

The University of Sydney Health Precinct Stage 1 Project

BCA 2016 – SD Stage Final Assessment under BCA2016

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DOCUMENT ACCEPTANCE

	Name	Date
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1.0 Introduction and Documentation

1.1 Brief

This assessment involves a review of the design for the proposed new Health Precinct Stage 1 building for the University of Sydney with respect to the Building Code of Australia 2016 requirements.

We have reviewed the (attached) architectural documentation compiled to date for the major areas of compliance with the deemed-to-satisfy provisions of the Building Code of Australia. Where compliance with the deemed to satisfy provisions may not be possible a schedule of alternate solutions will need to be further investigated.

We have made every attempt to cover the main issues under Parts C, D, E, F, G and J of the Building Code of Australia. This is a staged design review which beds down design philosophy, considering its capability to achieve compliance with further design and detailed assessment across the next design phases and prior to issue of regulatory construction approvals.

Methodology is principally assessment of the available documentation.

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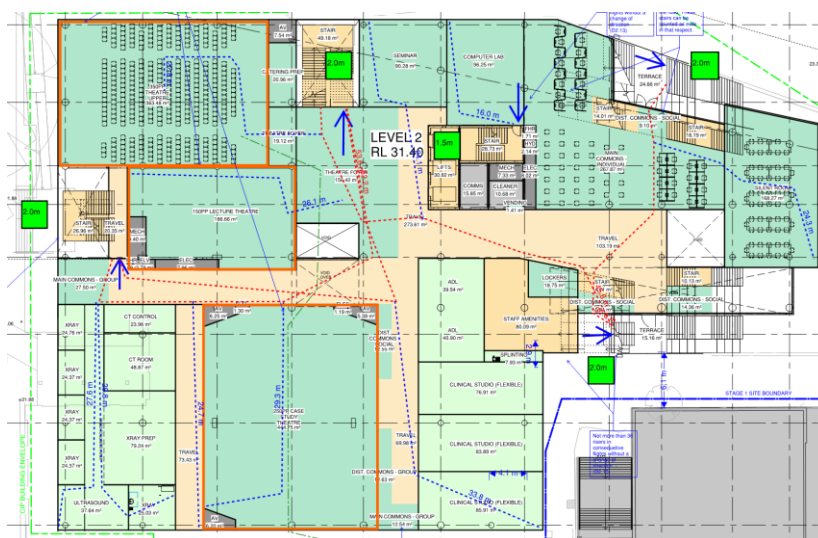
1.2 Proposed Development

The development is proposed to be located on the Camperdown Campus, Sydney. The site is in an overland flow path for stormwater and the design will accommodate this through innovative engineering design.

The building will house the health sciences faculty (relocated from Cumberland Campus) and the building is proposed to contain 9 storeys (no basements). We understand there are building envelope / height restrictions. Also that there may be plant at the rooftop or rooftop space that is useable to the building occupants or both.

The proposed new building will contain a Library component, Entry Space, Teaching and Learning Spaces, Lecture Theatres, Teaching and Learning Laboratories, Staff and Research Student Offices, Carparking (part ground floor) and ancillary plant. There is a degree of interconnectivity that the design will achieve which will need further refinement as the design progresses.

Level 2 – General footprint





2.0 Scope, Capability and Documentation

2.1 Scope and Capability

This report is the result of the review of the architectural drawings listed below, and as available at the time of assessment against the requirements of the National Construction Code - Building Code of Australia 2016. This report overviews the design philosophy and provides information for the designers to incorporate into the design as well as identify areas that do not meet the BCA requirements and may require some revision, additional detail or alternative solutions. Philip Chun are acting as Building Code Consultants appointed by Laing O'Rourke. The University has appointed their own certifier who is required to make their own independent assessments concerning compliance before issue of certification of design for the works.

2.2 Documentation and Drawings

Architectural documentation reviewed is listed as follows prepared by Billard Leece Partnership Pty Ltd.

K34-BLP-ARC-DRG-AA18-0001	K34-BLP-ARC-DRG-AA18-0401	K34-BLP-ARC-DRG-AA18-0801
K34-BLP-ARC-DRG-AA18-0101	K34-BLP-ARC-DRG-AA18-0501	K34-BLP-ARC-DRG-AA18-1001
K34-BLP-ARC-DRG-AA18-0201	K34-BLP-ARC-DRG-AA18-0601	
K34-BLP-ARC-DRG-AA18-0301	K34-BLP-ARC-DRG-AA18-0701	

2.3 Performance solutions and performance based assessment

Where compliance with the deemed to satisfy provisions is not readily achievable, performance based assessment and performance solutions will be proposed to demonstrate compliance with the BCA. Those identified to date in the design, have been scheduled below in this report. This may not be the final list of performance solutions as the building will undergo design development and other issues may arise that also affect ability to comply with the deemed to satisfy provisions of the Building Code of Australia.

This comes about due to the generic and prescriptive nature of the BCA with respect to the deemed to satisfy provisions and the inability for the document to be ultimately flexible for all building types and applications. This is the main reason the document allows performance based solutions, where meeting the performance requirements of the code, are deemed to also be compliant with the BCA.

Current anticipated performance solutions and other matters

- Distance of travel at some of the floors to the point of choice to an alternate exit will be greater than 20 metres. See plans assessed under Appendix A at this stage distance to an exit is up to –
 - 35m at levels 2, 5 and 7 and 30m to other floors;
 - Distances to an exit will exceed 40m - at this stage allow for up to 60m.
- In some cases the distance between exits will exceed 60 measured through the point of choice. See plans assessed under Appendix A. At this stage allow for –
 - 70m up to Level 3.
 - 80m at Level 4.
 - 100m at levels 5 and 6
 - 120m at 110m at Level 7
- Travel via non fire isolated stairs may exceed 80m to a road or open space, to be verified when fire isolation of stairs is scheduled.
- The building currently exceeds compartmentation limitations due to its interconnectivity with voids and open stairs. The proposal is to address this with active fire safety measures. See the Fire Safety engineers SD reporting for more information. Some elements will not be DTS and will be assessed by the Fire Safety engineer. This may involve fire rated glass, tyco drencher systems over glass, fire / smoke curtains. Stairs need to be numbered, color coded and clear widths



identified for further assessment and action. Some stairs will need enclosing with glass and others fire curtains or the like.

- Access for persons with disabilities may be rationalised in specific high risk and or specialist areas. Refer to the report by Philip Chun Accessibility.
- Level 3 to 8 (Grid C/4), the fire isolated stair is required to discharge to a road or open space. It is assumed that it transfers to the west at high level at the Level 2 or other such arrangement in order to comply.
- The mid floor fire isolated stair at Grids 3/G, must discharge to open space. A fire rated corridor is needed to connect the fire stair to the external façade of the building. It may be possible to have the corridor sterile but still able to be used as a thoroughfare, with auto closing doors. To be discussed with the Fire Safety Engineer. More than 2 doors connecting a fire passageway at one storey requires pressurisation of the corridor.
- Stairs need to be numbered and clear widths nominated to allow them to be tabulated and analysed with the fire safety engineer ?
- Compartmentation limits are exceeded. The proposal is to bring these areas and volumes down using active systems and therefore avoid the atrium provisions under G3 of the BCA2016. Refer to the Fire Safety Engineers Reporting. This will also avoid the building becoming a large isolated building under BCA2016.
- Discharge from the south western fire isolated stair (when it is altered to be a fire isolated stair), will cause occupants to skirt around the building in order to reach a roadway and cause them to pass within 6m of the external walls of the building. This needs to be discussed with the fire safety engineer and designers. An alternative solution may be achievable.
- The smoke control systems are likely to be bespoke systems that result from CFD modelling by the fire safety engineer with the mechanical engineers input.
- Access and egress to fire service pumps / tanks ect is to be detailed for compliance review.
- The plans attached to this report do not clearly show the designation of sanitary facilities. This will need to be a separate assessment when those details are provided. The allocation of the proposed gender neutral facilities needs discussion with the University and Certifier to ensure acceptance. See clause 3.5.1 of this report and also the Accessibility report.

These are subject to the assessment and agreement by a qualified experienced fire engineer prior to completion of the relevant phase of design. It is likely that as the design progresses, there will be changes to the alternative solution list.

The above issues will be discussed, where relevant, with Fire and Rescue NSW to mitigate any of their concerns and follow the requirements of the Environmental Planning and Assessment Act 1979 and Environmental Planning and Assessment Regulations 2000 where referral is required to the Fire Commissioner of Fire and Rescue NSW.



3.0 Building Code of Australia Assessment

3.1 Use, classification and high level design parameters

The development comprises of a new health science teaching and learning precinct with 9 levels. There may be a link connection to the adjacent university theatre building which would be further defined in design development.

According to the Building Code of Australia the following definitions assist in the classification of the buildings and their various parts.

Def - A3.1 Principles of classification

The classification of a building or part of a building is determined by the purpose for which it is designed, constructed or adapted to be used.

Def - A3.2 Classifications

The different parts of the building are classified as follows as they relate to the complex :

Class 5: - an office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.

Class 6: - a shop or other building for the sale of goods by retail or the supply of services direct to the public, including—

- (a) an eating room, **café**, restaurant, milk or soft-drink bar; or
- (b) a dining room, bar area that is not an assembly building, shop or kiosk part of a hotel or motel; or
- (c) a hairdresser's or barber's shop, public laundry, or undertaker's establishment; or
- (d) market or sale room, showroom, or service station.

