



5.0

Urban Design

5.1 School Campus Connectivity

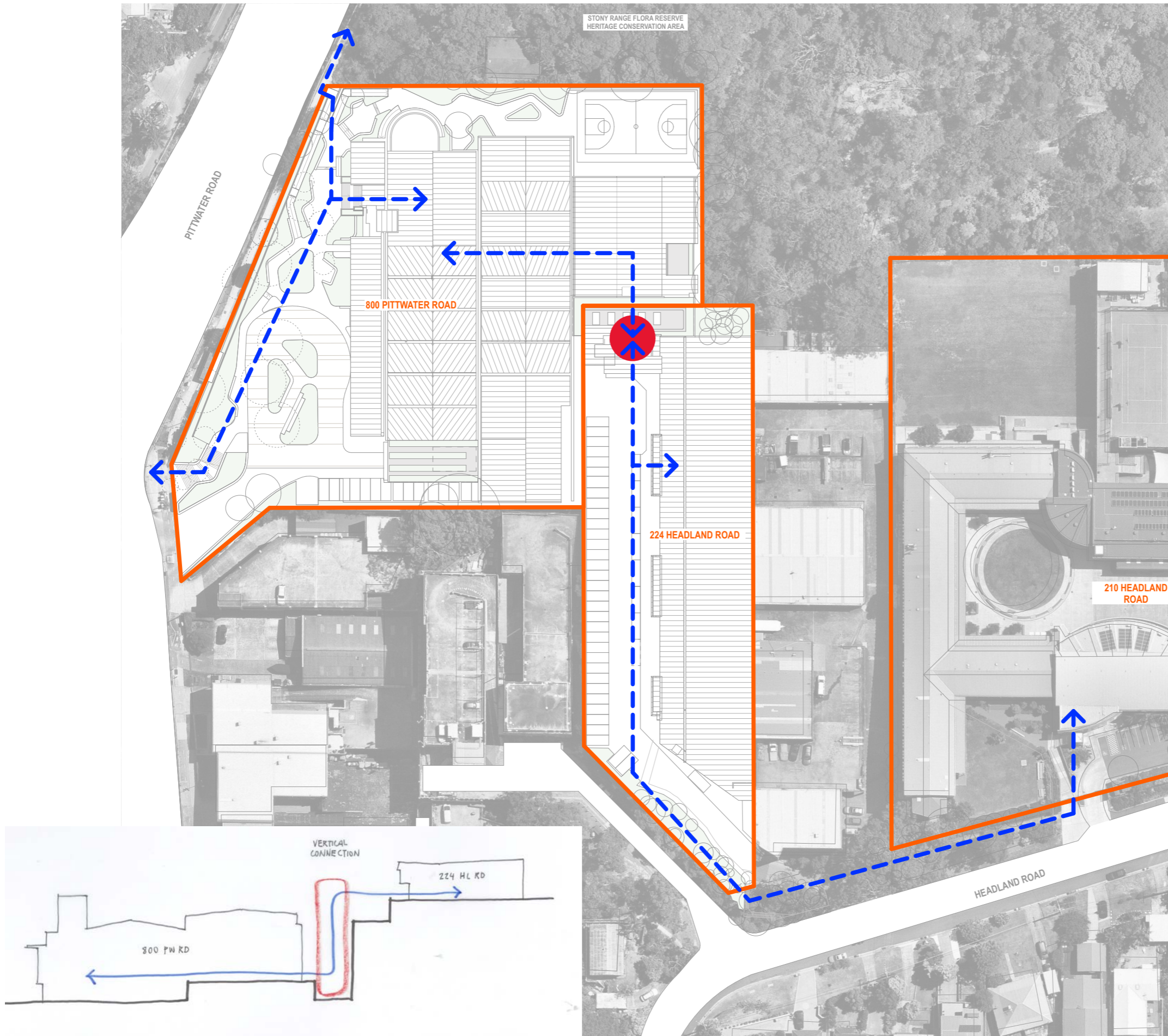
A vertical connection link is proposed between the buildings on 800 Pittwater Road and 224 Headland Road.

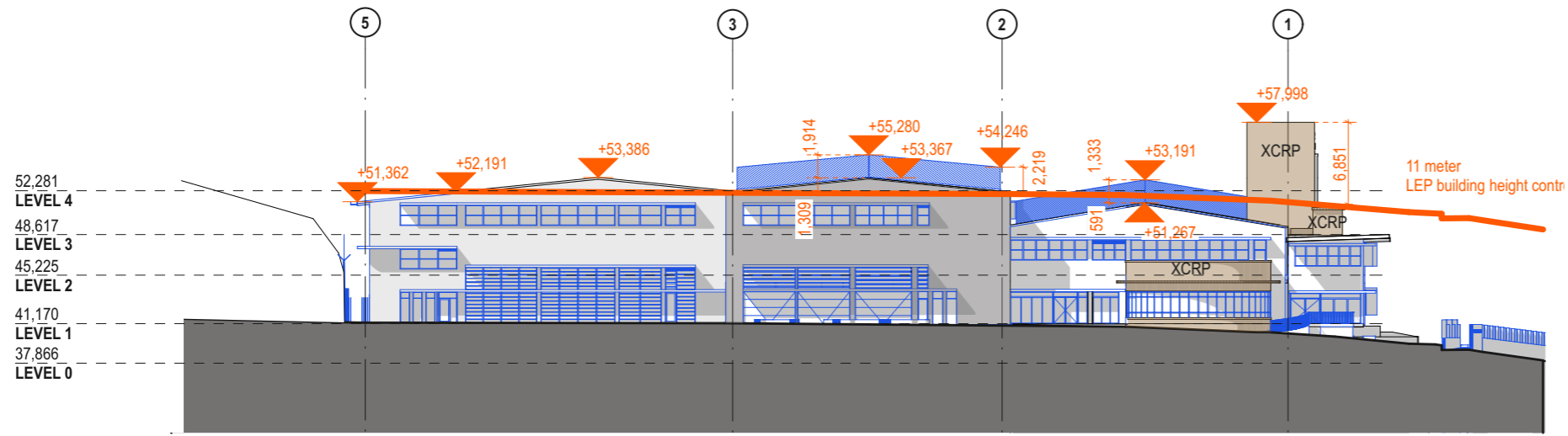
This new building will provide an internal accessible link throughout all levels of 800 Pittwater Road connecting to a covered walkway linking into the Ground Floor of 224 Headland Road.

The link between 224 Headland Road and the existing campus on 210 Headland Road is proposed to be upgraded by providing a new stairway connecting the Headland Road footpath and the driveway on 224 Headland Road. this upgrade is not part of this SSDA, but has been lodged with Northern Beaches Council with DA2019/977, submitted 09.09.2019.

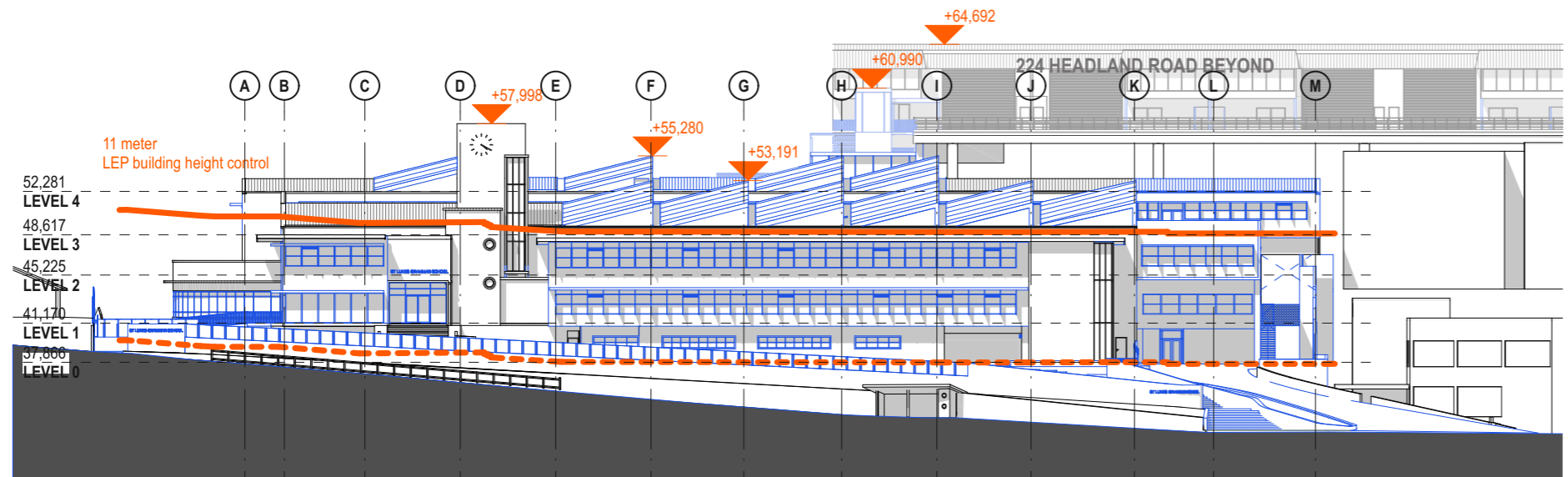
Currently the pedestrian access to 224 Headland Road is via the shared driveway only and a blind corner at the bottom of the driveway poses a risk to pedestrians.

The proposed upgrade will improve access by removing the blind spot.





North Elevation



West Elevation

5.2 Building Height

To provide sufficient natural light to the 'village centre' and the centrally located GLA's, we propose to introduce saw-tooth skylight structures across the western and central roof sections.

These structures will extend past the LEP height limit of 11 meters, but have minimal visual impact due to the set-back location of the skylights.

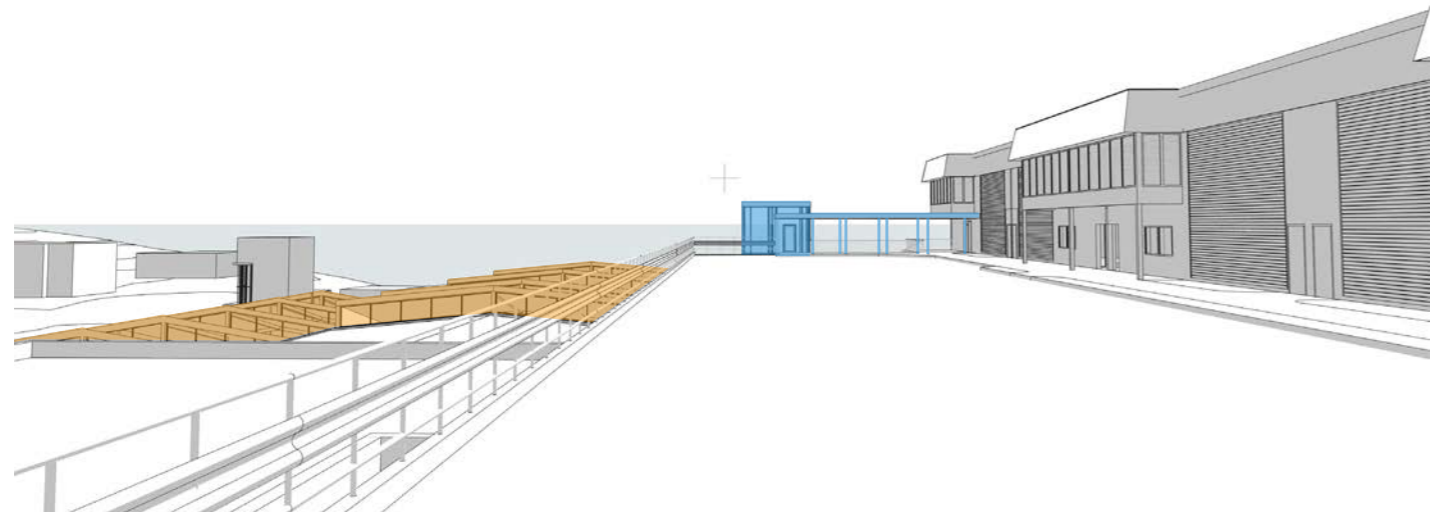
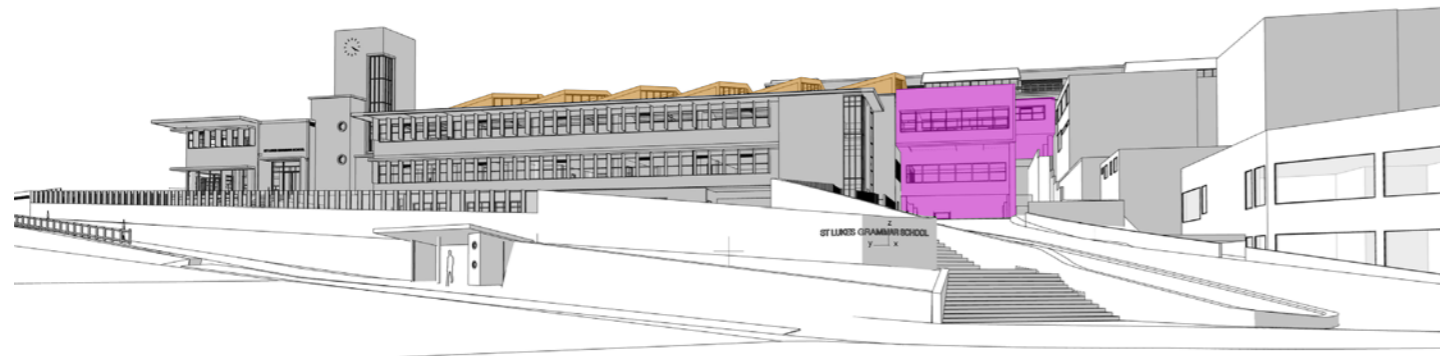
The existing building, including the heritage clock tower, also already surpasses the height limit by more than 6 meters.

The new roof structures will lift the roof line by 2 meters at their highest point.

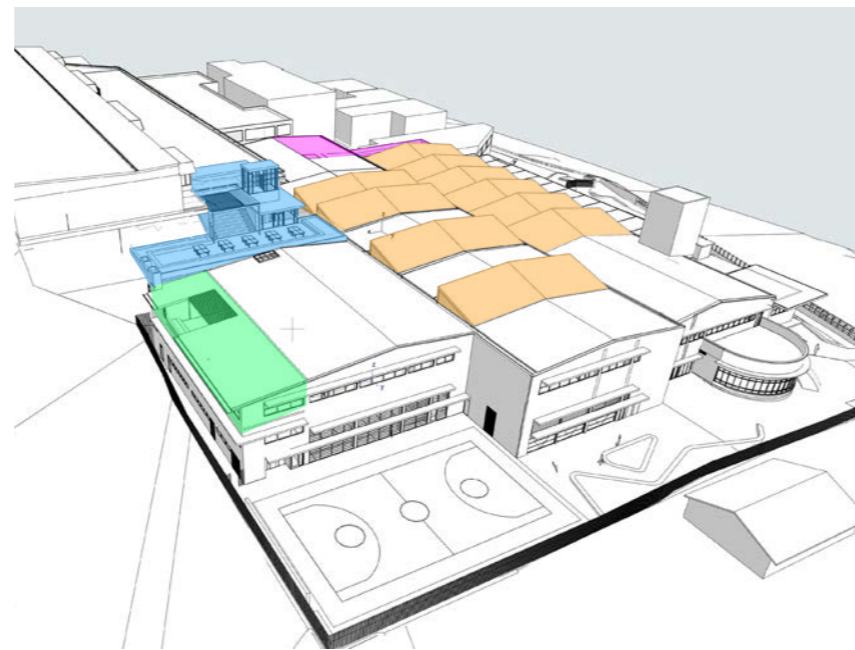
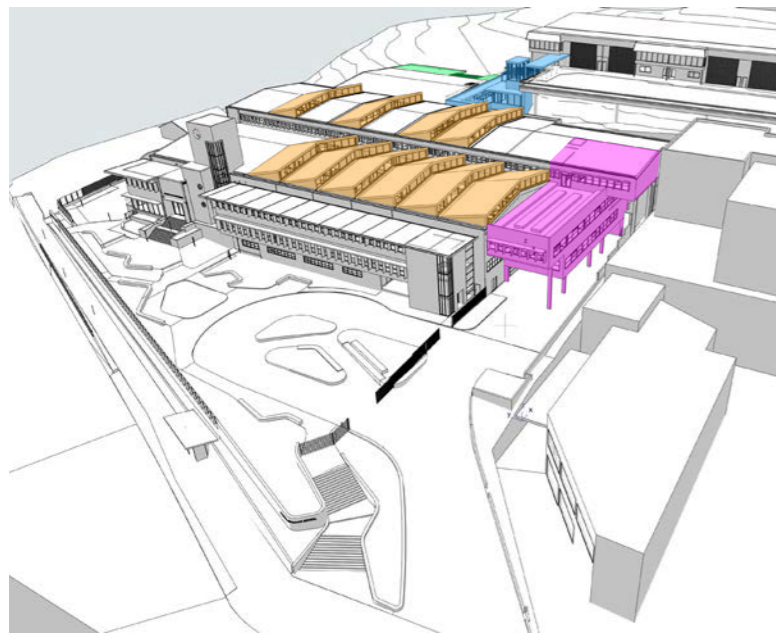
The south-facing skylights will substantially increase the user amenity by providing a natural ventilated airy and light interior space while maintaining adequate shading.

