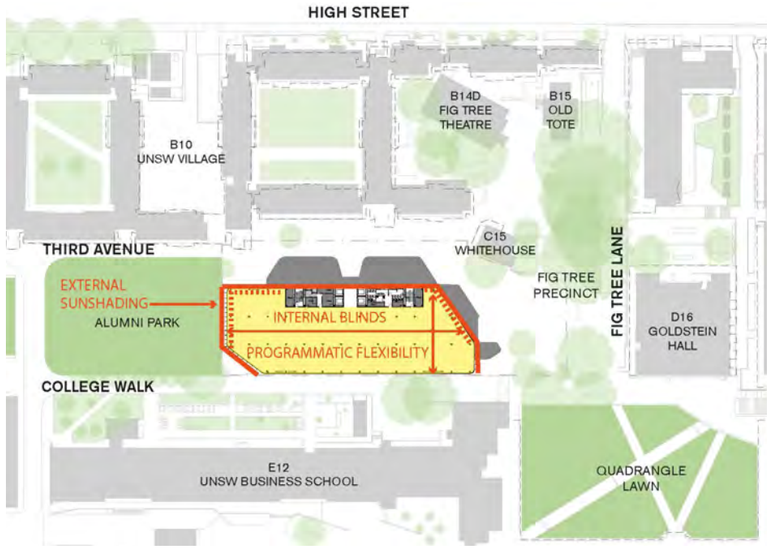
2. Provide the necessary strength to withstand vehicular impact.

3. Provide a constant top datum that rationalises the 4.5m level change across the site.

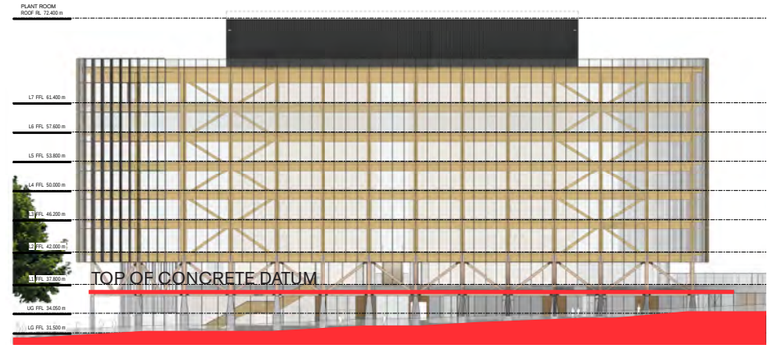
4.Protect the timber structure from exposure to termites.



PROPOSED LEVEL 1 PLAN - CONNECTIVITY



PROPOSED LEVEL 3 PLAN - SUNSHADING AND PROGRAMMATIC FLEXIBILITY



PROPOSED SOUTHERN ELEVATION

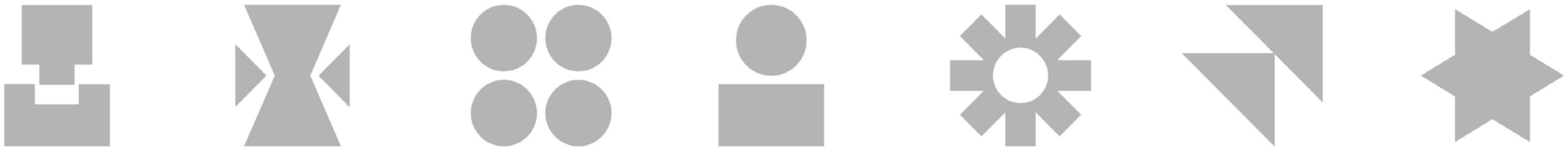
Response to ‘Better Placed’ Document

Response to *Better Placed* Document

‘Design Excellence’ has been the primary goal of the design team and has been achieved through an intensive and rigorous design and critique process.

The Better Placed document, an integrated design policy for the built environment of New South Wales, defines the key considerations in the design of the built environment through seven distinct objectives.

These objectives support the design approach to the D14 CLT building to achieve high quality design and to ensure a healthy, responsive, integrated, equitable and resilient built environment.



01. Better Fit – Contextual, local and of its place

D14 has been designed to nestle within the avenue of historic fig trees to the North East, the fully glazed West of the structure overlooks Alumni Green, whilst guiding foot-traffic along its impressive south façade and colonnade which lines the (future) bustling College Walk. The open plan and nature of the building provides the generous North-South thoroughfare through the centre of the buildings ground floor encouraging pedestrians to utilise it within their journey around campus.

02. Better Performance- Sustainable, adaptable and durable

The buildings prominent timber structure is the obvious response to the importance of environmental sustainability. The carbon storing timber structure is durable in its construction performance, sustainable in its production and adaptable in its end of life. In addition the roof holds PV cells producing solar energy to provide power to the building, whilst the harsh sun is mitigated to provide comfort to the buildings user through external solar shading and a high performance double glazed façade.

03. Better for Community – Inclusive, connected and diverse

Open plan design inspires collaborative work amongst building users throughout. Retail outlets and a self-service kitchen are provided on the ground floor for the convenience of building users and passers-by. Landscaped surrounds and terraces provide a variety of seating types, as well as interior seating options for students, staff and visitors. Student lead spaces provide for small and large groups in a range of settings – social and quiet. Faculty use floors inspire formal and informal meetings, and focused and collective work. Garden terraces at the top of the building provide a space for social activities and gatherings.

04. Better for People – safe, comfortable and liveable

The multi-use space requirements of D14 have been expertly considered to allow for all. The expansive double height social spaces, collaborative study spaces and larger meeting rooms provide a vibrant student lead area in the open public spaces of the Ground Floor. Floors above cater to a more tranquil setting, with a quiet room for time out, intimate bookable spaces and relaxed contemplative zones. Floors above that are facilities catering specifically to faculty and administrative requirements. An assortment of spatial provisions separated by secure means, meet the needs of a diverse range of end users, within the consolidated boundaries of one built form.

05. Better for Working

Glazed facades provide not only a beautiful building from the outside, but deliver the buildings users with an abundance of natural light within the interior spaces. The natural surrounds are brought into the building through floor to ceiling outlook over the green spaces and tree canopies surrounding D14. Workstations, informal meeting areas, contemplation space and social zones are all situated towards the outer zones of the floor plate to harness the tranquility of the natural environment encouraging better work practices.

06. Better Value

D14 has been designed with adaptability in mind. A building serving several purposes and needs of the University over the short and long terms - the workspaces particularly have been designed in a generic way to serve and enhance multiple uses. The quality of the all-encompassing base structure remains robust, timeless and recognisable, while the interiors have the capacity to adjust to faculty requirements providing a valued structure that grows with the university.

07. Better Look and Feel

Striking in its appearance, the innovative use of timber in an urban setting dominated by concrete, provides a softness to the built environment landscape on campus. The intrigue of the building lures users inside to discover the aesthetic qualities of its communal interiors spaces. The tactile nature of the timber structure is continued right through the building within its core walls, ceilings, columns and even stair balustrades – providing an overall experience beyond that of just a visual offer.

07 Sustainability

07