Class 7: a building which is—

- (a) Class 7a — a carpark; or

Class 8: - a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale, or gain.

Class 9: a building of a public nature—

Class 9b — an assembly building, including a trade workshop, **laboratory or the like in a primary or secondary school**, but excluding any other parts of the building that are of another Class;



3.1.1 Use and Class

Class and use of the various levels of the building are as understood to be as follows:-

Building Matrix		
Levels	BCA Classification	Proposed Use
Level 0	9b Public Building 7a Car parking	Learning spaces, Entry, Car parking, ancillary plant and delivery area. Ancillary facilities.
Level 1	9b Public Building	Main Entry foyer, library collections, learning spaces, lecture theatres, ancillary plant and facilities.
Level 2	9b Public Building	Learning spaces, lecture theatres, ancillary plant and facilities.
Level 3	9b Public Building 5 Offices	Write up office, general common areas, consulting rooms, meeting rooms, Offices, ancillary plant and facilities.
Level 4	9b Public Building 5 Offices	Teaching and learning spaces, Offices, ancillary plant and facilities.
Level 5	5 Offices	Offices, ancillary plant and facilities.
Level 6	5 Offices	Offices, ancillary plant and facilities.
Level 7	5 Offices	Offices, ancillary plant and facilities.
Level 8 (rooftop)	Ancillary Use	Plant.

Notes –

In relation to the use of the building, we are advised –

- a) that the wet laboratory use (formerly proposed) is no longer proposed.
- b) Teaching and research labs may contain medical gases but are not of the traditional wet / chemistry type laboratory, they are more akin to non-patient care areas used by allied health within a hospital. These are teaching and learning spaces.
- c) Clients that are the subject of training / treatment remain ambulatory.
- d) The building will accommodate allied health faculties.
- e) The facilities in parts of the building will simulate an allied health facility within a modern hospital. Thus, there will be therapies, treatment and research carried out in these areas as part of programs involving hospitals, and private companies.
- f) Overall, we understand that the predominate use is a school / university.
- g) We are advised that the work carried out is not expected to render the participants non-ambulatory. Therefore the classification of 9b School is appropriate for these parts of the building.
- h) In addition, the rooms labelled as having “beds” are not used for sleeping / overnight.



3.1.2 Generic Building requirements

Some generic building requirements are as follows including the type of construction and rise in storey.

Parameters	Item	Comments
Rise in storey	8	Excludes rooftop if it has any structures on the roof that may be considered a storey.
Effective height	>25m but <50m	RL 52.4 – RL 23.0 = 29.4m
Type of construction	A	See following section for fire ratings required.
Maximum permitted fire compartment area and volume	5, 9b Area = 8000m ² Volume = 48000m ³ 6, 7, 8 Area = 5000m ² Volume = 30000m ³	A compartmentation strategy is being developed by the designers into design development as many levels are interconnected by void spaces. Most bespoke buildings of this nature, will have a combination of fire rated, or drencher protected glass and fire and smoke construction. If this varies from the deemed to satisfy provisions of the Building Code of Australia then may be assessed and justified through fire engineering.
Generic fire ratings	FRL 120/120/120	Generally, the whole of the structure needs to comply with a 120-fire rating except where permitted otherwise by BCA2016.
External Walls	External façade to be non-combustible and in accordance with AS1530.1 Loadbearing external walls require an FRL as per BCA Spec C1.1 provisions for type A construction.	The buildings' façade is to be non-combustible and all facings and claddings accordingly tested. Choice of composite materials needs to be verified through provision of tested system reports / codemark certificates and / or fire safety engineering assessment. The external walls and fire rating requirements will be addressed in the DD phase of design.
General Atrium requirements	In a sprinkler protected building, connection of more than 3 stories requires assessment against the atrium provisions. The building will have an atrium and hence needs to meet Specification G3.8 of the BCA	The compartmentation strategy is proposed to negate the need to apply these provisions through the use of active fire safety systems provided to limit connectivity on activation of a fire alarm. This forms part of the Fire Safety Assessment (alternative solutions report) by the Fire Safety Engineer.
Large isolated building	Unless compartmented to comply, The building will be a large isolated building.	A large isolated building will require complying perimeter access. This could not be provided due to site restraints. Therefore, some compartmentation is required. As stated above for atrium provisions, a compartmentation strategy is proposed to negate the need to apply these provisions through the use of active fire safety systems provided to limit connectivity on activation of a fire alarm likely to form part of the alternative solution assessment.



3.2 Fire rating

3.2.1 General fire rating requirements

The assumed scope of work to the building will require that it is built to current BCA 2016 requirements. The building will need to be constructed in Type A construction.

Building Matrix			
Levels	BCA Class	Use	Requirements
Level 0	9b Public Building 7a Car parking	Learning spaces, Entry, Car parking, ancillary plant, delivery area and ancillary facilities.	Generic fire resistance levels: Class 5, 7a and 9b: 120/120/120 (as per Specification C1.1 of BCA2016)
Level 1	9b Public Building	Main Entry foyer, library collections, learning spaces, lecture theatres, ancillary plant and facilities.	
Level 2	9b Public Building	Learning spaces, lecture theatres, ancillary plant and facilities.	
Level 3	9b Public Building 5 Offices	Write up office, general common areas, consulting rooms, meeting rooms, Offices, ancillary plant and facilities.	
Level 4	9b Public Building 5 Offices	Teaching and learning spaces, Offices, ancillary plant and facilities.	
Level 5	5 Offices	Offices, ancillary plant and facilities.	
Level 6	5 Offices	Offices, ancillary plant and facilities.	
Level 7	5 Offices	Offices, ancillary plant and facilities.	
Rooftop	Ancillary Use	Plant.	

The roof covering is to be non-combustible construction where the building is provided with sprinkler protection. If the roof is to be trafficable for use by building occupants (not only maintenance), the roof or the part of the roof should be concrete with minimum FRL 120/120/120.

The following services are to be separated from the remainder of the building via a 120/120/120 FRL:-

- At level 0, the car park is to be fire separated from the remainder of the building.
- A fire rated wall at Grid L at Level 0 will provide a horizontal exit at the eastern end of the breakout corridor.
- Switch rooms
- Lift motor rooms
- Boilers
- Essential services generator systems
- Exit pressurization systems
- Kitchen Exhaust systems
- Fire Control Rooms if required
- Rooms containing UPS or Batteries (where exceeding BCA capacity)

The **electrical substation** if located on the ground floor level of the building must be separated from any other part of the building by construction having an FRL of not less than -/180/180 and have self-closing fire doors with a fire rating of -/180/30 (this will be an Energy Australia requirement rather than a BCA requirement, however should be confirmed with the electricity authority).



3.2.2 Spandrels

Spandrel separation under C2.6 does not apply to sprinkler protected buildings.

3.2.3 Fire compartment areas and volumes

The maximum area and maximum volume of fire compartments allowed as specified in Part C2.2 of the BCA for Type A construction is –

5, 9b

Area = 8000m²

Volume = 48000m³

6, 7, 8

Area = 5000m²

Volume = 30000m³

The carpark will be separated from Level 0 by a fire rated wall to assist with the strategy of limiting compartment sizes.

As stated previously, a strategy is to be formed to satisfy the performance requirements for spread of fire within a building and smoke hazard management.

Note – compartmentation will require active systems such as smoke curtains, exhaust and wall drenchers over fixed glazing. Complex smoke modelling will be required (CFD). There is likely to be a number of viable solutions to be resolved between the Fire Safety Engineer and Architects.

3.2.4 Protection of Openings

From the drawings provided (Appendix A), the new building is located more than 3m from allotment boundaries. The new building shares the allotment with the Bosch buildings to the south. The distance between the existing and new buildings was measured from plans to be less than 6m in some locations. Therefore, in Design Development phase these distances will be confirmed and the new external walls within 6m will need to be confirmed as either loadbearing or non loadbearing. This will determine the need to provide protection to any openings in those affected walls.

3.2.5 Exit construction and provision

The designers have provided an estimated population for each occupied floor level based on the clients brief. The building owner has a right to determine the population catered for at each floor under D1.13 of the BCA.

From the design to date, there are 2 fire isolated stairs shown distributed across the floor plates. These cannot discharge within the ground floor and will need further design resolution to provide discharge to the exterior of the building. In addition, the stairs require encapsulation by fire rated materials. This is not yet resolved at the lower floor levels and will form part of discussions between the Architects and the Fire Safety Engineer.

There are a number of non fire isolated stairs shown on the plans. These will also be subject to further design development. Where connecting more than 3 storeys they are required to be fire isolated and discharge directly to a road or open space. Some of these may be ultimately treated as communication stairs only and solutions will be developed that are either DTS or meet the performance requirements of the BCA to compartment the building. The Architect has indicated that some elements of the fire isolated stairs are proposed to be glass. The solutions will become clearer in the Design Development Phase.