The proposed industrial-style saw-tooth form also references the history of the building, when it was used as a clothing factory. On an aerial image from 1952 it appears that the original building once had an array of skylights on the roof.

The proposed roof form and height was discussed with the Heritage Consultant and the GANSW Office. Both are in support of the proposal.



- Southern Extension
- Skylights
- Link Building
- Eastern Extension



5.3 Building Massing

The proposal includes 4 external extension volumes with minimal impact to the Urban Design of it's Industrial neighbourhood.

the extensions can be defined as follows.

Southern Extension

A 2-storey extension to the southern side of the existing building provides additional floor space for learning areas with a roof terrace above and car parking below.

The extension matches height and scale of the adjoining buildings to both sides and has no negative impact to the setting.

Skylights

A row of saw-tooth skylights pop-out structures provides natural light to the central areas of the building.

The extension is only marginally visible from the street due to the set-back from the western facade and has no negative impact to the setting.

Link Building

The extension to the north of 224 Headland Road provides a vital vertical link to the campus and also includes additional floor space for learning areas and the Wellness Precinct.

It is set into the escarpment and has minimal visual impact from any vantage point.

Eastern Extension

The eastern extension sits above the 2-storey section of the iMED building and fills in the gap along the eastern facade by extending the existing upper roof line across the existing building footprint.

This addition is a logical extension of the building envelope and has no negative impact on the character of the building or it's surroundings.

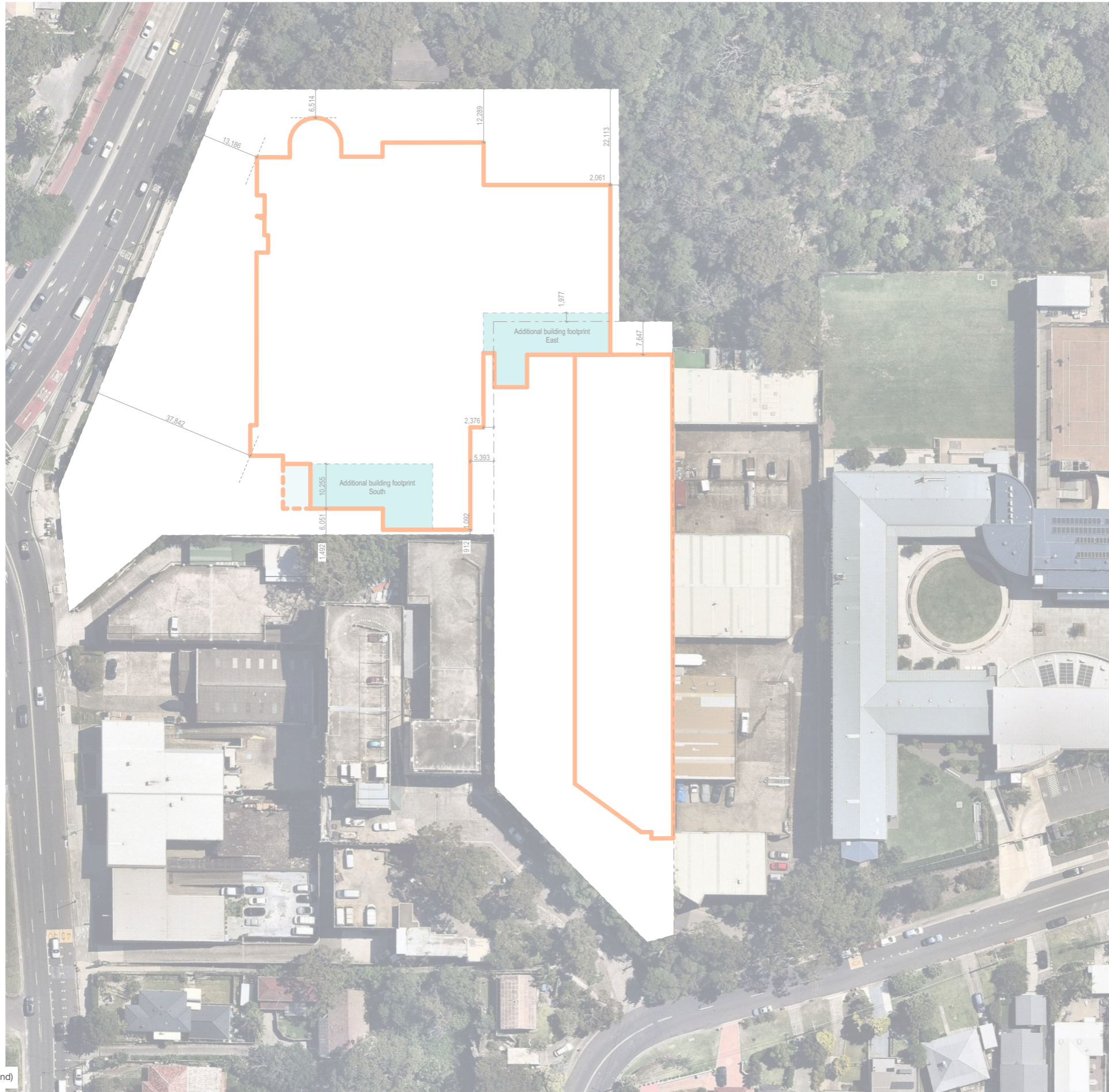


Image caption (drag to extend)

5.4 Site Set-Backs

The existing footprints of the buildings on 800 Pittwater Road and 224 Headland Road are retained in most parts and therefore the site set-backs are as mostly as existing.

To the east of the building on 800 Pittwater Road it is proposed to extend the building footprint to create a vertical link between 800 Pittwater Road and 224 Headland Road. The extension is proposed to extend across the site boundary. Site set-backs to adjoining properties remain unchanged at this location.

To the south of the building on 800 Pittwater Road it is proposed to extend the building footprint to create additional floor space for the school. The existing site set-back of ~1m is retained and proposed to be extended further along the southern boundary.

Along the western section of the southern boundary the existing site set-back of 16m is proposed to be reduced to ~6m site set-back to allow for the additional building footprint South.

Refer to the EIS for further detail.

5.5 Street View Analysis

Pittwater Road



Existing View



Proposed View

Warringah Road 1



Existing View



Proposed View

Warringah Road 2

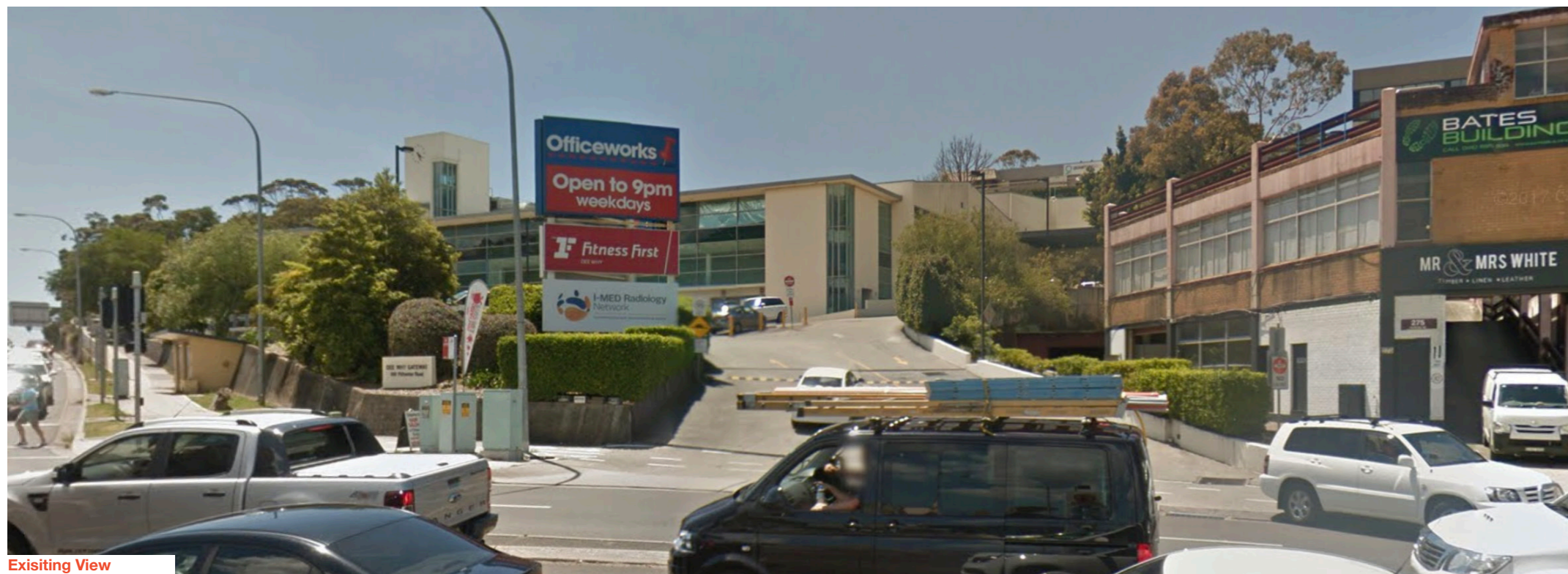


Existing View



Proposed View

Harbord Road



Existing View



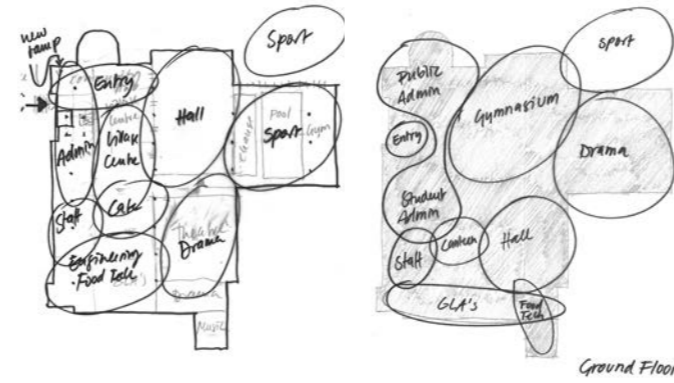
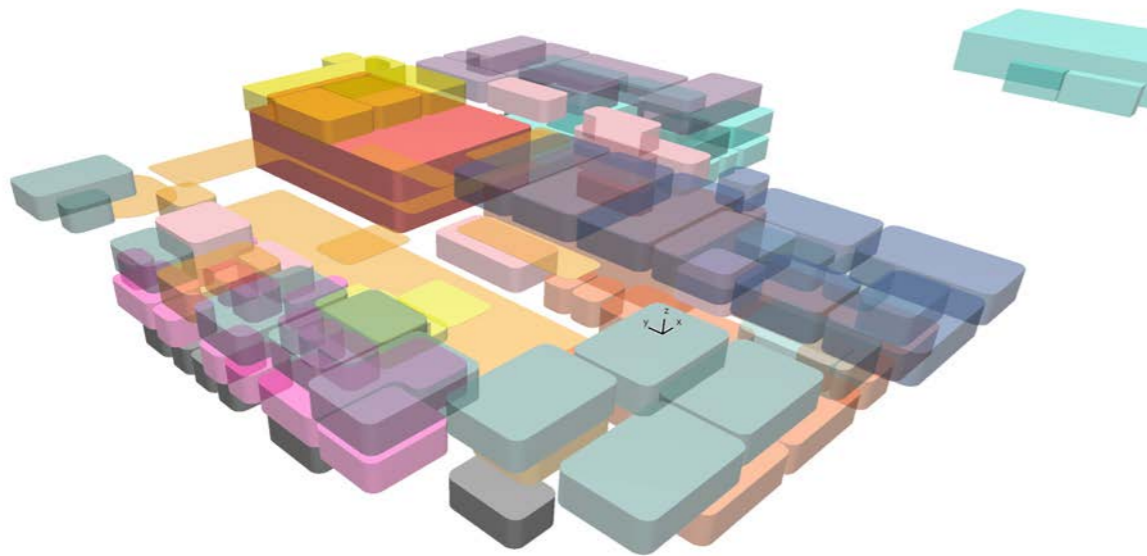
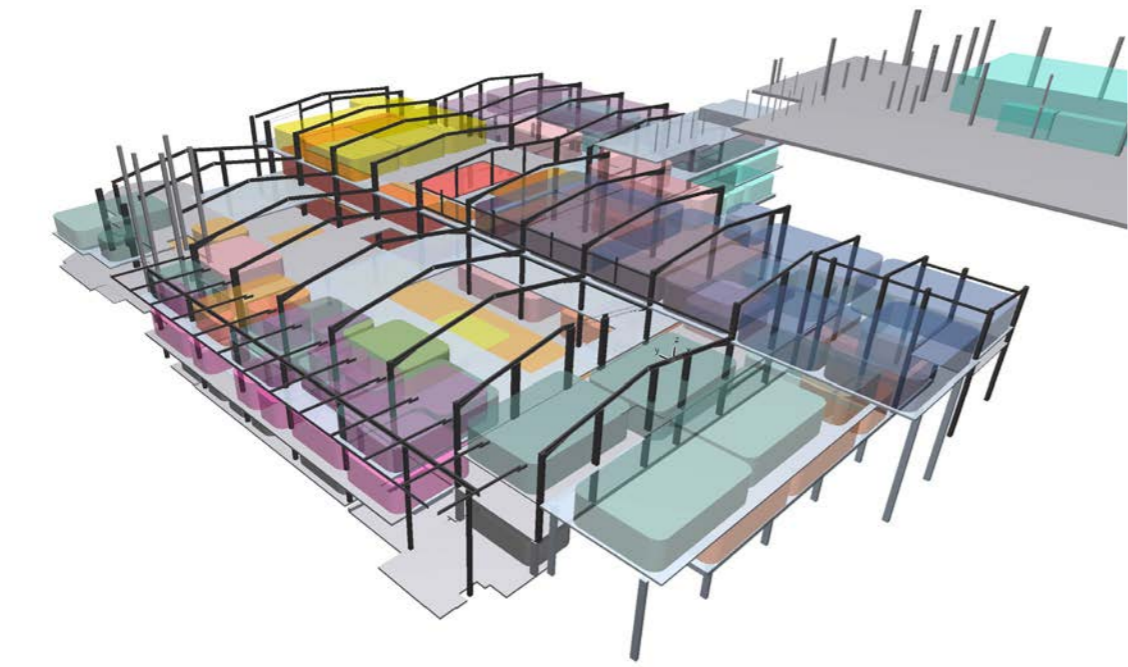
Proposed View



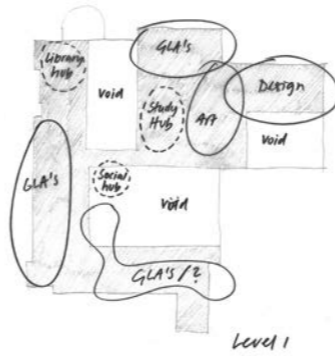
6.0

Design

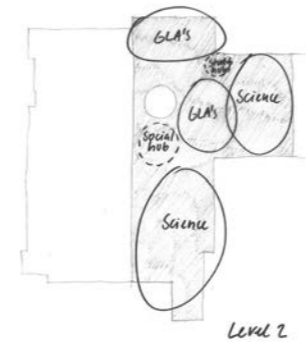
800 Pittwater Road



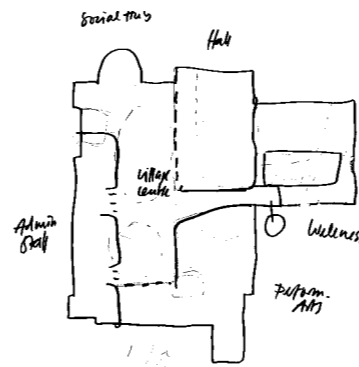
Level 2 Precincts and Voids



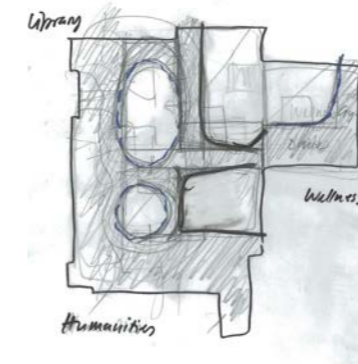
Level 1 Precincts and Voids



Level 2



Level 3 Precincts and Voids



6.1 Architectural Design Statement

The building has been designed to provide greatest flexibility for future learning models and a high connectivity between the distinct areas.

The GLA's have been clustered around flexible learning areas which are again connect to large circulation zones.

The over-scaled circulation zones with niches for non-time-tabled activities and social interaction are designed to prevent the need of corridors for psychological benefit.

A multitude of voids provide the visual connection between separate precincts and create a sense of unity and community through light filled and airy spaces.

The atrium is designed to act as a Village Centre, a generous space, closely connected to the surrounding precincts, where students, staff and visitors can meet, eat and connect.

The existing structural grid provides the framework and sets the scale for the new precincts, which will be slotted into the frame.

The building envelope will be to most parts replaced by a new high performance skin to meet ESD requirements and future technologies.

All heritage elements will be retained and all new facade elements are designed to complement the heritage fabric and restore the building to its former glory. The western facade is the main focal point and historic photos were the guide for the new facade layout.

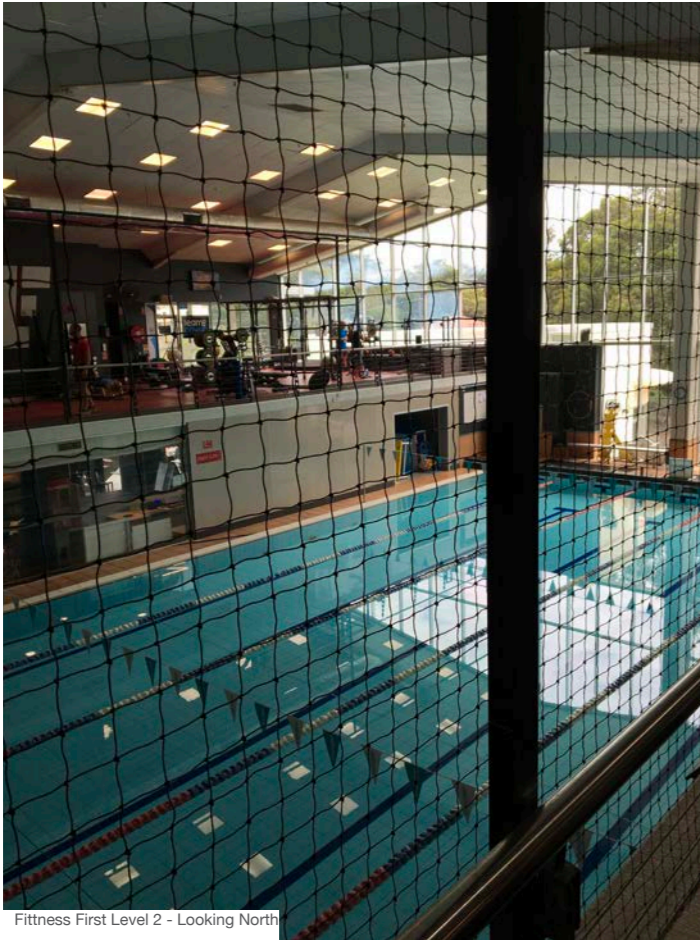
Each of the precincts and spaces has a distinct character and scale. The spaces are all connected through a multitude of voids and glazed walls to provide a sense of unity and community.



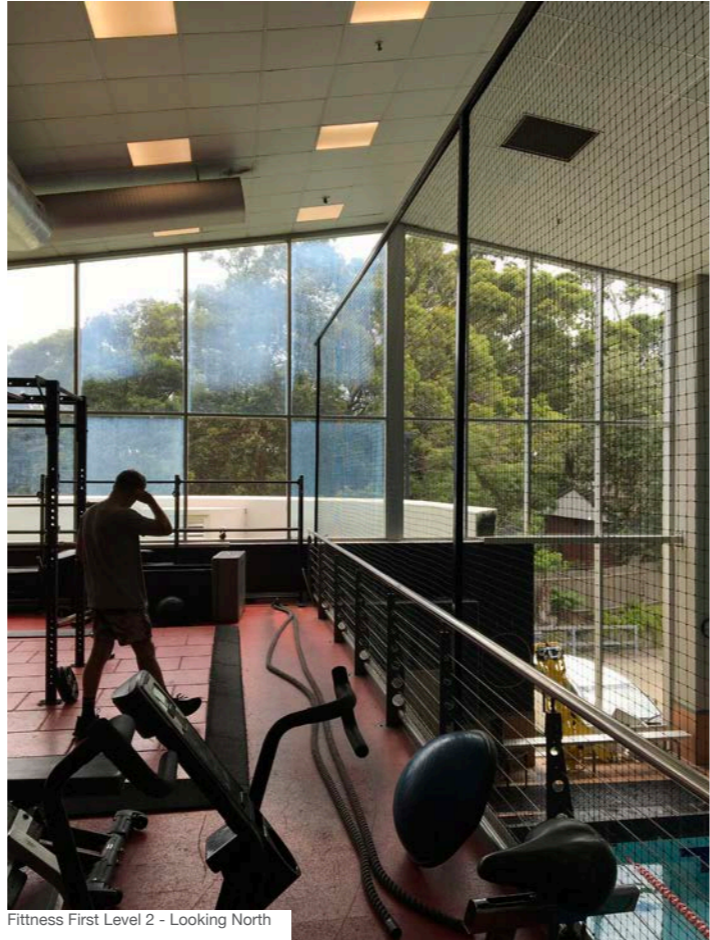
Office Works Level 1 - Looking North



IMED - Ceiling Void Level 2 - Looking North



Fitness First Level 2 - Looking North



Fitness First Level 2 - Looking North

6.2 Structural Design Statement

Existing Structure

- The existing building structure was constructed in stages in the early 1990's, with parts of the original heritage building incorporated into the new works.
- The current structure comprises reinforced concrete floors, a combination of reinforced concrete columns and concrete encased steel columns and a structural steel roof.

Proposed Structure

- The primary existing roof structure to be mostly retained and modified to suit in areas where the roof profile has been amended changed.
- New floors will be constructed "warehouse" volume of the existing Officeworks tenancy, and will comprise a conventional structure eg post-tensioned concrete, composite steel and concrete. New columns will be required to supplement the existing steel columns, that will require encasement for fire and strength.
- Alterations and additions are required to the existing floors in the Fitness First and I-Med buildings and will comprise a concrete slab system similar to the existing.
- Long span structures are required over the pool, auditorium and theatre and structure costs associated with these areas will be more.
- Acoustic requirements may need a "double structure" around the theatre and auditorium.
- Double columns will be required along the building joint between Stages 1 and 2 to allow the new floors to be constructed independently.
- Existing columns will need to be strengthened in some areas eg central columns in existing Officeworks, and columns supporting long-span structures over the pool/ auditorium.
- Anchored shoring will be required for the excavation into the area South of the new pool and stair.

Construction Constraints

- Retaining the existing roof and roof structure will limit material handling via crane across the site.
- Structures will generally need to be erected from within the existing buildings via smaller plant do to limited access via cranes.
- Care will need to be taken in demolition of floor structure around columns and other structure that is to be retained, smaller plant and equipment - lateral temporary propping of columns may be required to retain integrity.
- Propping of the heritage façade and retained elements may be required to allow removal and reinstatement of floors that they currently rely on for support.¹

1

Source : SDA Structures, Andrew Simpson



3xN - Ørestad College



3xN - Ørestad College



COBE + MVRDV_Roskilde Festival Folk High School



COBE + MVRDV_Roskilde Festival Folk High School

6.3 Precedent Images

A range of Australian and International precedents were studied to inform the design.

It is proposed for the adapted building for St Luke's Grammar School to respect and embrace it's industrial past, connect to the natural environment including Stony Range Botanic Garden and the Northern Beaches Region and represent the traditional face of the school.



Hassell - Ecosciences Precinct



Franklin Azzi Architects - Saint Nazaire Higher School of Fine Art + Architecture



Bates Smart: Design competition - Australia Technology Park

6.4 Design Quality Principles in accordance with the Education SEPP and GANSW Design Guide for Schools

Principle 1—context, built form and landscape

By substantially conserving the existing built form and all of the surviving heritage fabric, the proposal will preserve the high quality, award winning architecture.

The project has been the subject of a thorough Heritage Impact Assessment by City Plan Heritage.

Ongoing consultation with local elders will be undertaken to guide the provision of holistic interpretation and a significant indigenous artwork.

By limiting the footprint expansion away from the Stony Range reserve, its remnant, significant bushland will be conserved, whilst new glazing and open space will enjoy the prospect of this setting.

Extensive tree planting and landscaping, including to roof terraces, will meet the objectives of these Principles.

New fully accessible connections to the north will improve public transport use and connectivity to the local Dee Why town centre.

Principle 2—sustainable, efficient and durable

Detailed ESD planning has been undertaken by Wood & Grieve Engineers and has informed the daylighting, natural ventilation, mechanical systems and pool heating to reduce energy consumption whilst providing a high level of indoor environmental quality.

The School's Green Travel Plan developed by Varga Traffic Planning will reinforce the use of active transport and public transport by the senior level students and staff.

Principle 3—accessible and inclusive

The design is organised by clear, daylit east-west and north-south spines over the three levels, allowing excellent visual and physical connection across the campus. Each level of both spines connects to the external areas of the school and has good views over the surrounding landscape.

The new major lift and stair provides accessible connection to all levels of 800 Pittwater Rd and the main active level of 224 Headland rd.

A layered approach to the secure zones of the school provides good engagement with the community whilst ensuring child safety.

The café, pool and other facilities will be available for use by the community.

Age-specific play areas have been created for the Year 10-12 cohort of the School, together with the whole-of-school sporting facilities at 224 Headland Rd.

The site and all facilities are fully accessible.

Principle 4—health and safety

Careful site planning and traffic management lead to a safe and efficient use of the limited grounds, with timetables closure of zones for bus and car pickup and dropoff.

Clear sightlines and easily supervised internal and external areas facilitate safe active play and passive relaxation.

The internal school spine and the large open Auditorium will be available for wet weather activities at recess and lunchtime.

Undercover bike parking will join end-of-trip changerooms for use by staff and students as required.

The café, pool and other facilities will be available for use by the community.

Principle 5—amenity

The two buildings together provide a wide range of high-quality, well-lit, accessible teaching, collaborative and recreation spaces, many of which are designed to allow community and out-of-hours school use.

All have been specifically designed to meet the requirements of a future-focussed pedagogy for senior high school students.

The location of the major northern play areas and the operable glazed wall adjoin maximise connections to the open space to the north.

All teaching spaces are well daylit and able to be naturally ventilated.

The school spines are natural ventilated and will have automated stack-effect ventilation at roof level.

With acoustic engineering inputs, the glazing and boundary noise control screens provide a code-compliant noise control strategy, assisted by buffer planting to the western boundary.

Principle 6—whole of life, flexible and adaptive

The simple, flexible layout provides short-term flexibility through the use of standardised open and enclosed teaching areas able to be modified with extensive operable glazed walls.

In the longer term, the simple structural grid, flat floors and strategic location of 'fixed' elements such as the Theatre and Pool allow for maximum long term flexibility,

The design is part of a long-range master plan for the entire St Luke's campus, based on 20 year projections of enrolment and the potential availability of sites for connection and expansion.

The design has been assessed to include consideration of ecological and other impacts.

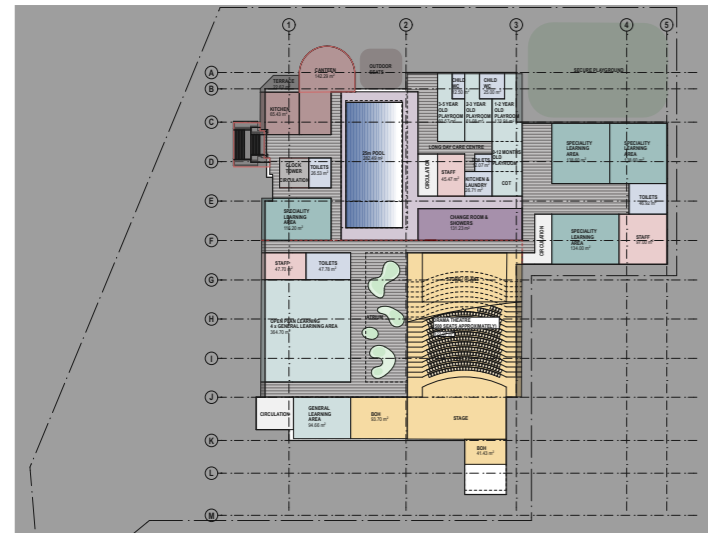
Principle 7— aesthetics

By building on the award-winning architectural character of the original 1950 structure, and retaining the most useful parts of the 1990s additions, the building achieves an appropriate, high quality architecture.

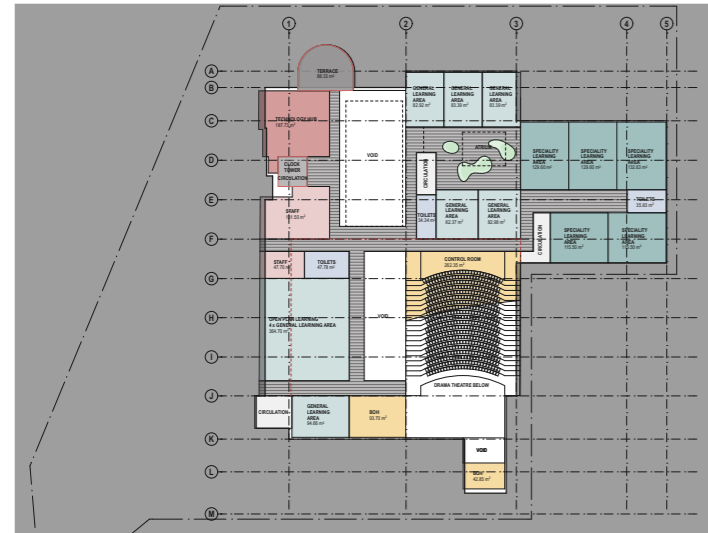
In particular, the presentation to the wider public domain to the west is enhanced through design and landscaping.

Public art will be included through consultation with the local Indigenous peoples, leading to the commissioning of an artwork reflecting the local Indigenous history and its ongoing importance.