3.3 Egress

3.3.1 Principles

The building is in a concept design stage. With the exception of where fire engineering and performance solutions are to be used, the buildings' egress system is required to meet the following general principles:

DTS Principles

- Every floor of the building is provided with at least two exits.
- To every floor, the maximum distance of travel
 - to an exit to floors is to be 40 metres, and
 - to a point of choice is to be 20 metres
 - between alternate exits is to be 60 metres.
- Generally to all floors and uses, the distance between alternate exits is to be **not less than 9 metres**.
- The construction and discharge of stairs, landings, thresholds, balustrades and handrails will need to meet the requirements of D2 and D3 of the BCA and AS1428.1-2009.
- Fire corridors provided for egress will achieve the same fire rating as that provided to their associated fire-isolated stairs.
- The point of discharge of the fire-isolated stairs is to be to open space and not to an undercroft area.
- Where a path of travel from the point of discharge of a fire-isolated exit necessitates passing within 6 metres of any part of an external wall of the same building, measured horizontally at right angles to the path of travel, that part of the wall must have an FRL of not less than 60/60/60 and any openings protected internally in accordance with C3.4, for a distance of 3 m above or below the level of the path of travel, or for the height of the wall, whichever is the lesser.
- All paths of travel are to be a minimum of 1000mm in clear width.
- In a class 9b building, not more than 36 risers are permitted in consecutive flights without a change of direction (**needs to be verified in design**).

Where these are not met, in many cases performance solutions can be provided to justify the variances according to fire engineering. See fire engineering summary for variances from deemed to satisfy provisions.

If some areas will be to the exclusion of others (such as through leasing or for security reasons), it needs to be considered that occupants outside that area are not permitted to enter that area and use the fire stair within that area.

Additional notes –

a) Central open stairs - The central open stairs **servicing the building are not suitable for emergency use**.

b) The main internal building fire egress stairs that serve / pass through, all floors are required to be fire isolated and pressurised.

c) Leasing or subdivision - The main internal building fire egress stairs are located at separate parts of the building. We are advised the stairs are not scissor stairs. Therefore, both stairs are required to be available and able to be reached, by all occupants at each floor level. This will limit the leasing of parts of the building where such sub lease would not permit free access to the required fire stairs. The issue is that leasing an area "to the exclusion of other persons" (sole occupancy unit) means that access to an exit can be denied when it is most needed, contrary to the BCA.

d) All out evacuation - Rather than staging evacuation of the building on fire alarm, the building owner require has asked the designers to ensure that multiple floor evacuation will be possible. The extent of "all out, evacuation" will be limited to that calculated by the Fire Safety Engineer and SSISEP designer as part of their design.



3.3.2 Populations and aggregate exits

Based on the populations provided, the following table shows the aggregate width required and that currently provided.

Sanitary facilities and fresh air supply are the other two main limitation factors affecting permitted population.

Population / Egress provision based on the DTS provisions of the BCA and current plans. Populations taken from the BLP Summary of Staff and student numbers as we understand has been agreed with the building owner. **Level 7 population was not previously specified and therefore the nominated population of 260 persons needs to be verified with designers and the client including a breakdown of staff and students.**

Levels	Proposed maximum population	Required aggregate width (DTS)	Assumed aggregate width provided (see mark-up's) current design	Comments (in relation to D1.6 of BCA2016)
Level 0	590	7m	11m	complies
Level 1	907	7.5m	7.5m	complies
Level 2	1424	12.5m	9.5m	Shortfall – 3m
Level 3	363	4m	9.5m	complies
Level 4	396	4m	3m	Shortfall – 1m
Level 5	411	4m	3m	Shortfall – 1m
Level 6	396	4m	3m	Shortfall – 1m
Level 7	260	2.5m	3m	complies
Level 8 Rooftop	Maintenance <100	2m (required because every storey must have 2 exits).	3m	complies

Level 7 population not provided. At this stage assumed based on 1 person per 8m².



3.3.3 Access Part D3

As a minimum the compliance of the building will need to be in accordance with D3 of the Building Code of Australia.

At the least the following need to be covered:-

- D3.2 requires that access is provided to and within the entrance floor; and any other floor to which vertical access by way of a ramp, step ramp or kerb ramp complying with AS 1428.1 or a passenger lift is provided. Accessible entry points must be within 50m on non accessible entry points. The main entry points are to be accessible and not less than 50% of entrance doors overall are to be accessible.
- External access to a building required to be accessible must be in accordance with this Part and AS 1428.1 from the car park for the building to all entrances.
- Signage required identifying access for the disabled to lift banks, entrances and sanitary facilities is also to be provided to the building. Braille and tactile signage complying with AS 1428.1 is required to identify each common area sanitary facility (not just facilities for persons with disabilities).
- Tactile indicators complying with AS 1428.4 must be installed to warn vision impaired occupants as they approach a stair, escalator, travelator, a ramp, step ramp or kerb ramp. This applies to all stairs with the exception of the fire isolated stairs that are used purely for fire escape. Cross use fire isolated stairs need to comply with D3.8.
- Provision of Accessible and Ambulant Sanitary Facilities at each floor.
- Wheelchair seating is to be accommodated as per D3.9 where fixed seating is provided.
- Hearing augmentation is to be provided where required under D3.7.
- Accessible carparking is required at the rate of 1 space per 100 spaces.

The access consultant will need to assess and review the access requirements to the building complex as part of the schematic design phase hence their reporting will bear on the design outcomes and suitability of the design. In addition the reporting will include DDA recommendations.



3.4 Fire Systems

The following is a summary of the services likely to be required and to be provided to the building.

3.4.1 Fire services

Essential Fire Safety Measures - Likely to be required In accordance with Standards and references listed within BCA2016
Access panels, doors and hoppers to fire-resisting shafts
Automatic fail-safe devices
Automatic fire detection and alarm systems
Automatic fire suppression systems
Emergency lifts
Emergency lighting
Sound systems and intercom systems for emergency purposes
Exit signs
Fire Control Centre
Fire dampers
Fire doors
Fire hydrant system
Fire seals protecting openings in fire-resisting components
Fire curtains
Fire shutters
Fire windows
Hose reel systems
Lightweight construction
Mechanical air handling systems <ul style="list-style-type: none"> - Mechanical exhausts - Zone smoke control throughout - Smoke exhaust to theatres (alternative solution proposed to delete smoke exhaust to the lecture theatres). - Stair pressurisation (All fire isolated stairs)
Stair re-entry
Portable fire extinguishers
Standby power systems
Wall-wetting sprinkler and drencher systems
Warning and Operational Signs
Possible – Fire and smoke curtains
Possible – Tyco wall wetting sprinkler system
Possible – Non-Mandatory – Place of refuge within Fire Isolated stairs
Fire Safety Engineering Reporting including NSWFR referral and recommendations



3.5 Health and Amenity

3.5.1 Sanitary facilities

The following criteria detail the required sanitary facilities to be provided.

The DTS provisions of the BCA2016 require that building occupants are to be assessed based on 50% male and 50% females or by specification by the client. Facilities are usually provided on this basis according to F2 of the Building Code of Australia. The client has, we understand, kept with the 50% distribution for Females and 50% for Males.

In this case, the Architects, working to the clients brief, have proposed that in addition to Male / Female and Unisex accessible sanitary facilities, the client requires separate facilities that will be labelled “non gender”.

As the BCA2016 provides no provision or guidance on the specific assessment of non gender sanitary facilities. In regulatory terms this will need discussion with the certifier as the design is progressed. At this stage we propose to allocate these facilities as female, one for staff and one for students where they occur (as that seems to be conservative). The certifier may require an alternative solution to be written to address some aspect of these facilities.

If the university has an expectation that ONLY non-gender persons are to use those facilities then they may not be able to be counted at all in the BCA assessment. The access consultant has requested that at least one of the non-gender facilities is designed as ambulatory.

- An accessible WC is required at every floor level except the roof;
- The BCA2016 requires that staff and students have separate facilities. The designer will need to separate the populations into staff and students in order for the numbers to be verified. If the non-gender facilities are to be used by staff and students, this may trigger an alternative solution being required.

3.5.2 Facilities for persons with disabilities

In the **class 5 and 9b** areas the following applies:-

Class 5, 6, 7, 8 or 9 building

Where F2.3 requires closet pans—

- (a) 1 on every storey containing sanitary compartments; and
- (b) where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.

Ambulant facilities

At each bank of toilets where there are one or more toilets in addition to an accessible unisex sanitary compartment at that bank of toilets, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS 1428.1 must be provided for use by males and females.

An Accessibility report is appropriate early in the next design phase when the occupant numbers are confirmed.

3.5.3 Swing and operation of doors to the WC's

Doors to fully enclosed sanitary compartments to open outwards, or slide or have 1.2 meters clear space between door and closet plan or be readily removable from the outside of the sanitary compartment.



3.5.4 Light and ventilation

Ventilation
All classes of buildings

Natural ventilation in accordance with F4.6 or mechanical ventilation to AS 1668.2 is to be provided. This is readily achievable.

Artificial lighting

Light to the building must be provided in accordance with F4.4 of the Building Code of Australia. All areas not covered by natural light to be artificially lit with the system complying with AS/NZS 1680.0.

The BCA required natural light to be provided to general classrooms. It is important that adequate natural light is provide, appropriate to the use of the space. The Architects / Electrical Engineers and Lighting Consultants will need to consider this in design of the internal layout.

3.5.5 Room Sizes

The ceiling minimum height of 2.4m is required to areas accommodating less than 100 persons. Generally 2.7m is required except corridors, sanitary facilities and storage areas, where it may be 2.1m. Compliance is readily achievable. Plant rooms need to be checked and the correct heights allowed in the design.