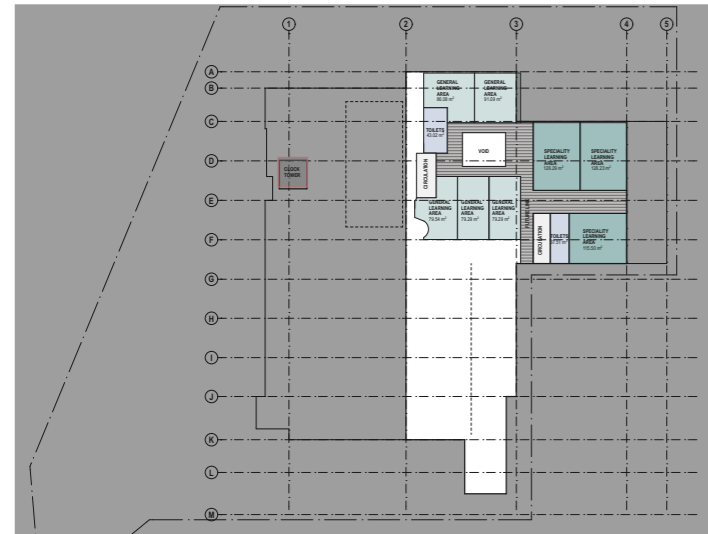
Masterplan



Level 1

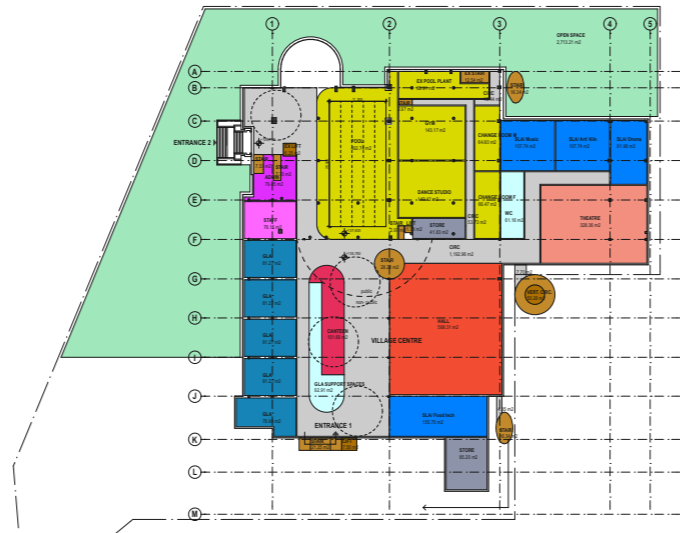


Level 2

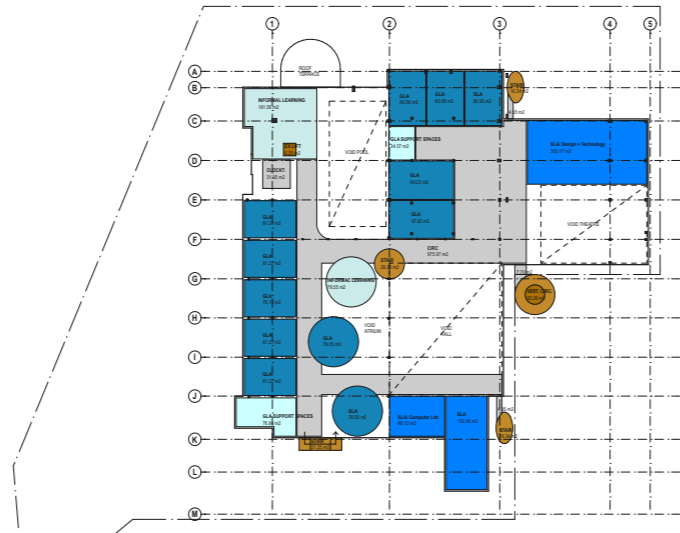


Level 3

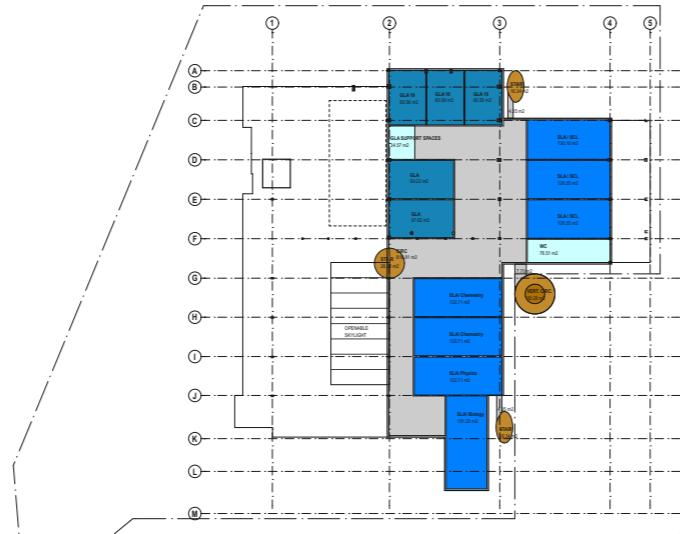
Option 1



Level 1



Level 2



Level 3

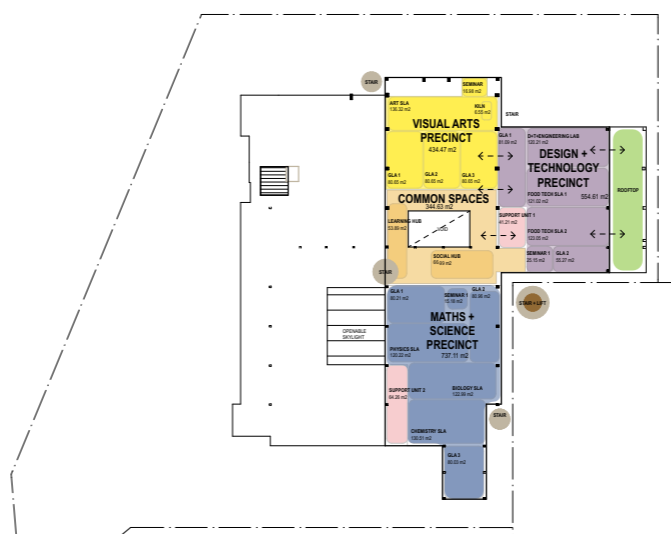
Option 2 - Preferred



Level 1



Level 2



Level 3

6.5 Options Analysis

A number of different Options were pursued at concept stage, investigating differing locations for the main school volumes, in particular the Pool and Theatre, as well as the layout and location of the smaller teaching spaces. It was initially intended to alter the existing pool to accommodate a full 25m length (the existing pool is only 20m) and provide an accessible ramp. The location of the pool however, adjoining the front entry and at a higher level than the main floor impeded access and movement, and as it required significant reconstruction, a location more suited to the overall school layout was selected.

Other Options have looked at the orientation and location of the Drama Theatre and the corresponding layout of the school spine and teaching spaces around it. Further, as the brief developed, the requirement for a modest addition to the south to accommodate the full range of briefed spaces was agreed.

Externally, differing options to reconstruct the 1990s façade to be more in keeping with the original character of the building were investigated leading to an optimal design of the sunshading to reduce afternoon sun and allow maximum views.

The design of the new roof lights, inspired by the original saw-tooth roof of the building underwent considerable development to maximise daylight and allow efficient stormwater drainage, whilst retaining the existing steel portal structure.



Original Bonds Top Dog Building circa 1950s



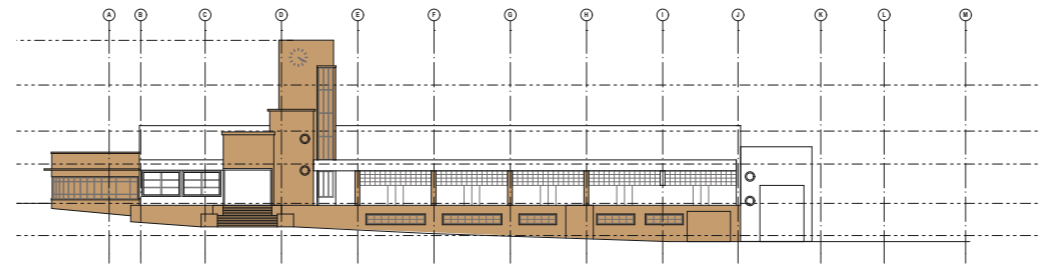
Proposed St Lukes Grammar School Senior



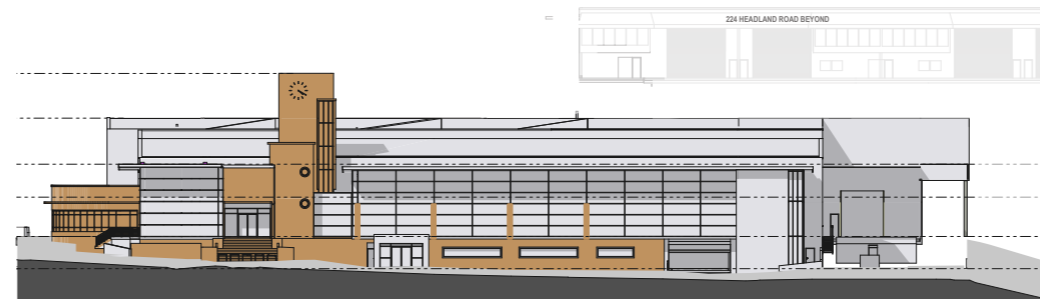
Revised Bonds Top Dog Building circa 1950s



Revised Dee Why Gateway Building 1993



Remaining Heritage Overlay - Original Facade



Remaining Heritage Overlay - Existing Facade



Remaining Heritage Overlay - Proposed Facade

6.6 Heritage Approach

All remaining heritage items will be retained.

All original building and landscape elements are to be restored and conserved.

The design of the new western facade is based on the original facade design by interpreting the solidity and the fenestration details of the original building.

Historic aerial photos of the original building show that the Bonds Top Dog fabric had a saw tooth roof to bring in light.

The proposed roof design uses the same strategy to bring daylight into the centre of the building and includes an array of south-facing skylights on the two main roofs.



Aerial Photo 1951
(Image source: <https://www.flickr.com/photos/angeljim46/11267157883/in/photolist-iaD8uP>)

Sports building - naturally ventilated

Retained building envelope + structure: minimised embodied energy + waste

Light coloured roofs to minimise heat island effects

Solar Panels (extent tbc)

Sunshading to northern glazing

Improved thermal performance through envelope upgrade

Shared spaces benefit from bushland views

Conserved heritage elements

6.7 ESD Approach

All heritage items will be retained and the aim is to retain as much of the existing building fabric as possible. For sustainability reasons the external skin will be upgraded to achieve the minimum project performance outcome of a 4-Star Green Star.

- Minimised impact on surrounding bushland.
- Daylight + views to occupied spaces.
- Low toxicity materials internally.
- Indigenous species for landscaping.
- Circulation + gathering zones naturally ventilated.
- Low energy plant for pool tbc.
- Removal of dark coloured paving and maximum green planting zones.

South facing skylights for daylighting

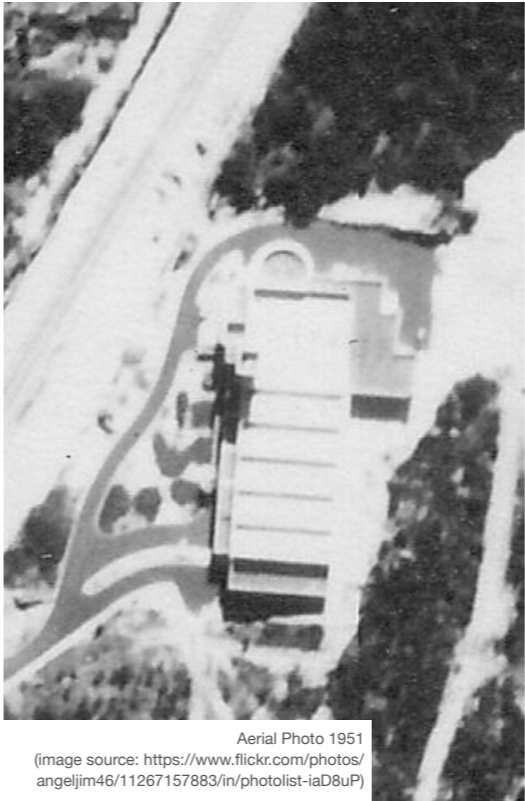
Retained building envelope + structure: minimised embodied energy + waste

Western glazing sunshades

Acoustic barrier to screen play space from road noise



Skylight Option 1



Aerial Photo 1951
(image source: <https://www.flickr.com/photos/angeljim46/11267157883/in/photolist-iaD8uP/>)

6.8 Roof Form Skylight

An extensive daylight access analysis has been conducted in consultation with the ESD and BCA consultants to investigate the lux levels of all learning spaces and common areas.

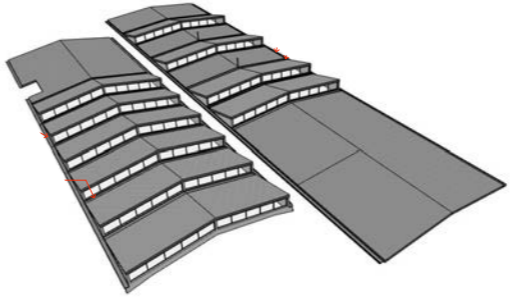
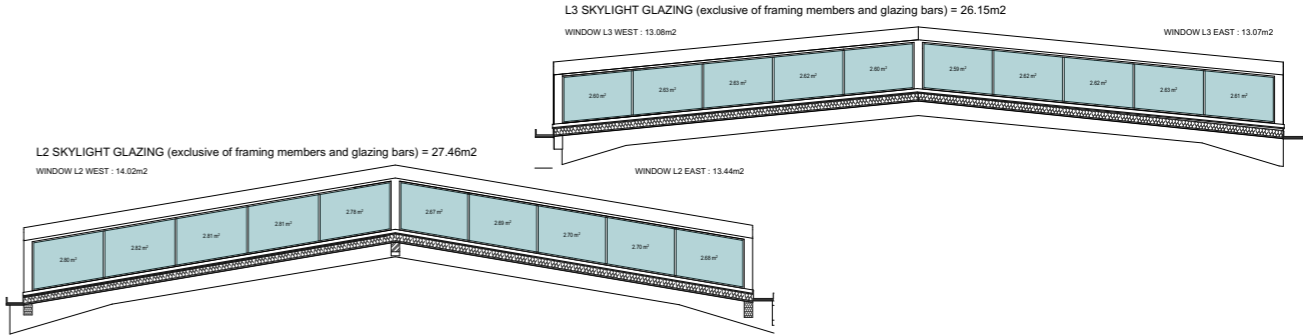
The existing building volume is setting the limit to the amount of window area which can be provided within the walls. To increase the amount of window area a number of skylight options was investigated to maximise natural light penetration into the central areas of the building.

The ESD consultant team used 3D daylight modelling software to prepare lux maps for all floor levels to show the affect of the two skylight options shown here.

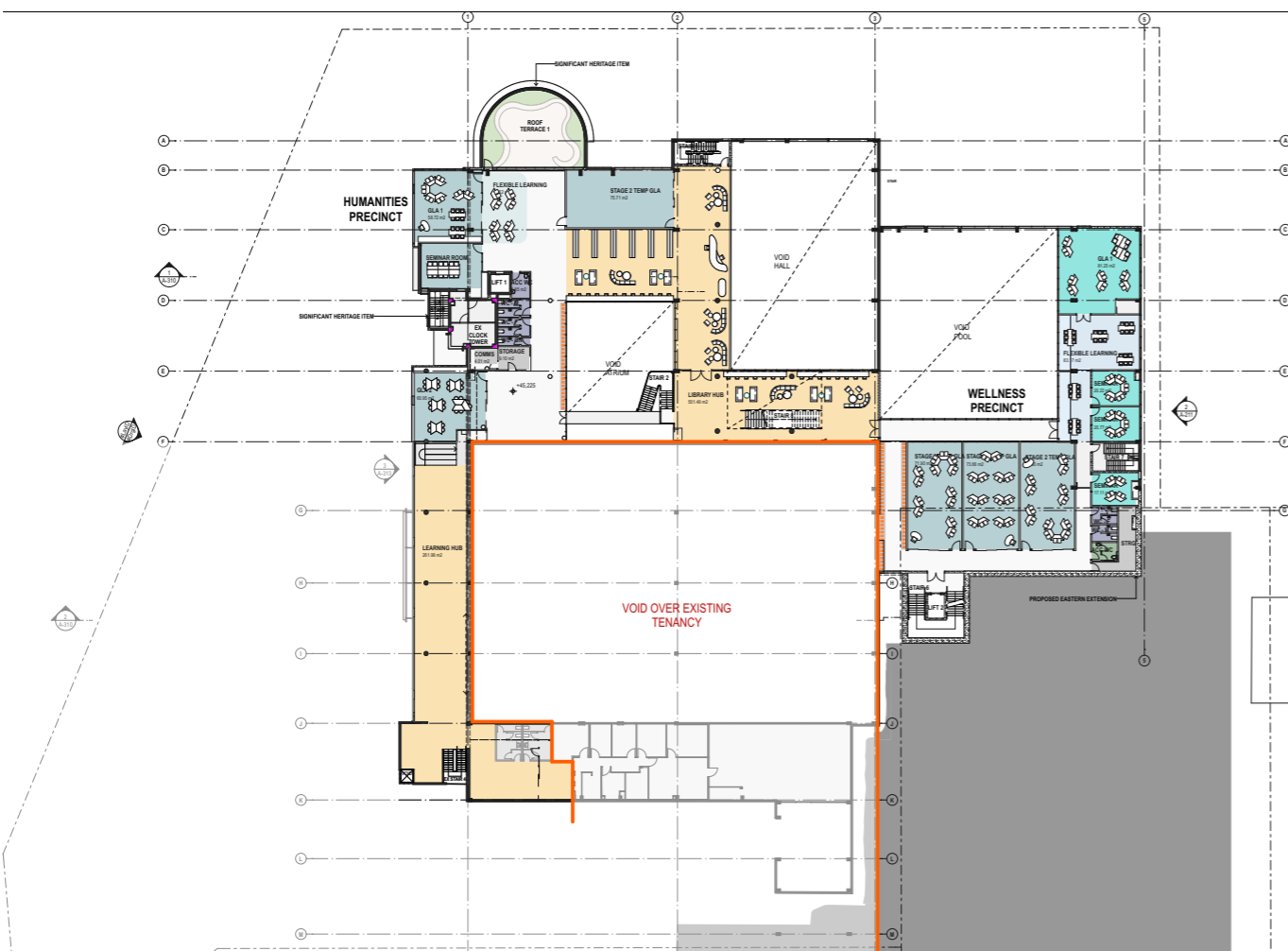
Refer to ESD Consultant Report for further detail.