3.7 Part G Ancillary Provisions

Specialist requirements also apply to the building and are as per Part G of the Building Code of Australia

3.7.1 Provision of cleaning windows **NSWG1.101**

A building must provide for a safe manner of cleaning any windows located 3 or more storey above ground level and a building satisfies this requirement where—

- (i) the windows can be cleaned wholly from within the building; or
- (ii) provision is made for the cleaning of the windows by a method complying with the Occupational Health and Safety Act 2000 and regulations made under that Act.

The design is to comply – architects, and structural engineers to note.

3.7.2 Refrigerated chambers strong rooms and vaults **G1.2**

Where there are refrigerated chambers to the building for the laboratory uses, there are specific requirements for escape, lighting, bells and signage including audible and visual alarms.

The design is to comply – architects, and structural engineers to note.

3.7.3 Atrium Construction and Specification **G3.8**

This is a detailed part of the BCA. It is proposed to compartment the building using alternative fire engineered solutions and negate the need for compliance with these provisions.

3.8 Part J – Energy Efficiency

The proposed building must be designed in accordance with the requirements of Part J of the BCA in terms of Energy Efficiency. The requirements are to be considered and integrated in the design prior to certification for construction. The following Components must be addressed in design.

- Part J1 Building Fabric
- Part J2 Glazing
- Part J3 Building Sealing
- Part J5 Air conditioning and ventilation systems
- Part J6 Artificial Lighting and Power - whole building
- Part J7 Hot Water Supply



Part J8 Access for maintenance and facilities for monitoring.

It is suggested that due to the complexity of the design, the building will need to be modelled according to JV3 by a qualified ESD consultant otherwise the design needs to be compiled according to the deemed to satisfy provisions of the Building Code of Australia.



4.0 Appendix A – Table of fire ratings

Table 3 - TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building-FRL: (in minutes)	
	Structural adequacy/Integrity/Insulation	
	5, 7a or 9	7b or 8
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any fire-source feature to which it is exposed is-		
For loadbearing parts		
Less than 1.5m	120/120/120	240/240/240
1.5 to less than 3m	120/90/90	240/240/180
3m or more	120/60/30	240/180/90
For non-loadbearing parts		
Less than 1.5m	-/120/120	-/240/240
1.5 to less than 3m	-/90/90	-/240/180
3m or more	-/-/-	-/-/-
EXTERNAL COLUMN not incorporated in an external wall, where the distance from any fire-source feature to which it is exposed is-		
Less than 3m	120/-/-	240/-/-
3m or more	-/-/-	-/-/-
COMMON WALLS, FIRE WALLS	120/120/120	240/240/240
INTERNAL WALLS		
Fire-resisting lift and stair shafts-		
Loadbearing	120/120/120	240/120/120
Non-loadbearing	-/120/120	-/120/120
Bounding public corridors, public lobbies and the like-		
Loadbearing	120/-/-	240/-/-
Non-loadbearing	-/-/-	-/-/-
Between or bounding sole-occupancy units-		
Loadbearing	120/-/-	240/-/-
Non-loadbearing	-/-/-	-/-/-
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion		
Loadbearing	120/90/90	240/120/120
Non-loadbearing	-/90/90	-/120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS-		
	120/-/-	240/-/-
Floors	120/120/120	240/240/240
Roofs	120/60/30	240/90/60
	No FRL required to the roof if non-combustible and if the building is fully sprinkler protected.	

Note - There are various provisions in the BCA2016 prescribing required fire resistance. This table is included as a simple reference.



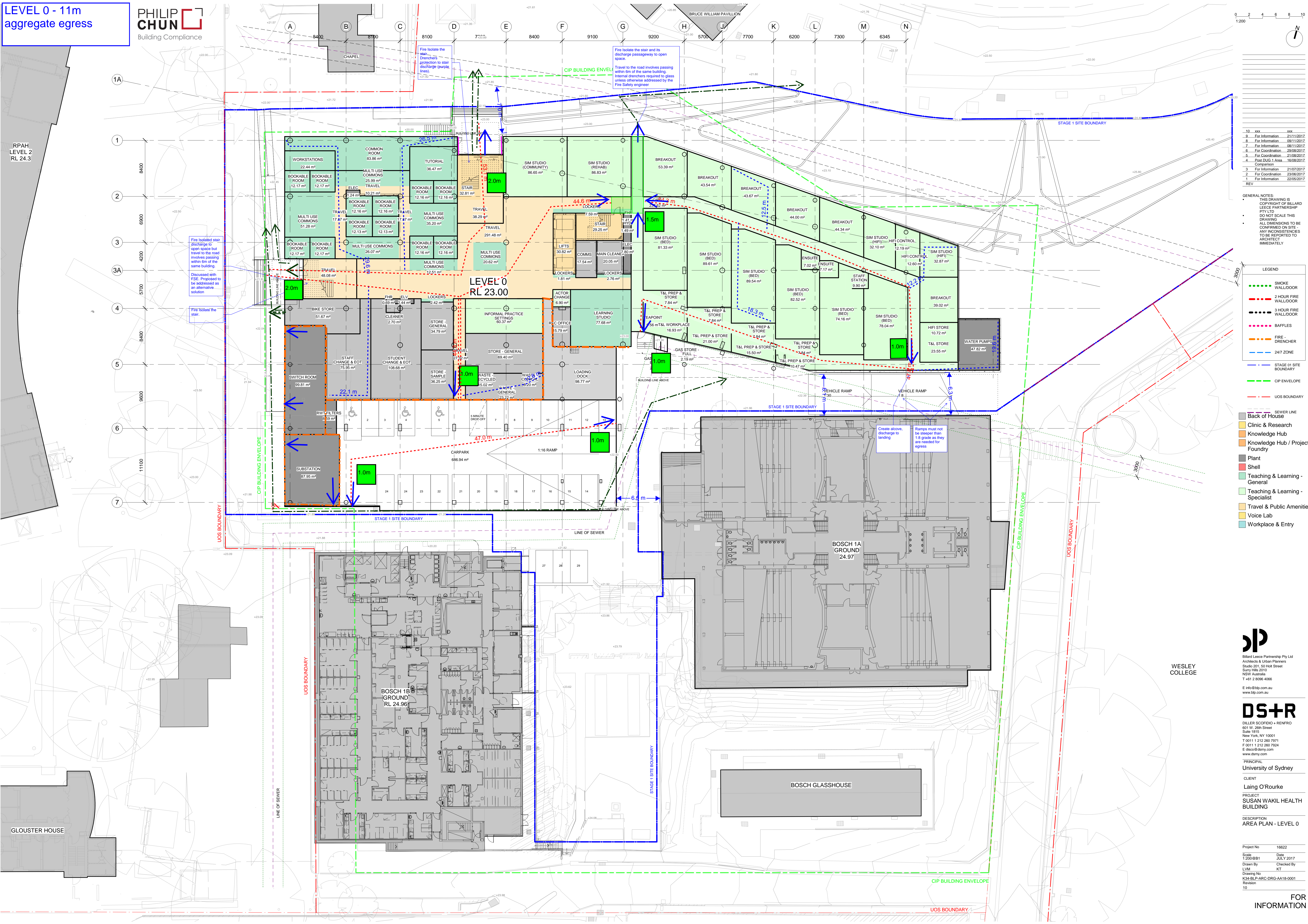
5.0 Appendix B - Comments on drawings

LEVEL 0 - 11m aggregate egress



RPAH LEVEL 2 RL 24.3

GLOUSTER HOUSE



REV	DESCRIPTION	DATE
10	xxx	xxx
9	For Information	21/11/2017
8	For Information	09/11/2017
7	For Information	08/11/2017
6	For Coordination	29/08/2017
5	For Coordination	23/08/2017
4	Post DSG 1 Area - 16/08/2017 Comparison	
3	For Information	21/07/2017
2	For Coordination	23/06/2017
1	For Information	22/05/2017

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 ALL DIMENSIONS TO BE CONFIRMED ON SITE.
 ANY INCONSISTENCIES TO BE REPORTED TO ARCHITECT IMMEDIATELY.

- LEGEND**
- SMOKE WALLDOOR
 - 2 HOUR FIRE WALLDOOR
 - 3 HOUR FIRE WALLDOOR
 - BAFFLES
 - FIRE DRENCHER
 - 24/7 ZONE
 - STAGE 1 SITE BOUNDARY
 - CIP BUILDING ENVELOPE
 - UOS BOUNDARY

- SEWER LINE
- Back of House
- Clinic & Research
- Knowledge Hub
- Knowledge Hub / Project Foundry
- Plant
- Shell
- Teaching & Learning - General
- Teaching & Learning - Specialist
- Travel & Public Amenities
- Voice Lab
- Workplace & Entry

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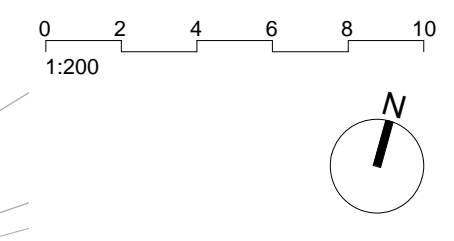
PRINCIPAL
 University of Sydney
 CLIENT
 Laing O'Rourke
 PROJECT
 SUSAN WAKIL HEALTH BUILDING

DESCRIPTION
 AREA PLAN - LEVEL 0

Project No	16622
Scale	1:200/BB1
Date	JULY 2017
Drawn By	LVM
Checked By	KT
Drawing No	K34-BLP-ARC-DRG-AA18-0001
Revision	10

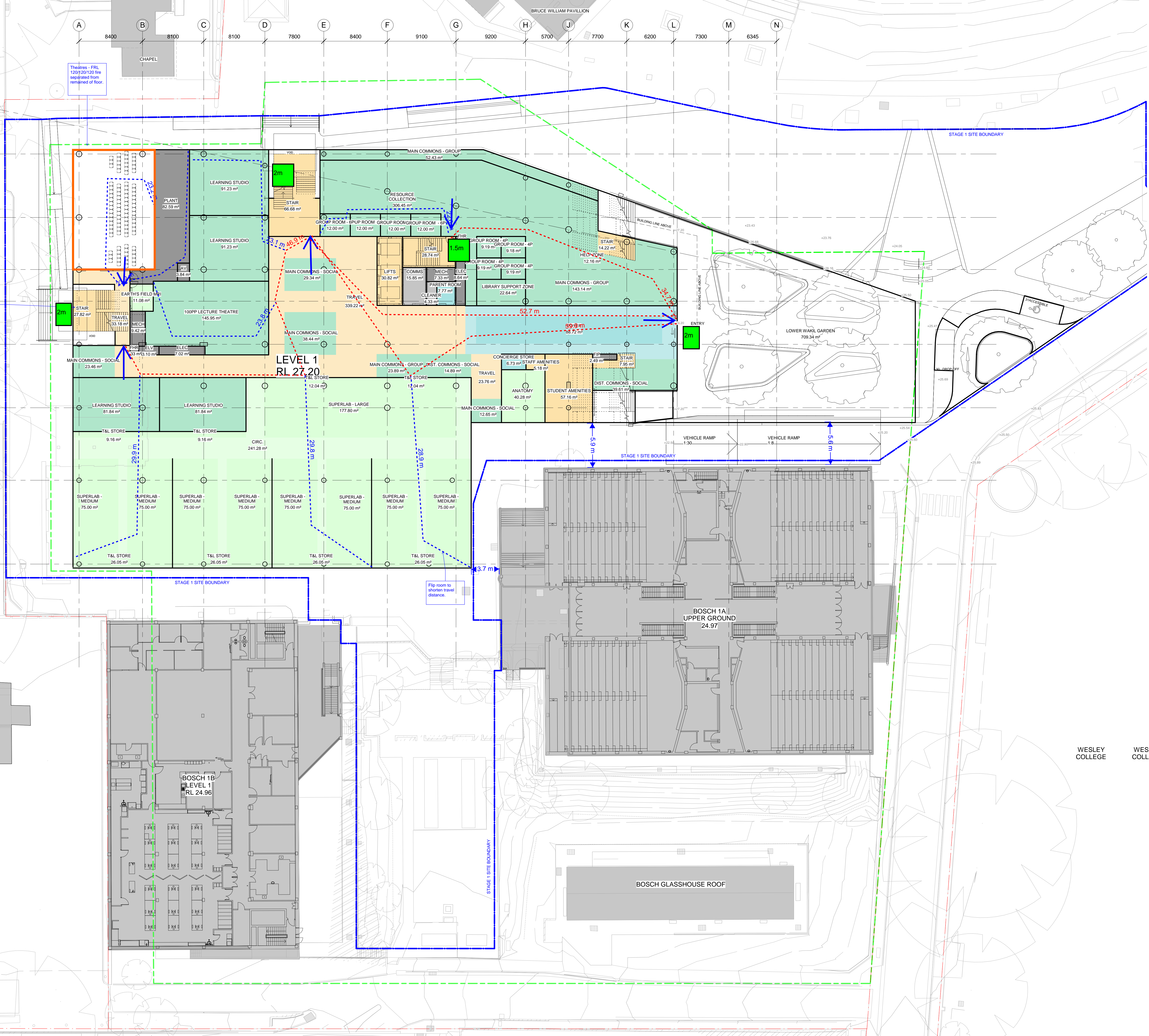
FOR INFORMATION

LEVEL 1 - 7.5m
aggregate egress



RPAH LEVEL 3
RL 27.9

GLOUSTER HOUSE



9	For Information	21/11/2017
8	For Information	09/11/2017
7	For Information	08/11/2017
6	For Coordination	29/08/2017
5	For Information	23/08/2017
4	Post-DWG 1 Area	16/08/2017
3	For Information	21/07/2017
2	For Coordination	23/06/2017
1	For Information	22/05/2017

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- LEGEND**
- SMOKE WALL/DOOR
 - 2 HOUR FIRE WALL/DOOR
 - 3 HOUR FIRE WALL/DOOR
 - BAFFLES
 - FIRE DRENCHER
 - 24/7 ZONE
 - STAGE 01 SITE BOUNDARY
 - CP ENVELOPE
 - UOS BOUNDARY

- Back of House
- Clinic & Research
- Knowledge Hub
- Knowledge Hub / Project Foundry
- Plant
- Shell
- Teaching & Learning - General
- Teaching & Learning - Specialist
- Travel & Public Amenities
- Voice Lab
- Workplace & Entry

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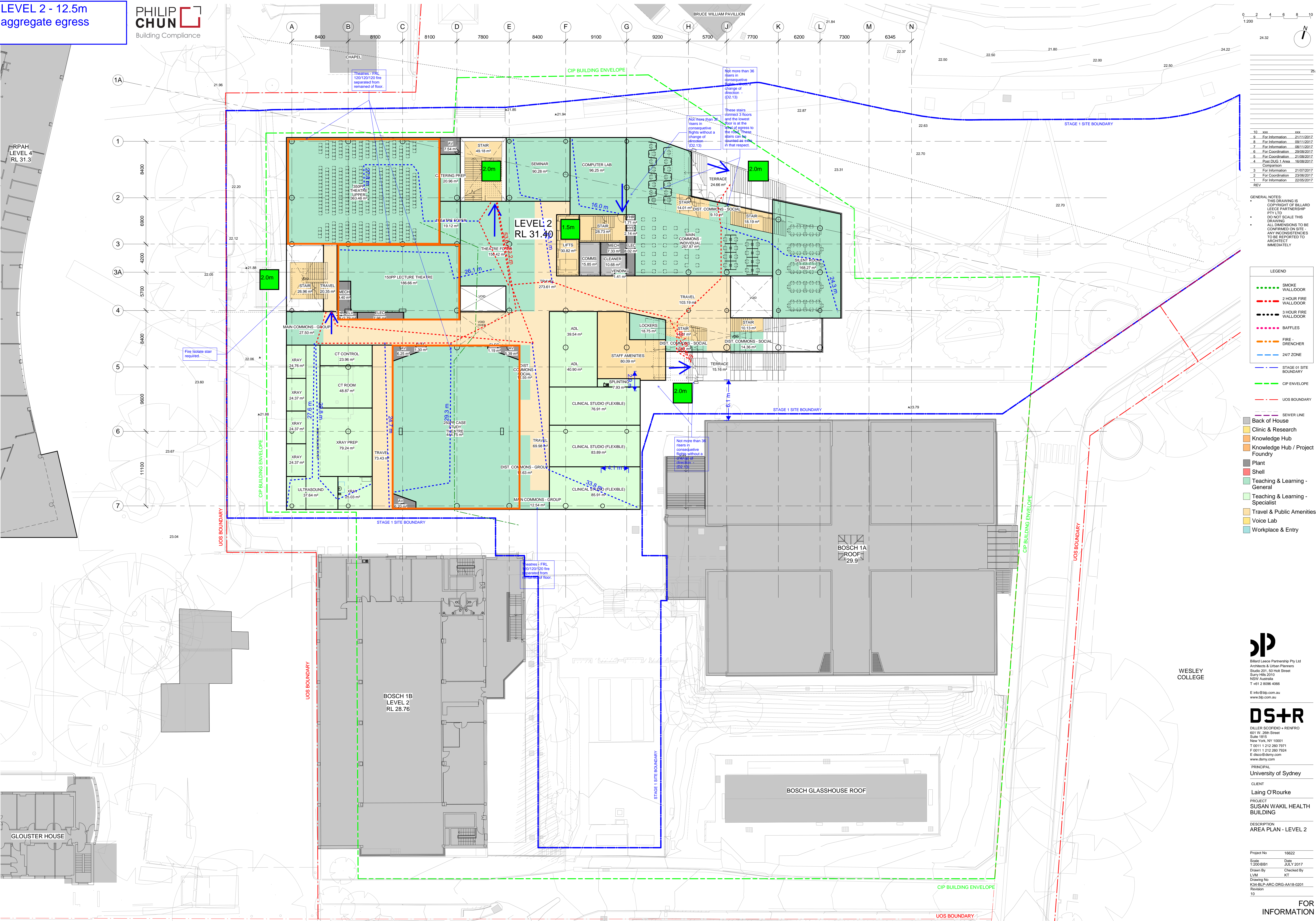
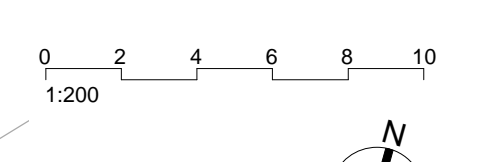
PROJECT
SUSAN WAKIL HEALTH BUILDING

DESCRIPTION
AREA PLAN - LEVEL 1

Project No	16622
Scale	1:200/BB1
Date	JULY 2017
Drawn By	LVM
Checked By	KT
Drawing No	K34-BLP-ARC-DRG-AA18-0101
Revision	9