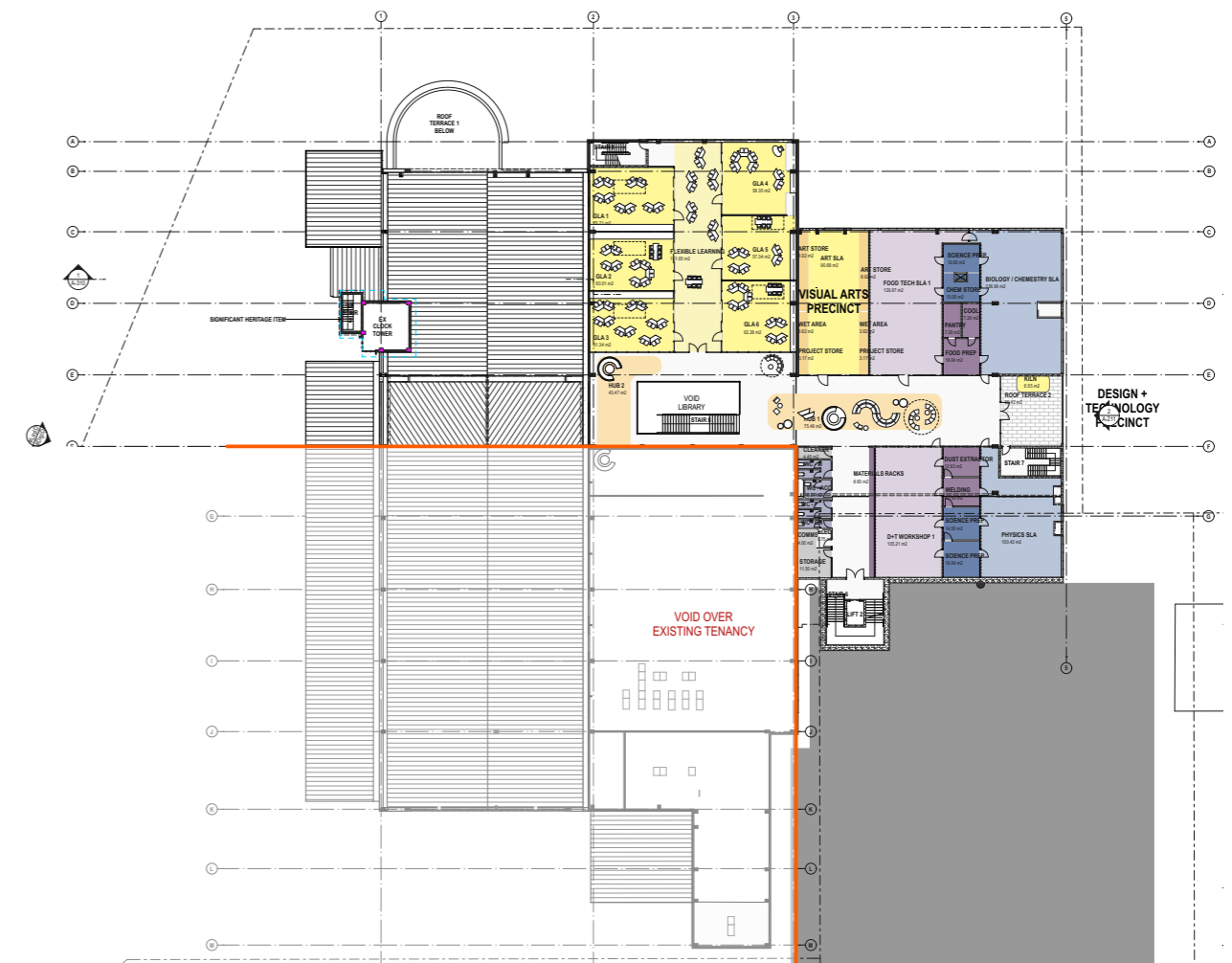
Skylight Option 2



Stage 2 - Level 2



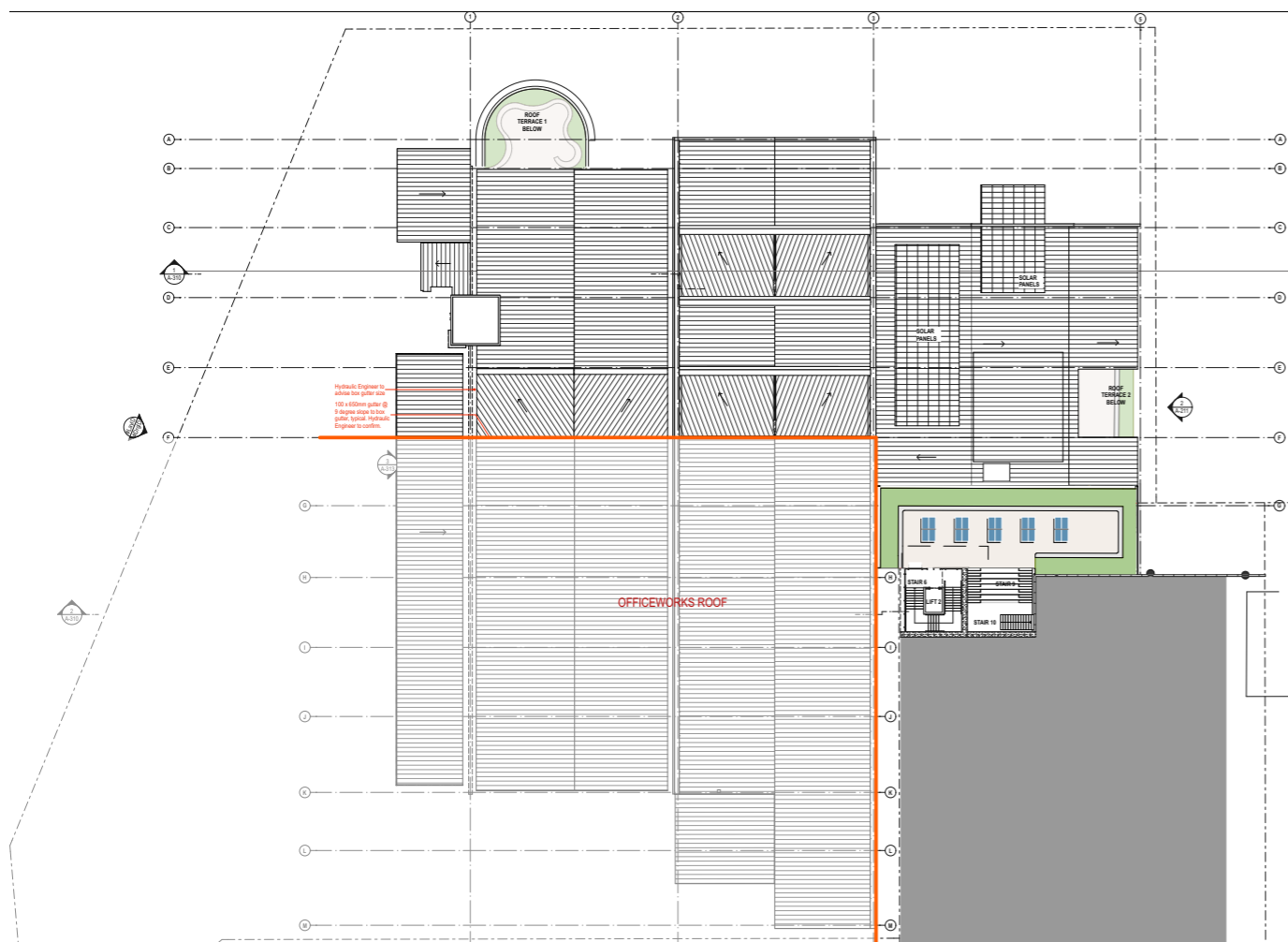
Stage 2 - Level 3



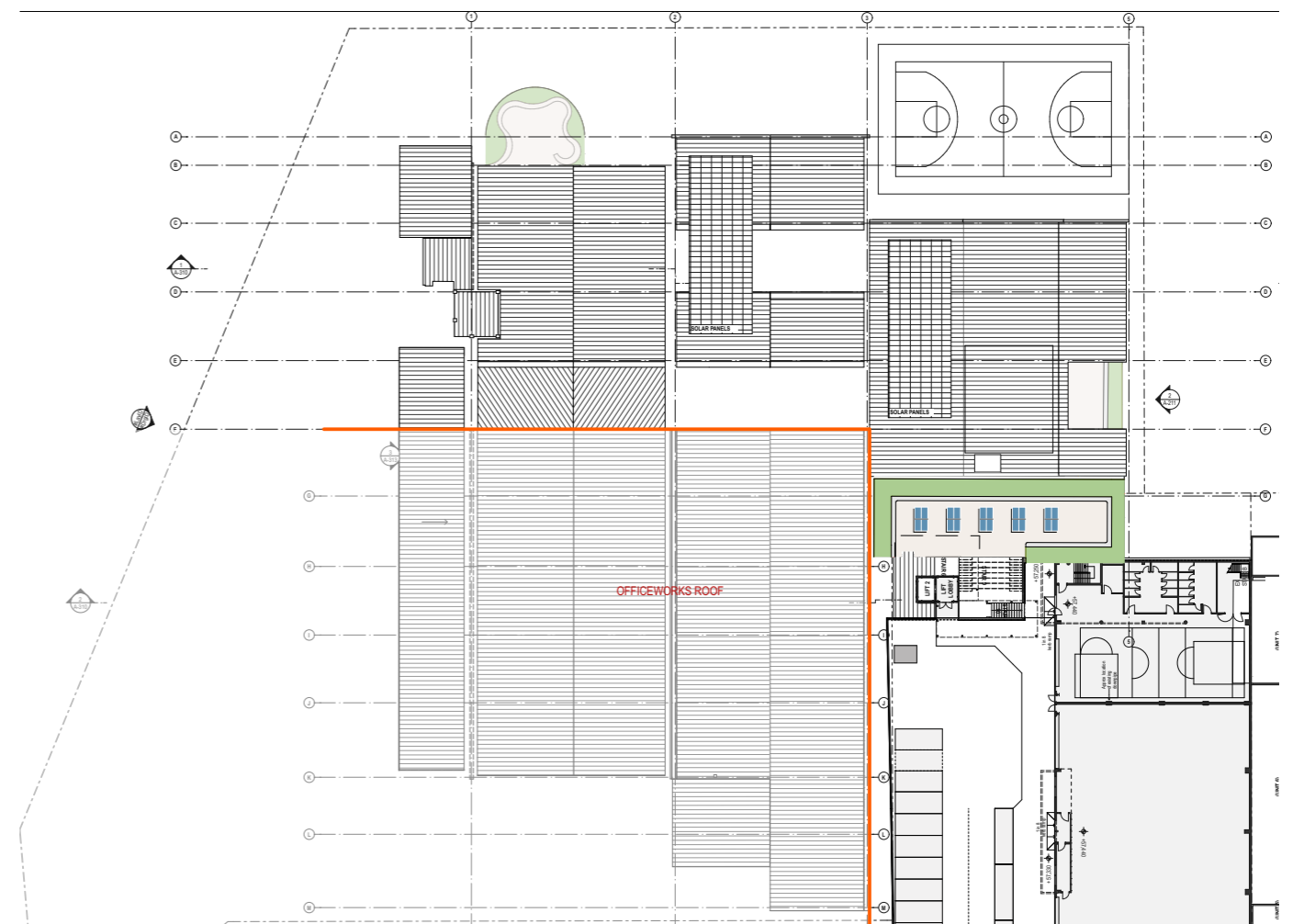
Key descriptor:

- ADMINISTRATION PRECINCT
- WELLNESS PRECINCT
- HUMANITIES PRECINCT
- LIBRARY PRECINCT
- DESIGN + TECHNOLOGY PRECINCT
- MATHS + SCIENCE PRECINCT
- ART PRECINCT
- PERFORMING ARTS PRECINCT
- AUDITORIUM

Stage 2 - Level 4



Stage 2 - Level 5

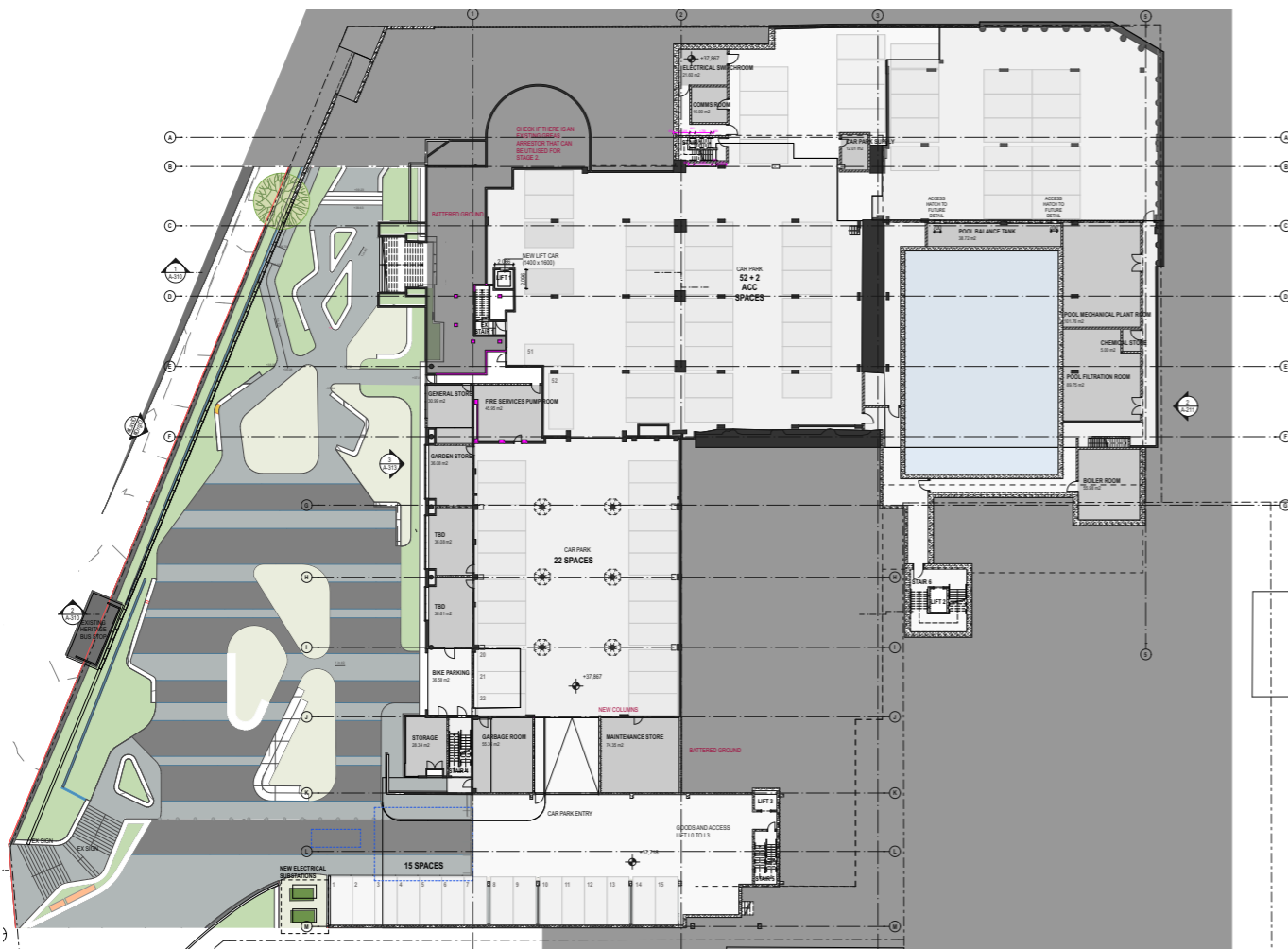


Key descriptor:

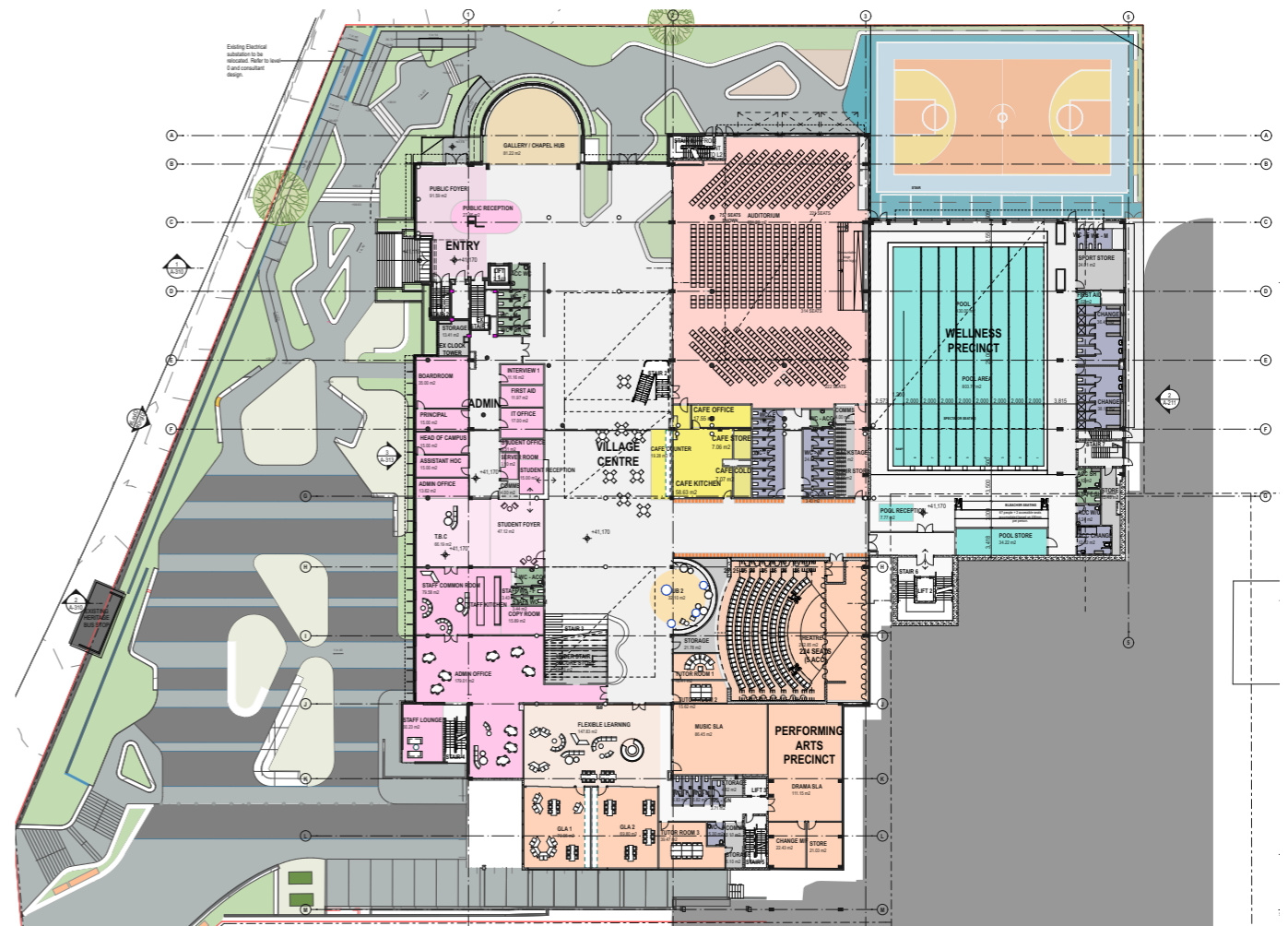
- ADMINISTRATION PRECINCT
- WELLNESS PRECINCT
- HUMANITIES PRECINCT
- LIBRARY PRECINCT
- DESIGN + TECHNOLOGY PRECINCT
- MATHS + SCIENCE PRECINCT
- ART PRECINCT
- PERFORMING ARTS PRECINCT
- AUDITORIUM