FOR INFORMATION

LEVEL 2 - 12.5m aggregate egress



REV	DESCRIPTION	DATE
10	xxx	xxx
9	For Information	21/11/2017
8	For Information	09/11/2017
7	For Information	08/11/2017
6	For Coordination	29/08/2017
5	For Coordination	23/08/2017
4	Post-DWG 1 Area - 16/08/2017 Comparison	
3	For Information	21/07/2017
2	For Coordination	23/06/2017
1	For Information	22/05/2017

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- LEGEND**
- SMOKE WALLDOOR
 - 2 HOUR FIRE WALLDOOR
 - 3 HOUR FIRE WALLDOOR
 - BAFFLES
 - FIRE DRENCHER
 - 24/7 ZONE
 - STAGE 01 SITE BOUNDARY
 - CIP ENVELOPE
 - UOS BOUNDARY

- Back of House
- Clinic & Research
- Knowledge Hub
- Knowledge Hub / Project Foundry
- Plant
- Shell
- Teaching & Learning - General
- Teaching & Learning - Specialist
- Travel & Public Amenities
- Voice Lab
- Workplace & Entry

WESLEY COLLEGE

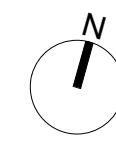
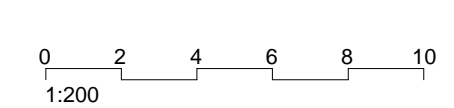


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 PROJECT
 SUSAN WAKIL HEALTH BUILDING

DESCRIPTION
 AREA PLAN - LEVEL 2
 Project No 16622
 Scale 1:200/BB1 Date JULY 2017
 Drawn By LVM Checked By KT
 Drawing No K34-BLP-ARC-DRG-AA18-0201
 Revision 10

FOR INFORMATION 17/01/2018 11:52:17 AM

LEVEL 3 - 9.5m aggregate egress



REV	DESCRIPTION	DATE
9	For Information	21/11/2017
8	For Information	09/11/2017
7	For Information	08/11/2017
6	For Coordination	29/08/2017
5	For Coordination	23/08/2017
4	Post-ENIG 1 Area - 16/08/2017 Comparison	
3	For Information	21/07/2017
2	For Coordination	23/06/2017
1	For Information	22/05/2017

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LEGEND

- SMOKE WALL/DOOR (Green dashed line)
- 2 HOUR FIRE WALL/DOOR (Red dashed line)
- 3 HOUR FIRE WALL/DOOR (Black dashed line)
- BAFFLES (Pink dashed line)
- FIRE DRENCHER (Orange dashed line)
- 24/7 ZONE (Blue dashed line)
- STAGE 01 SITE BOUNDARY (Blue solid line)
- CIP ENVELOPE (Green dashed line)
- UOS BOUNDARY (Red dashed line)

- Back of House (Grey)
- Clinic & Research (Light Green)
- Knowledge Hub (Orange)
- Knowledge Hub / Project Foundry (Light Orange)
- Plant (Dark Green)
- Shell (Red)
- Teaching & Learning - General (Light Green)
- Teaching & Learning - Specialist (Light Green)
- Travel & Public Amenities (Light Orange)
- Voice Lab (Yellow)
- Workplace & Entry (Light Blue)

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PROJECT
 SUSAN WAKIL HEALTH BUILDING

DESCRIPTION
 AREA PLAN - LEVEL 3

Project No	16622
Scale	1:200/BB1
Date	JULY 2017
Drawn By	LVM
Checked By	KT
Drawing No	K34-BLP-ARC-DRG-AA18-0301
Revision	9

FOR INFORMATION

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RPAH LEVEL 5
 RL 34.29

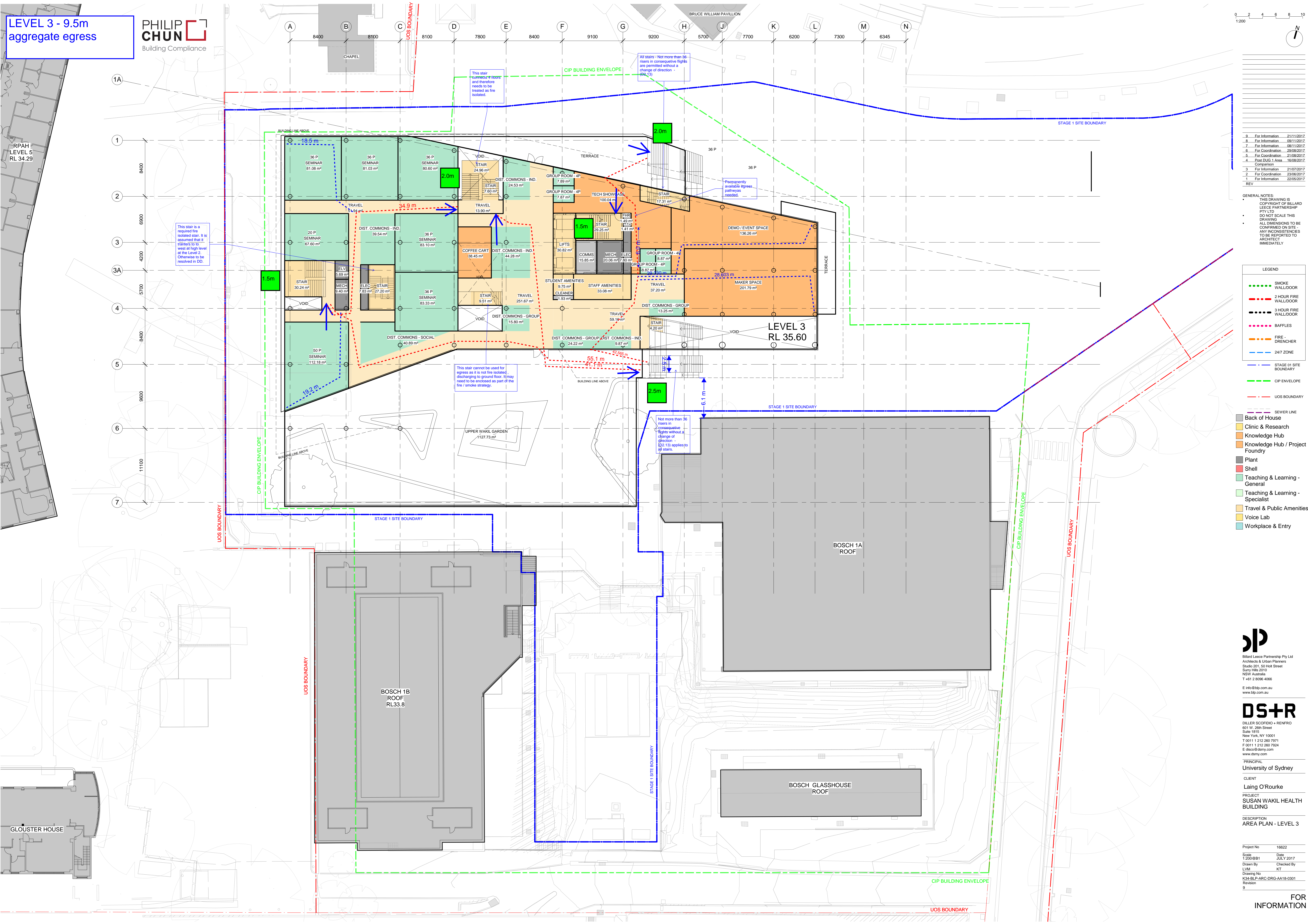
GLOUSTER HOUSE

BOSCH 1B
 ROOF
 RL33.8

BOSCH 1A
 ROOF

BOSCH GLASSHOUSE
 ROOF

LEVEL 3
 RL 35.60



This stair is a required fire isolated stair. It is assumed that it transfers to level at high level at the Level 2. Otherwise to be resolved in DD.

This stair connects rooms and therefore needs to be treated as fire isolated.

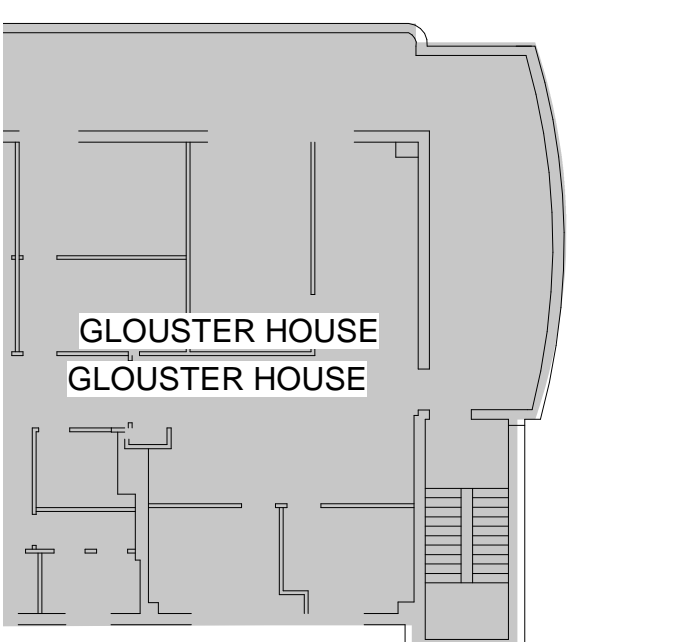
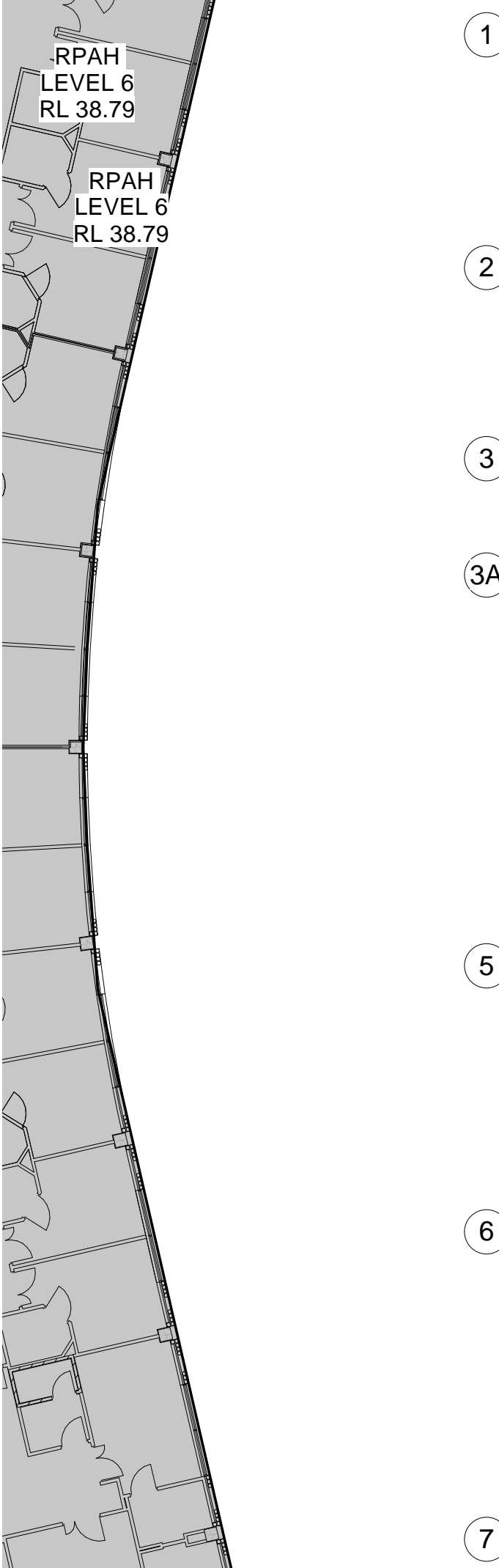
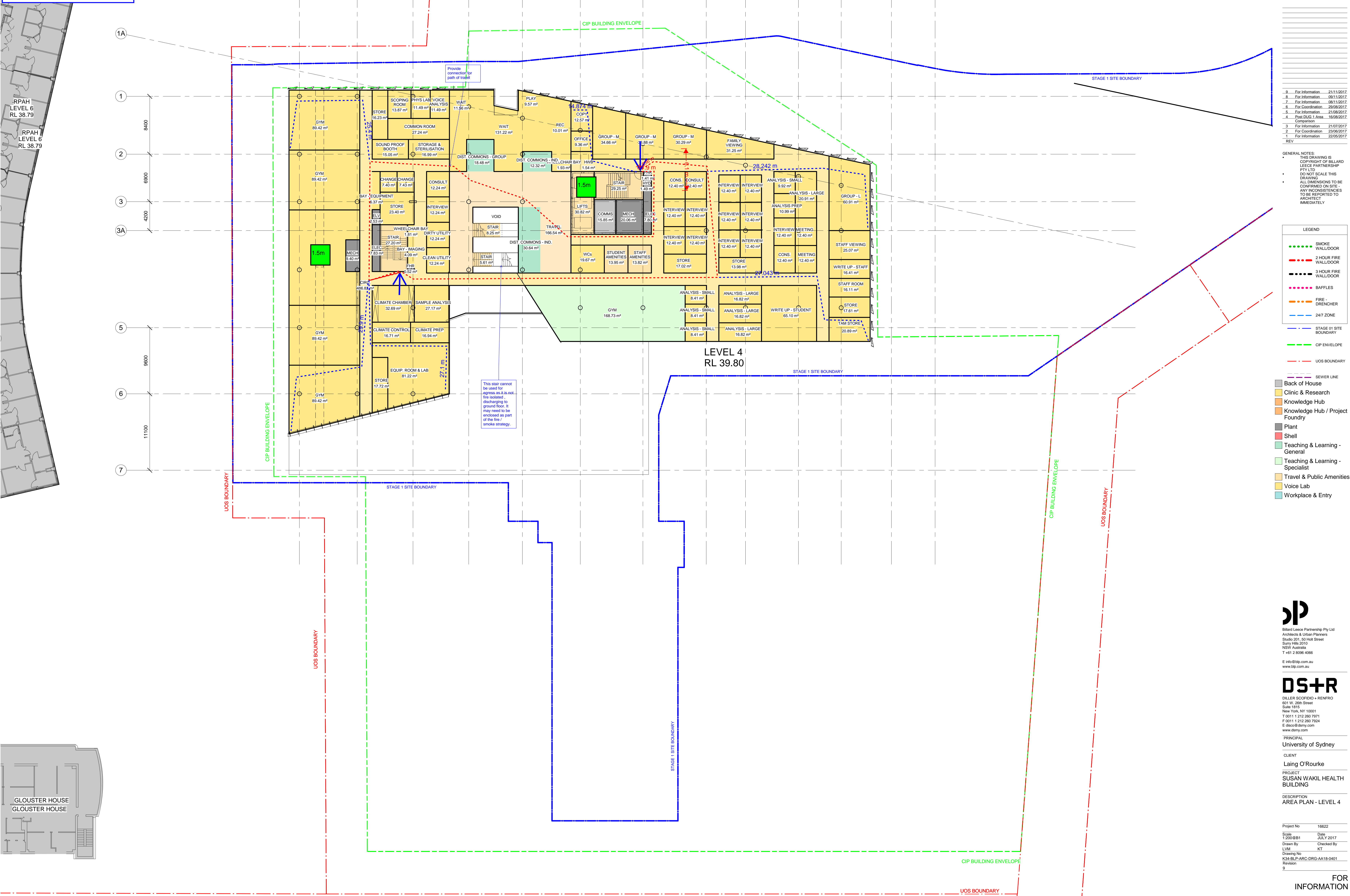
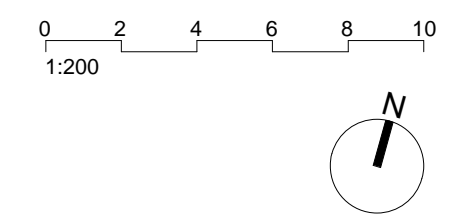
All stairs - Not more than 36 risers in consecutive flights are permitted without a change of direction - (Q2.13)

Temporarily available egress pathways needed.

This stair cannot be used for egress as it is not fire isolated, discharging to ground floor. It may need to be enclosed as part of the fire / smoke strategy.

Not more than 36 risers in consecutive flights without a change of direction - (Q2.13) applies to all stairs.

LEVEL 4 -
3m aggregate egress



REV	DESCRIPTION	DATE
9	For Information	21/11/2017
8	For Information	09/11/2017
7	For Information	08/11/2017
6	For Coordination	29/08/2017
5	For Information	23/08/2017
4	Post DUG 1 Area	16/08/2017
3	For Information	21/07/2017
2	For Coordination	23/06/2017
1	For Information	22/05/2017

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LEGEND	
	SMOKE WALLDOOR
	2 HOUR FIRE WALLDOOR
	3 HOUR FIRE WALLDOOR
	BAFFLES
	FIRE DRENCHER
	24/7 ZONE
	STAGE 01 SITE BOUNDARY
	CIP ENVELOPE
	UOS BOUNDARY

	Back of House
	Clinic & Research
	Knowledge Hub
	Knowledge Hub / Project Foundry
	Plant
	Shell
	Teaching & Learning - General
	Teaching & Learning - Specialist
	Travel & Public Amenities
	Voice Lab
	Workplace & Entry

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PROJECT
SUSAN WAKIL HEALTH BUILDING
DESCRIPTION
AREA PLAN - LEVEL 4

Project No	16622
Scale	1:200/BB1
Date	JULY 2017
Drawn By	LVM
Checked By	KT
Drawing No	K34-BLP-ARC-DRG-AA18-0401
Revision	9

FOR INFORMATION

**LEVEL 6 -
3m aggregate egress**



REV	DESCRIPTION	DATE
9	For Information	21/11/2017
8	For Information	09/11/2017
7	For Information	08/11/2017
6	For Coordination	29/08/2017
5	For Coordination	23/08/2017
4	Post-ENG 1 Area - 16/08/2017 Comparison	
3	For Information	21/07/2017
2	For Coordination	23/06/2017
1	For Information	22/05/2017

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LEGEND

- SMOKE WALL/DOOR
- 2 HOUR FIRE WALL/DOOR
- 3 HOUR FIRE WALL/DOOR
- BAFFLES
- FIRE DRENCHER
- 24/7 ZONE
- STAGE 01 SITE BOUNDARY
- CIP ENVELOPE
- UOS BOUNDARY
- SEWER LINE

- Back of House
- Clinic & Research
- Knowledge Hub
- Knowledge Hub / Project Foundry
- Plant
- Shell
- Teaching & Learning - General
- Teaching & Learning - Specialist
- Travel & Public Amenities
- Voice Lab
- Workplace & Entry