6.10 Space Planning Stage 3

Stage 3 - Level 0



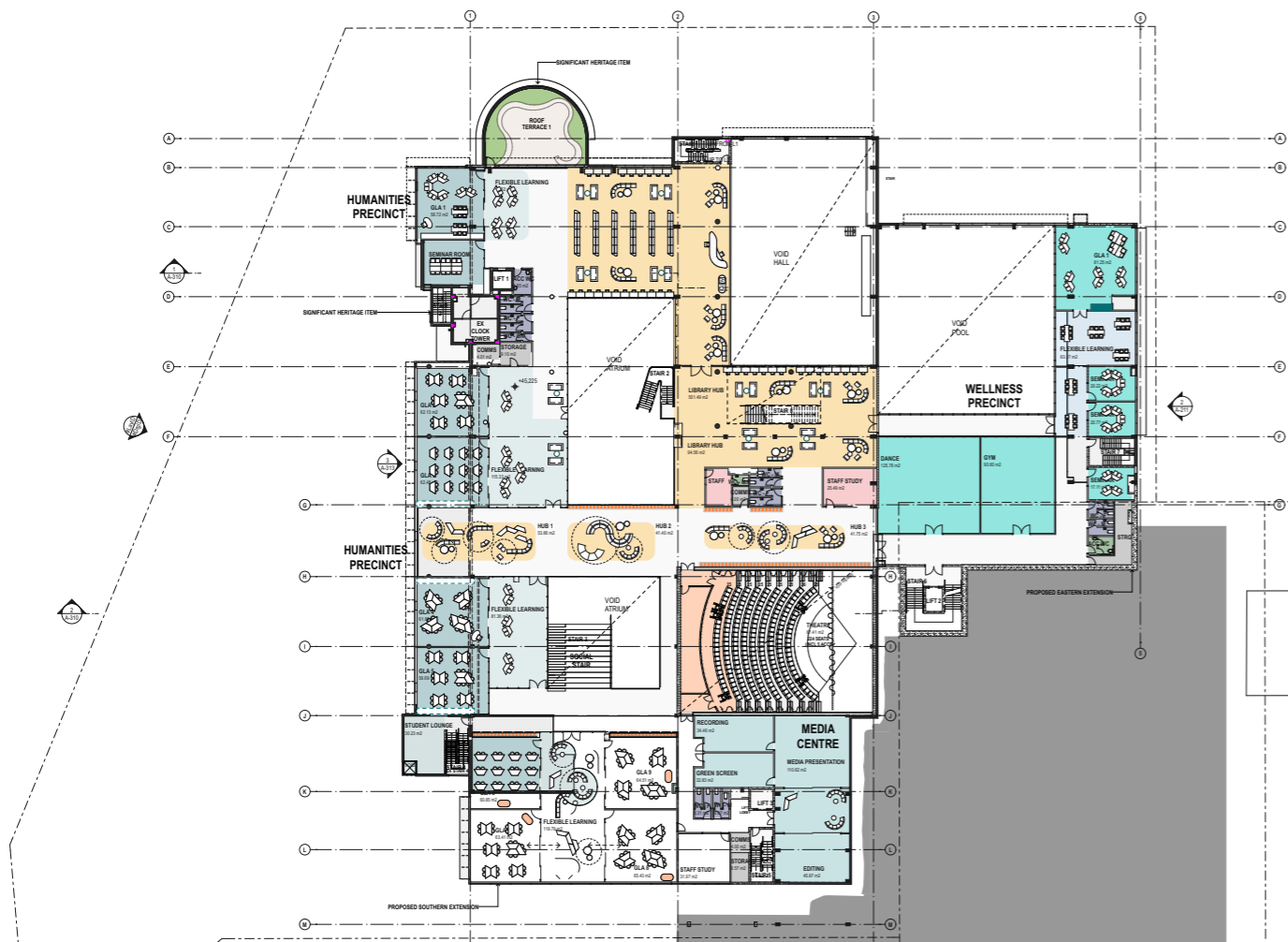
Stage 3 - Level 1



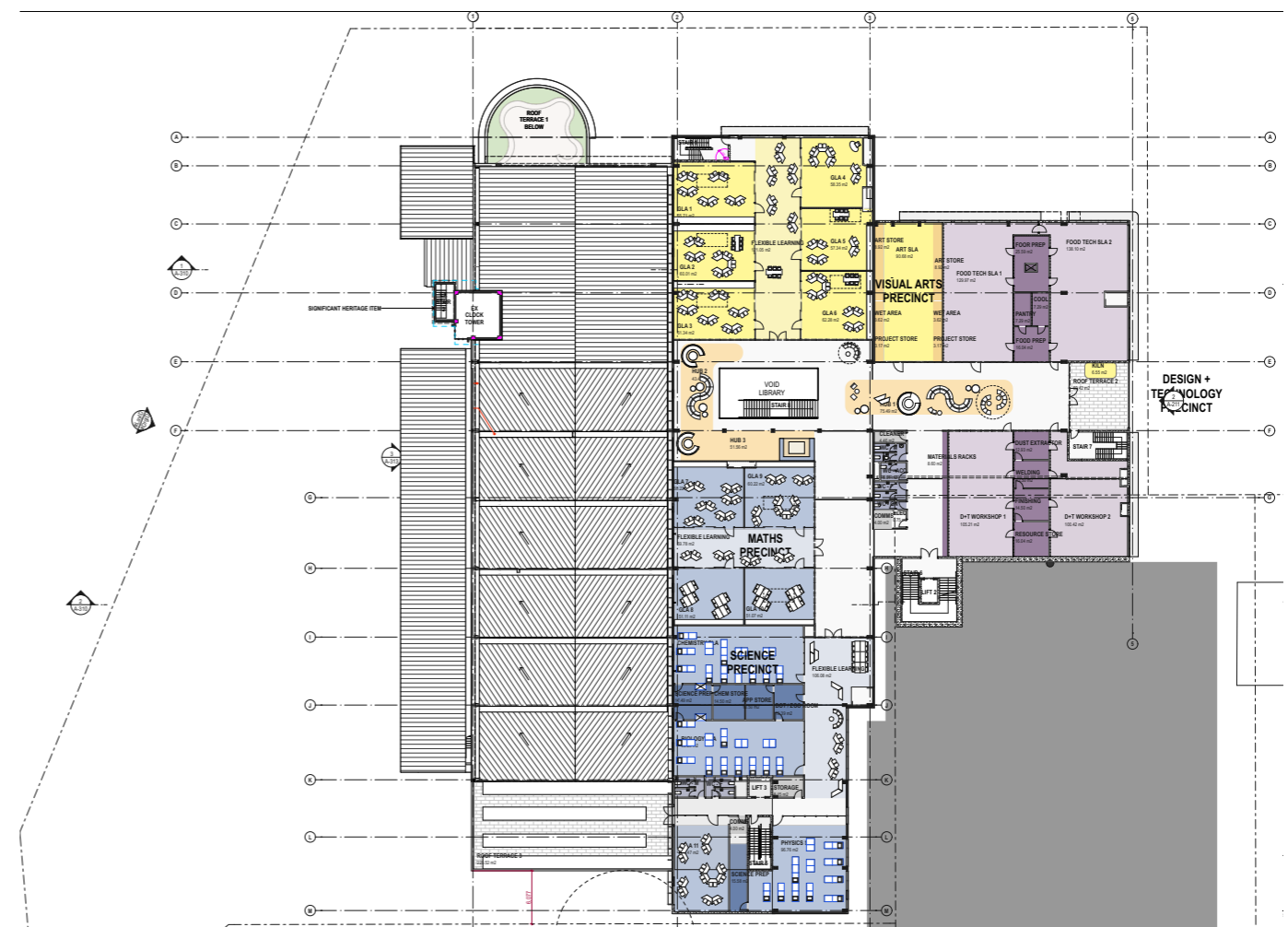
Key descriptor:

- ADMINISTRATION PRECINCT
- WELLNESS PRECINCT
- HUMANITIES PRECINCT
- LIBRARY PRECINCT
- DESIGN + TECHNOLOGY PRECINCT
- MATHS + SCIENCE PRECINCT
- ART PRECINCT
- PERFORMING ARTS PRECINCT
- AUDITORIUM

Stage 3 - Level 2



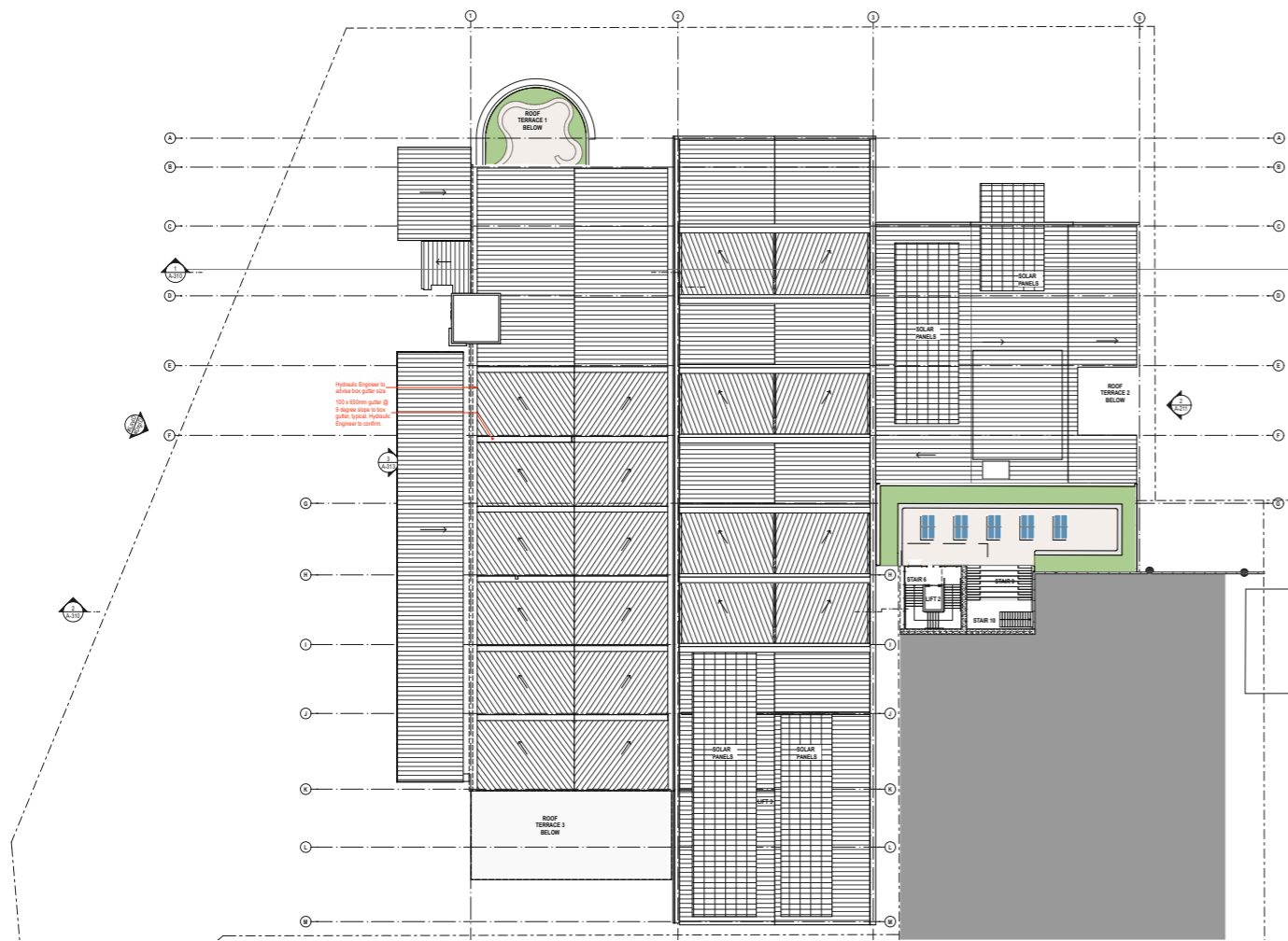
Stage 3 - Level 3



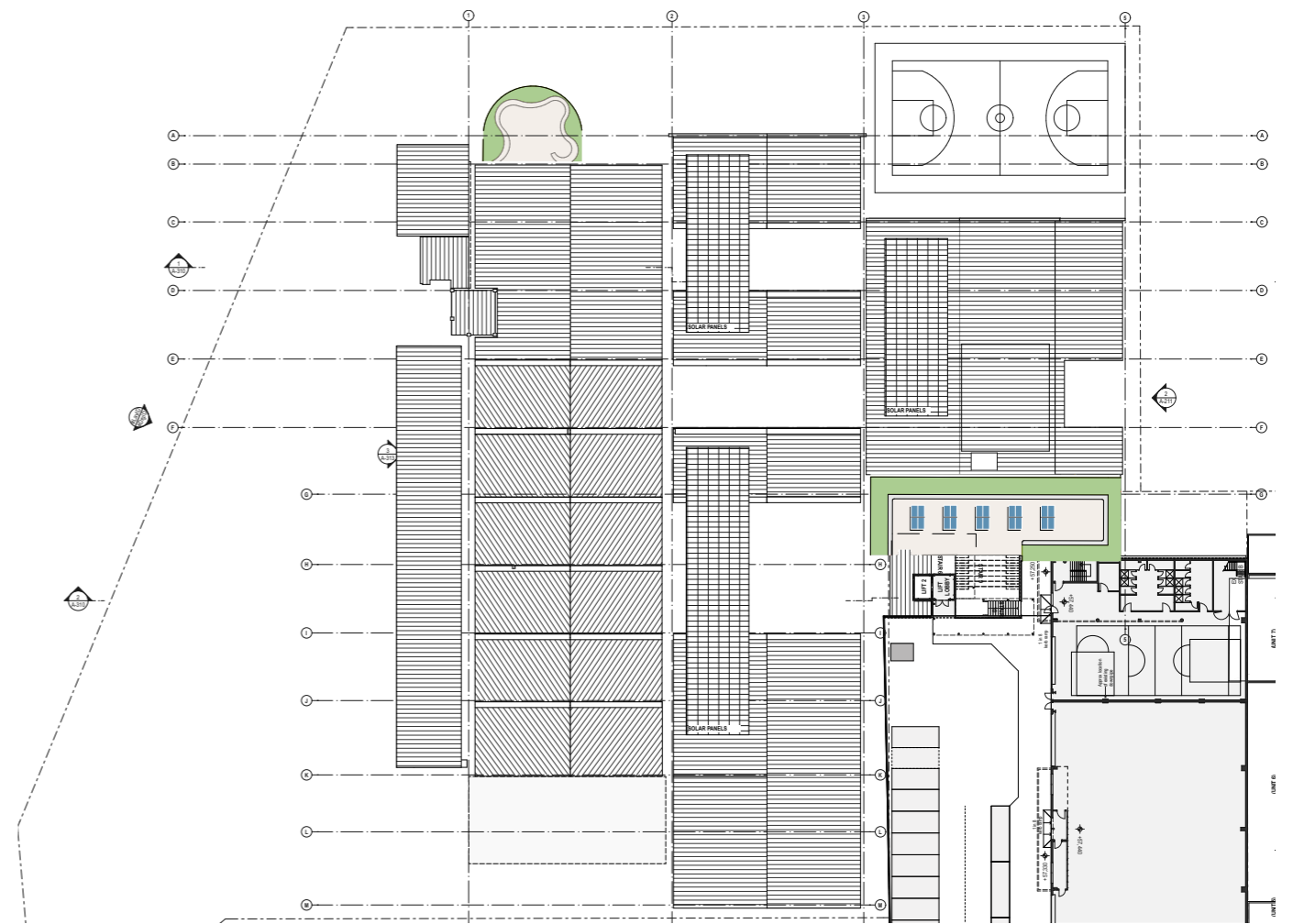
Key descriptor:

- ADMINISTRATION PRECINCT
- WELLNESS PRECINCT
- HUMANITIES PRECINCT
- LIBRARY PRECINCT
- DESIGN + TECHNOLOGY PRECINCT
- MATHS + SCIENCE PRECINCT
- ART PRECINCT
- PERFORMING ARTS PRECINCT
- AUDITORIUM

Stage 3 - Level 4



Stage 3 - Level 5



Key descriptor:

- ADMINISTRATION PRECINCT
- WELLNESS PRECINCT
- HUMANITIES PRECINCT
- LIBRARY PRECINCT
- DESIGN + TECHNOLOGY PRECINCT
- MATHS + SCIENCE PRECINCT
- ART PRECINCT
- PERFORMING ARTS PRECINCT
- AUDITORIUM

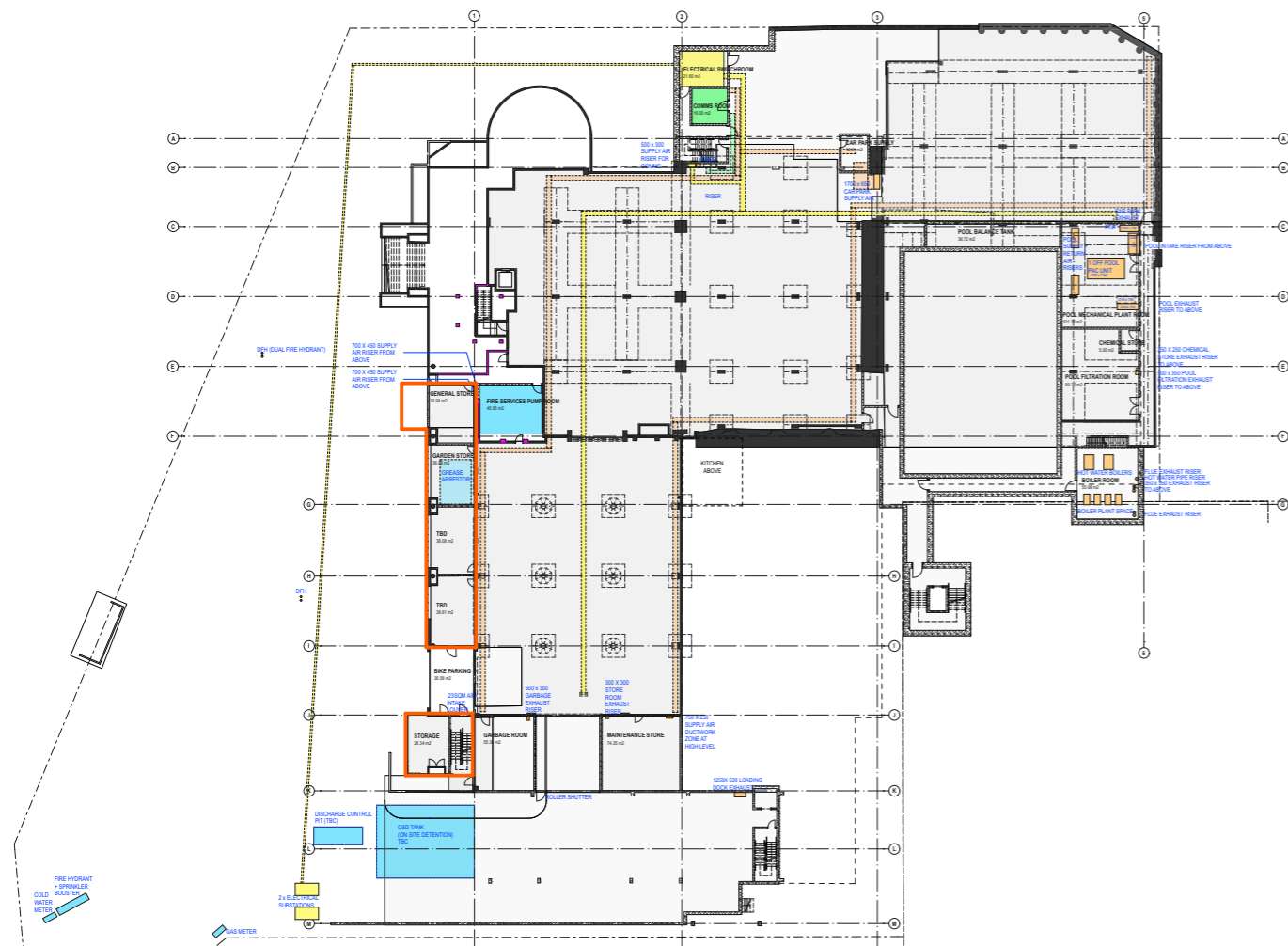
6.11 Building Services Integration

The proposed building services were developed in an extensive coordination period in consultation with the Electrical Engineer, Mechanical Engineer, Hydraulic and Fire Services Engineer, Aquatic Services Engineer, directed by the client brief and under review by the ESD Consultant, BCA Consultant and Fire Engineer.

All essential services will be provided in Stage 2.

The following coordination diagrams show the layout and vertical connection of the services throughout the building.

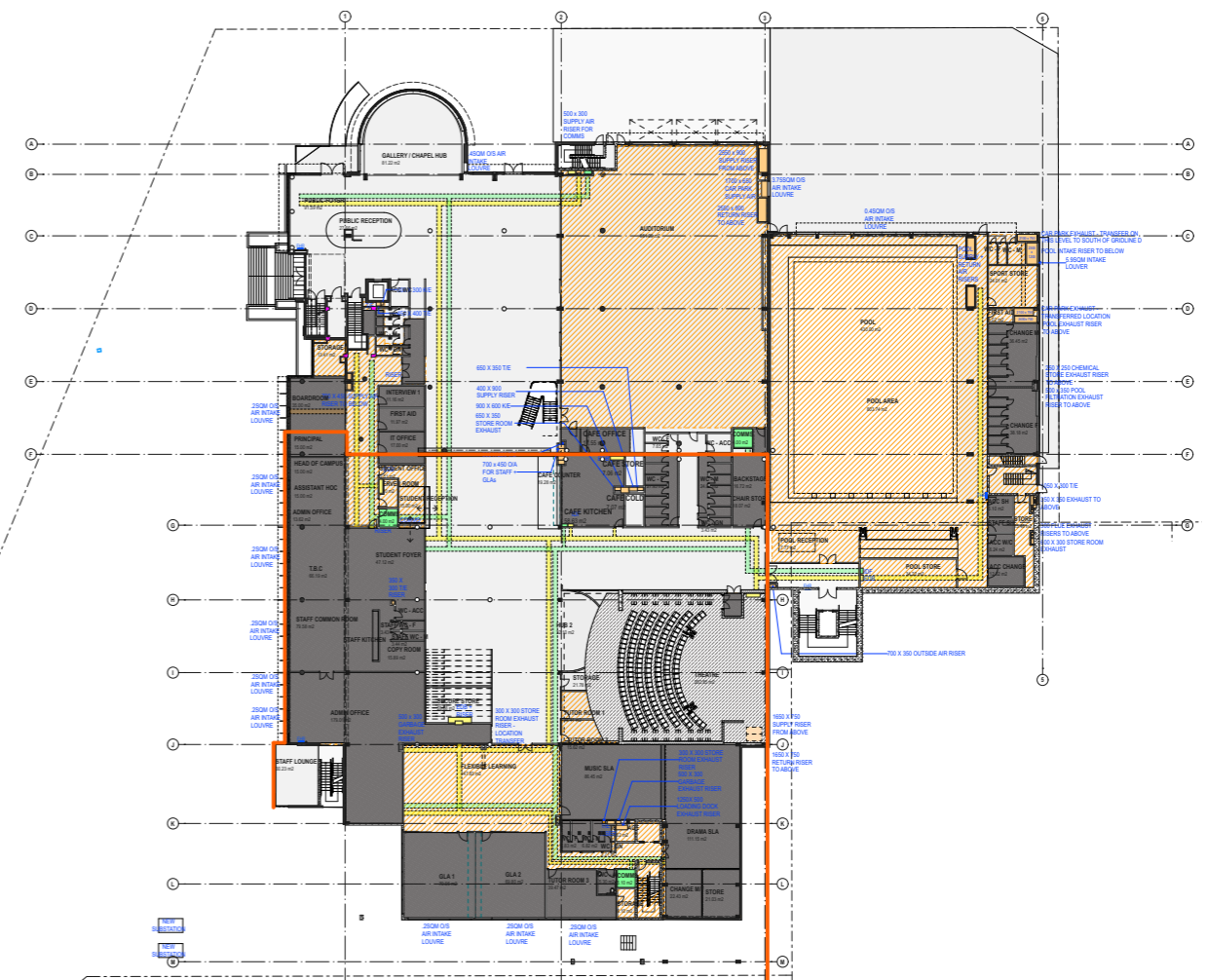
Level 0



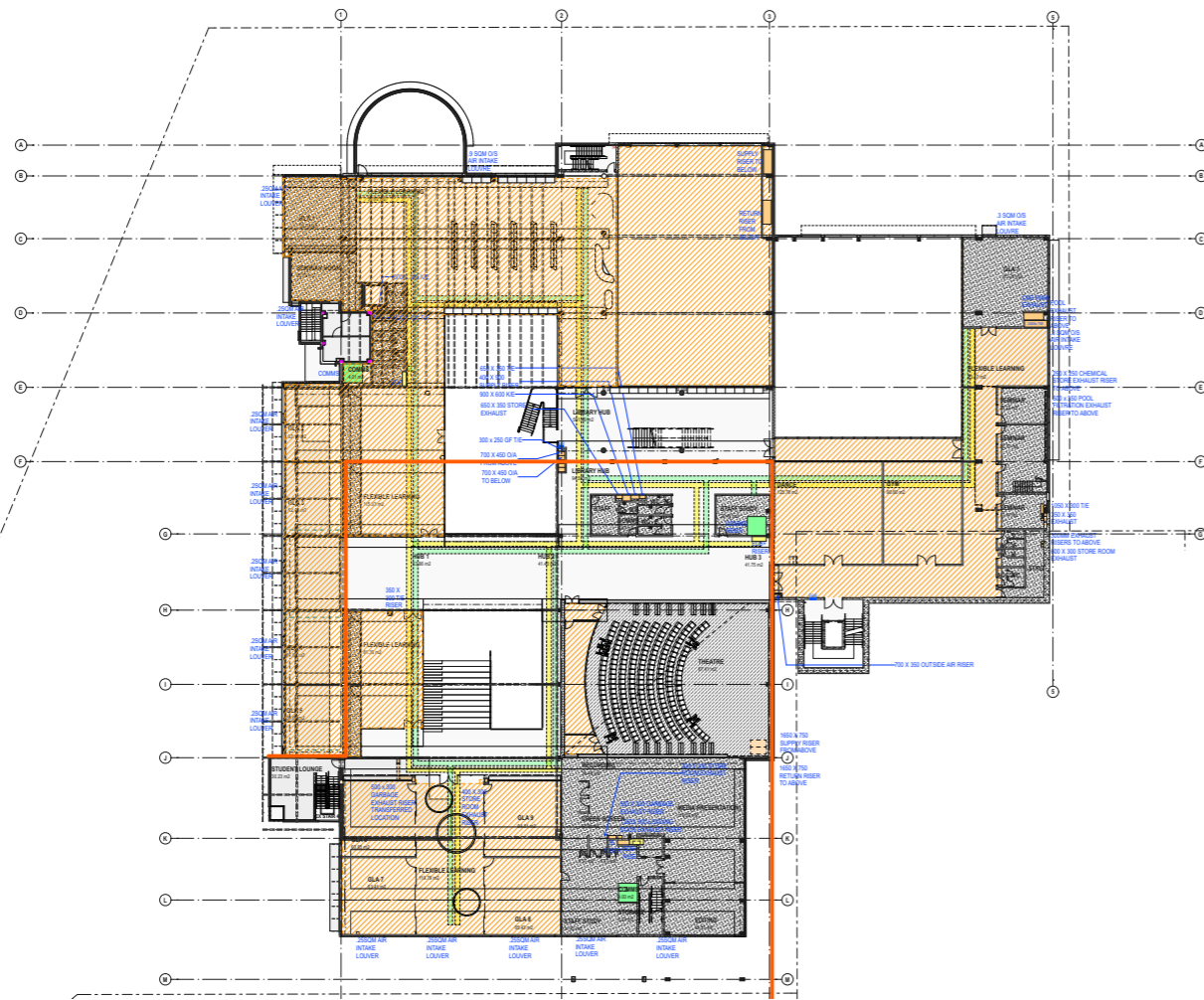
Key descriptor:

- BOUNDARY LINE BETWEEN STAGES 1 AND 2
- HYDRAULIC
- MECHANICAL
- ELECTRICAL
- COMMUNICATIONS
- ▨ AIR-CONDITIONED ZONES

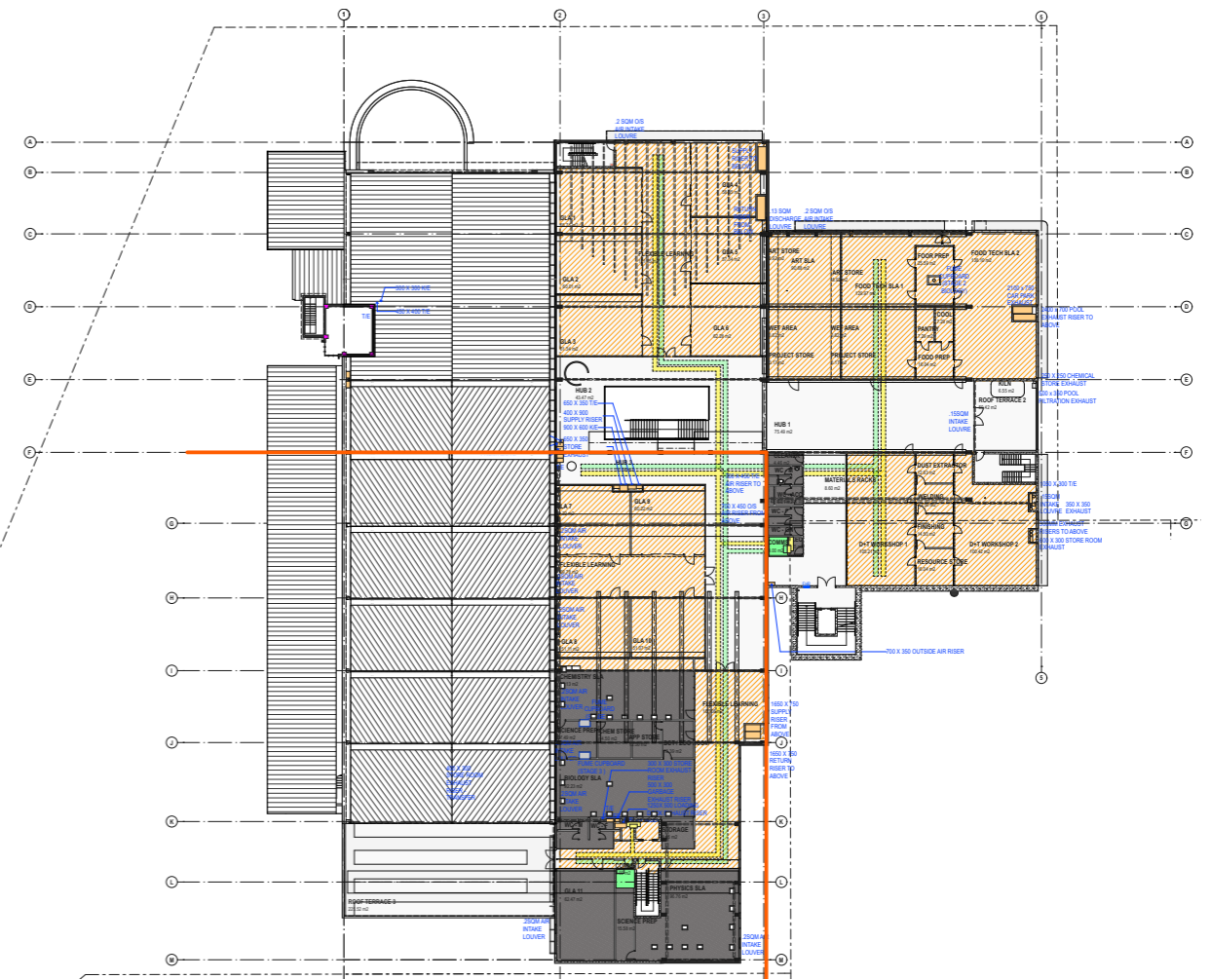
Level 1



Level 2



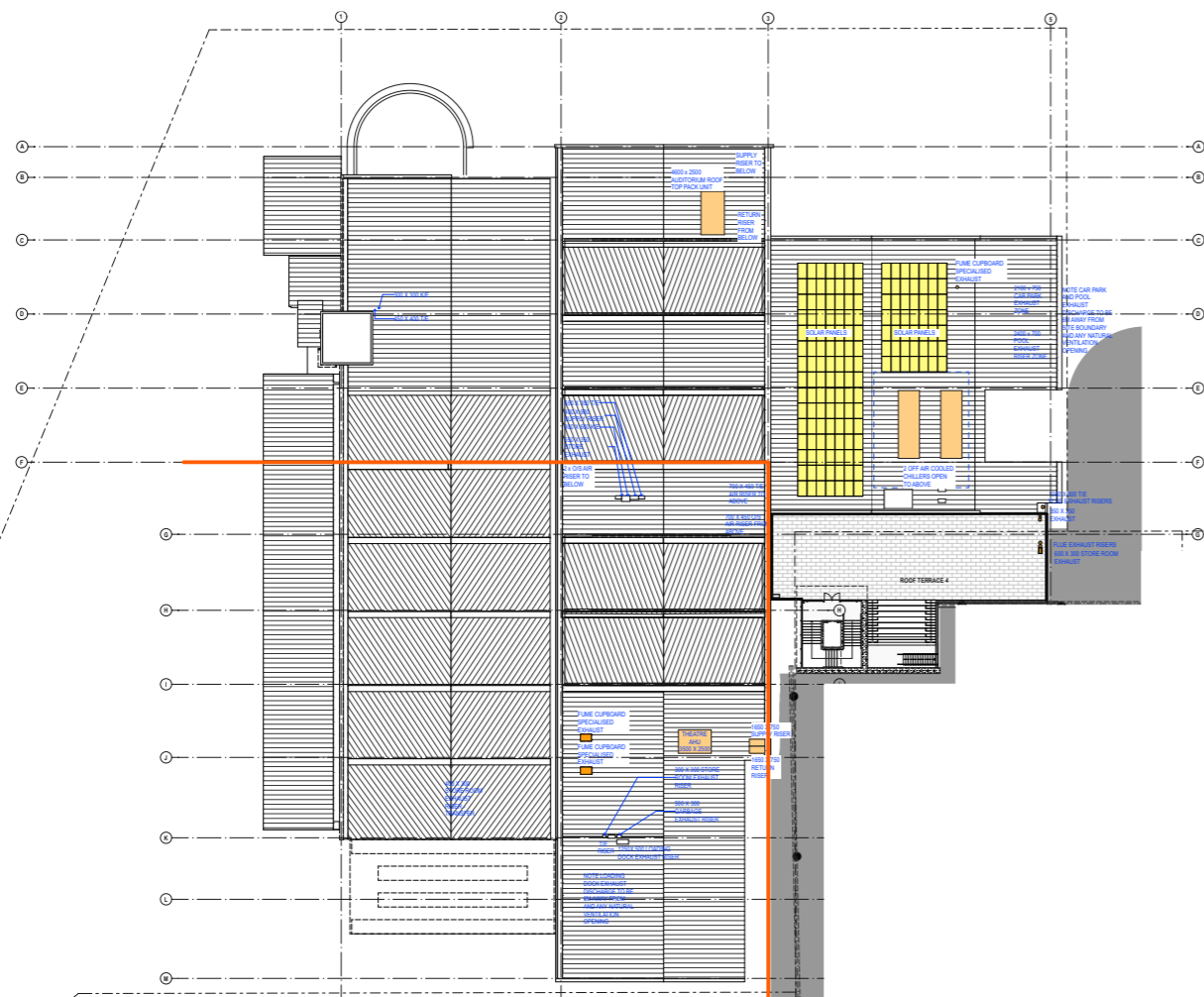
Level 3



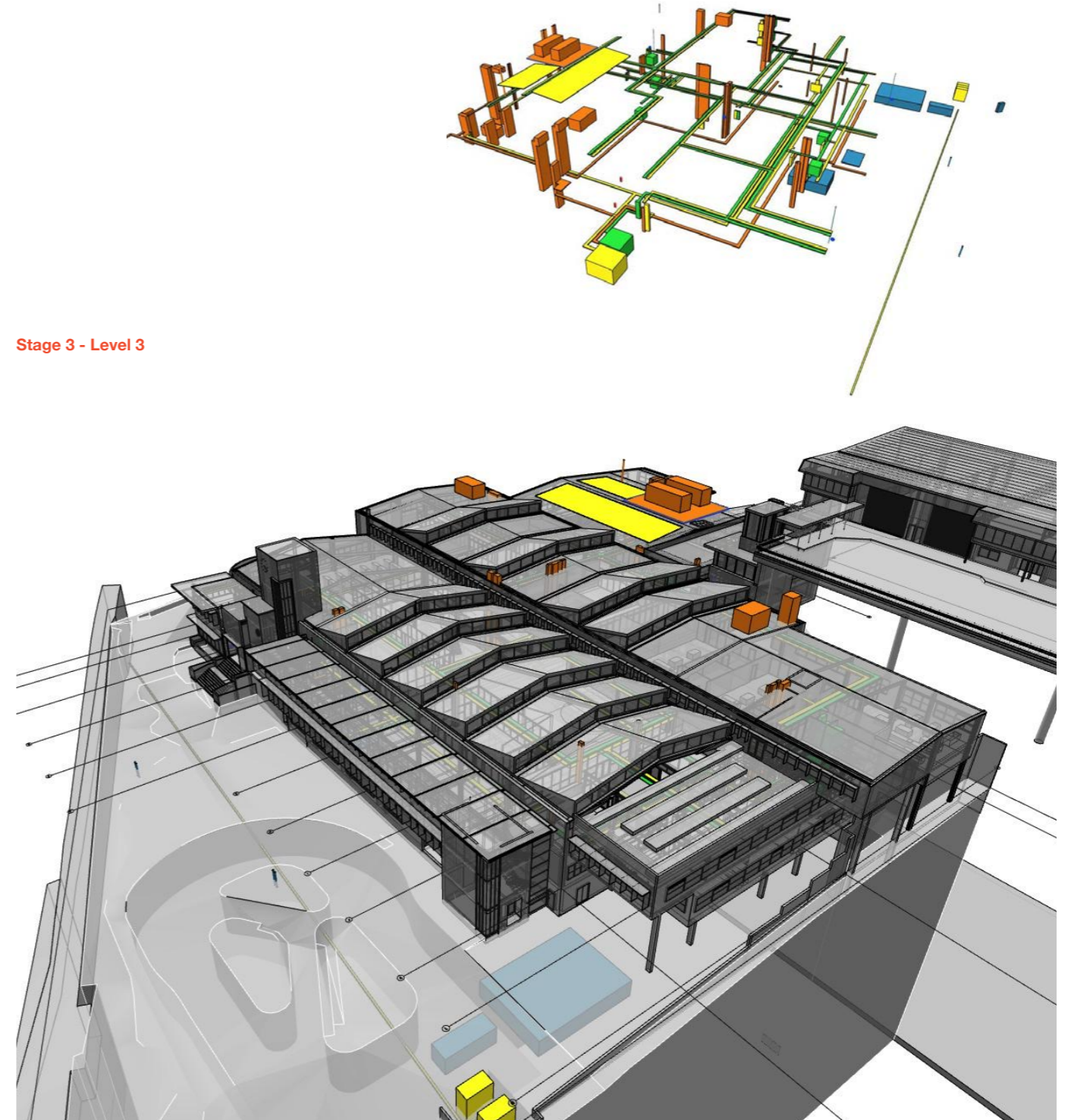
Key descriptor:

- BOUNDARY LINE BETWEEN STAGES 2 AND 3
- HYDRAULIC
- MECHANICAL
- ELECTRICAL
- COMMUNICATIONS
- ▨ AIR CONDITIONED ZONES

Level 4



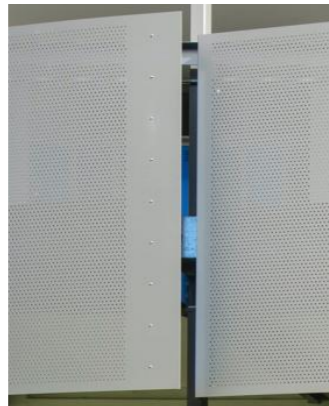
Stage 3 - Level 3



Exterior Wall Colours



Vitra Panel Facade shading



Colour Accents



Noise Barrier Wall



Polished Concrete Floor



Roof Sheeting



Concrete Paving



Timber Fence



6.12 Materials Strategy

Construction materials are proposed to be economical of nature with a focus on wide, open and expansive spaces and direct link with the outdoors. The industrial robustness of the structural framework will be offset with colourful inserts and a green atrium. This will bring warmth and playfulness into the school whilst the exterior will provide a face to the community.



Multiple colour options for the walls and shading fins have been investigated.

Option 1 - the blue colour scheme is based on the current St. Luke's Colour Masterplan. The Masterplan was developed by Tonkin Zulaikha Greer Architects in 2011 for the upgrade to the existing Campus on 210 Headland Road.

Options 2 - the toned down blue colour scheme (preferred scheme) still utilises the Masterplan colours, but with reduced saturation. The colours will give the Senior Campus a 'mature' identity and

still linking it back to the Campus on 210 Headland Road.

Option 3 is the neutral colour scheme. This scheme investigated the effect of all natural materials and light colours.

Option 2 is the proposed scheme. The proposed colours are white, mid grey and dark grey for the walls (Refer to 6.12 Material Strategy) and the darker colours are intended to reduce bulk by blending into the dark background of the surrounding bushland.

The heritage fabric of the existing building will be

6.13 Exterior Colour Strategy

rendered white to reflect the original finish. The new colours and materials have been chosen to complement the historic building facade.

The different colours will emphasise the individual building sections and provide an interpretation of the original building bulk.

The bright white will show the scale of the original building and in conjunction with the new western facade fenestration provides a contemporary interpretation of the original facade.



Recommended Sound Barrier Wall Location



6479-5.3R Appendix D

6.14 Noise Barrier Wall

Acoustic Assessment

A traffic noise intrusion study has been carried out by the Acoustic Consultant for the proposal at 800 Pittwater Road and 224 Headland Road.

The proposed development is affected by road traffic noise from Pittwater Road, which carries heavy traffic volumes.

The study found that noise controls are required to reduce the noise intrusion to within acceptable internal and external noise levels.

The following recommendation has informed the noise barrier wall as detailed on the following page:

6.1 Sound Barrier Wall

We recommend constructing a 1.8 metre high sound barrier wall along the entire length of the western boundary of the ground level outdoor play area, as shown in the attached Appendix D.

The sound barrier wall may be constructed from masonry, 10 mm thick solid polycarbonate sheeting, 3 rail 'solid capped and lapped' timber or 6.38 mm thick laminated glass. The construction shall be free of visible air gaps to provide an impervious sound barrier. Should an alternate construction method be proposed, it must be reviewed by an appropriately qualified Acoustic Consultant.

Once the sound barrier wall is incorporated into the design, the required road TNR is reduced in some locations due to the increased shielding of Pittwater Road provided by the sound barrier wall.¹

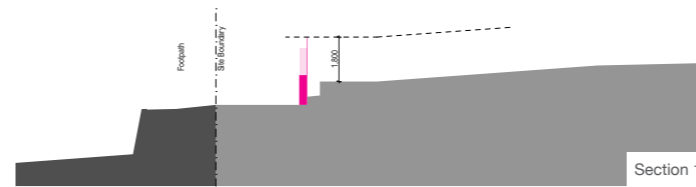
Refer to the Traffic Noise Intrusion Assessment for more detail.

¹ Source: 'Traffic Noise Intrusion Assessment' by Day Design Pty Ltd, page 19.

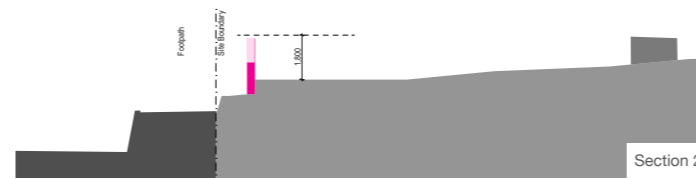




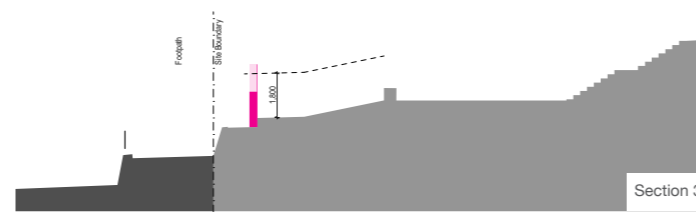
View from North



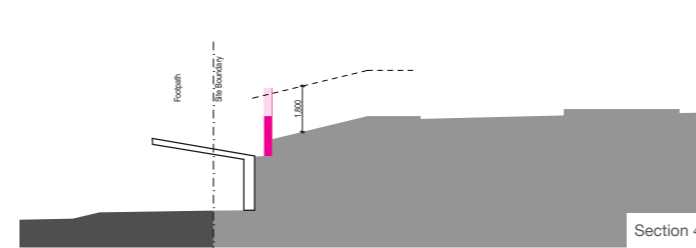
Section 1



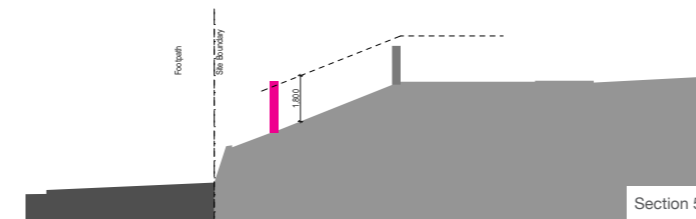
Section 2



Section 3



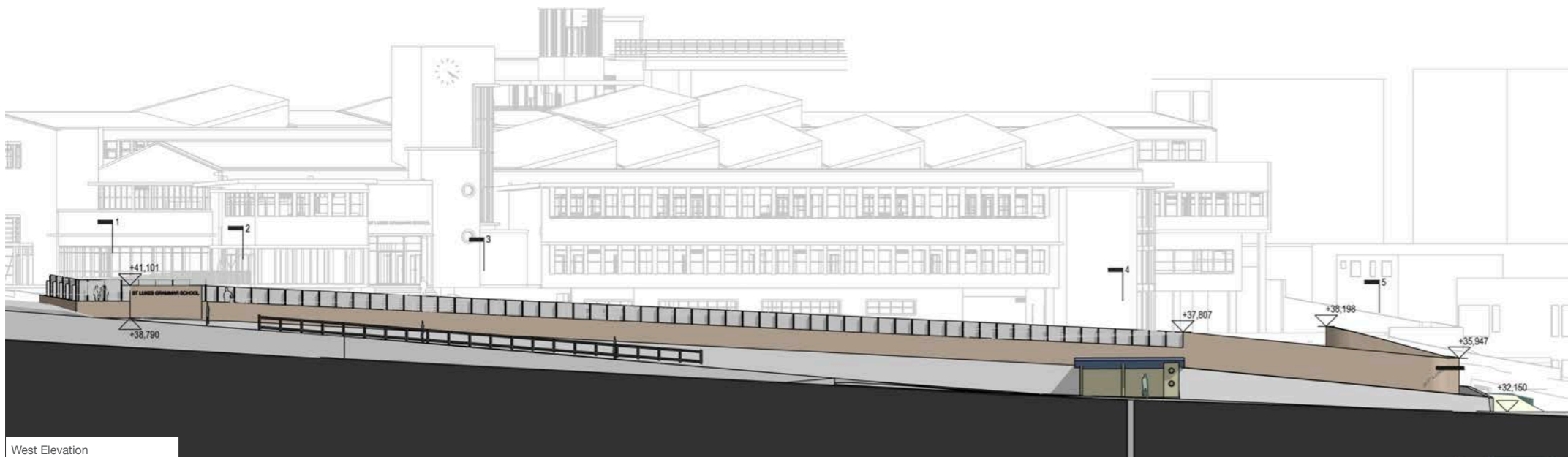
Section 4



Section 5



View from South



West Elevation

Noise Barrier Wall Design Statement

The design of the noise barrier wall was developed in consultation with the Landscape and Acoustic Consultant and has been reviewed by the Heritage Consultant and the GANSW Office.

Multiple options have been investigated and the final option is presented here.

The main design consideration was to provide a design that is complementary to the heritage fabric, comprising of the heritage building, the bus stop and the Stony Range Botanic Garden.

The noise barrier wall consists of three major elements:

- A solid masonry base with sandstone cladding to visually and physically anchor the wall to the ground and tie it into landscape.
- A clear acrylic top wall to allow visual connection into and from the site and to reduce the bulk.
- An array of vertical fins to take the shading fins on the western building facade for design continuity and to interpret the rhythm of the original timber balustrade along the Pittwater Street footpath.

Further design factors are to provide:

- A wall that satisfies the acoustic requirements.
- A wall that represents the school's public face.
- A wall that is solid and transparent.
- A wall with simple geometry and high quality materials to integrate it into the site and the landscape.
- A wall that is inviting with integrated access gates.
- A wall to provide a calm and neutral background for the school signage.