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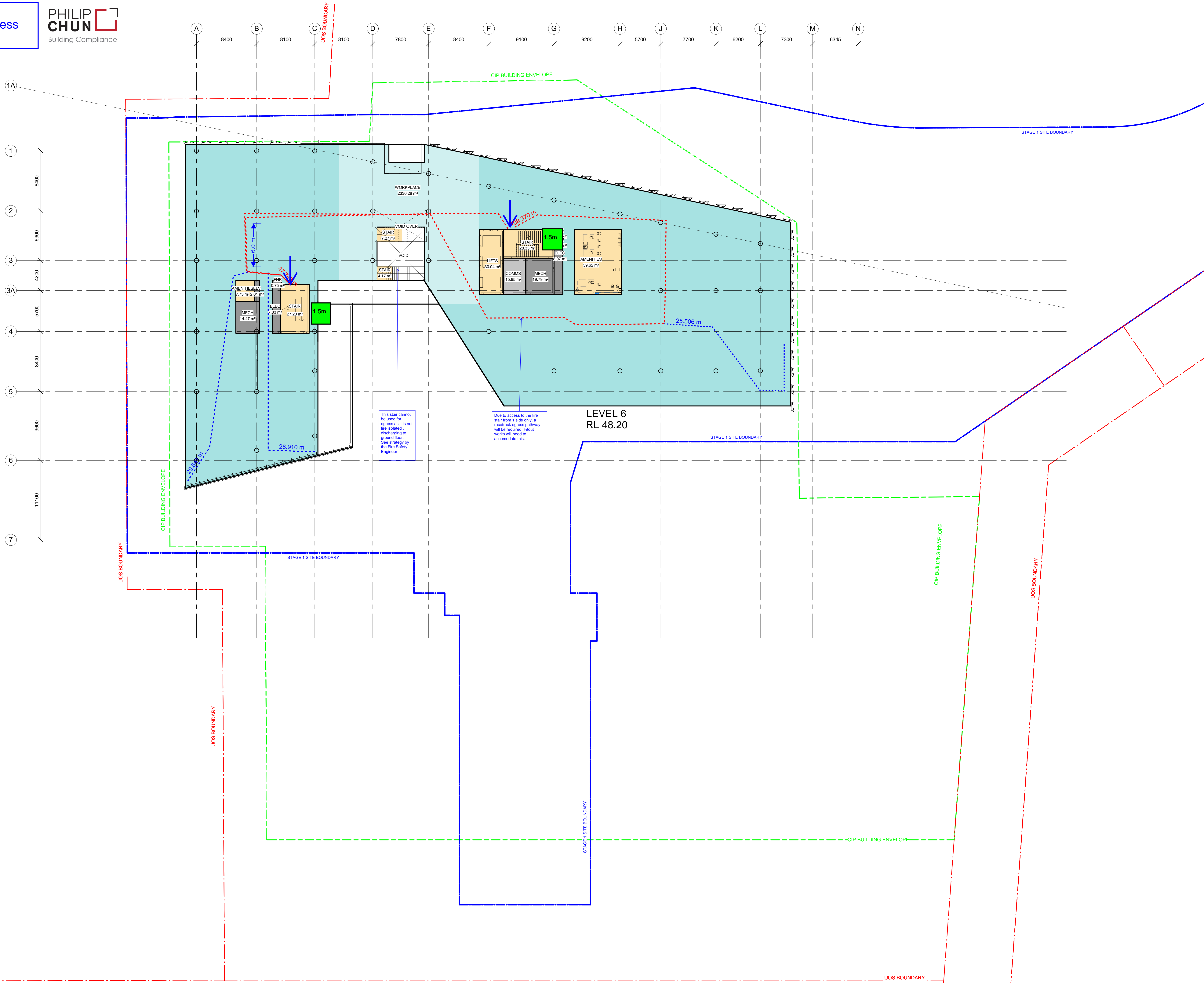
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PROJECT
SUSAN WAKIL HEALTH BUILDING

DESCRIPTION
AREA PLAN - LEVEL 6

Project No	16622
Scale	1:200/BB1
Date	JULY 2017
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Drawing No	K34-BLP-ARC-DRG-AA18-0601
Revision	9

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RPAH LEVEL 8
RL 47.18

RPAH LEVEL 8
RL 47.18

**LEVEL 7 -
3m aggregate egress**



REV	DESCRIPTION	DATE
9	For Information	21/11/2017
8	For Information	09/11/2017
7	For Information	08/11/2017
6	For Coordination	29/08/2017
5	For Coordination	23/08/2017
4	Post-DWG 1 Area - 16/08/2017 Comparison	
3	For Information	21/07/2017
2	For Coordination	23/06/2017
1	For Information	22/05/2017

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ARCHITECT
IMMEDIATELY

LEGEND	
	SMOKE WALL/DOOR
	2 HOUR FIRE WALL/DOOR
	3 HOUR FIRE WALL/DOOR
	BAFFLES
	FIRE DRENCHER
	24/7 ZONE
	STAGE 1 SITE BOUNDARY
	CIP ENVELOPE
	UOS BOUNDARY

	Back of House
	Clinic & Research
	Knowledge Hub
	Knowledge Hub / Project Foundry
	Plant
	Shell
	Teaching & Learning - General
	Teaching & Learning - Specialist
	Travel & Public Amenities
	Voice Lab
	Workplace & Entry

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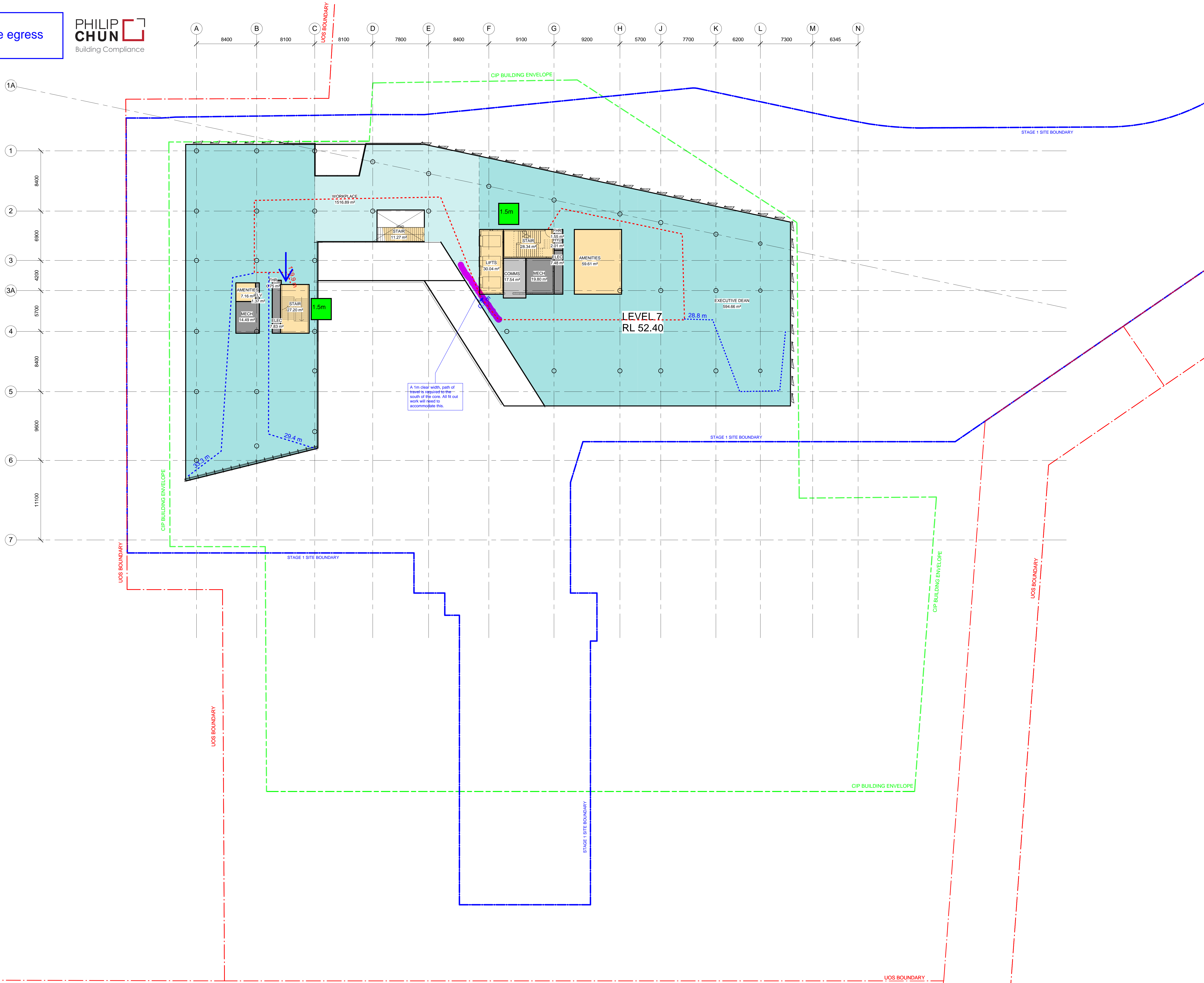
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PROJECT
SUSAN WAKIL HEALTH BUILDING

DESCRIPTION
AREA PLAN - LEVEL 7

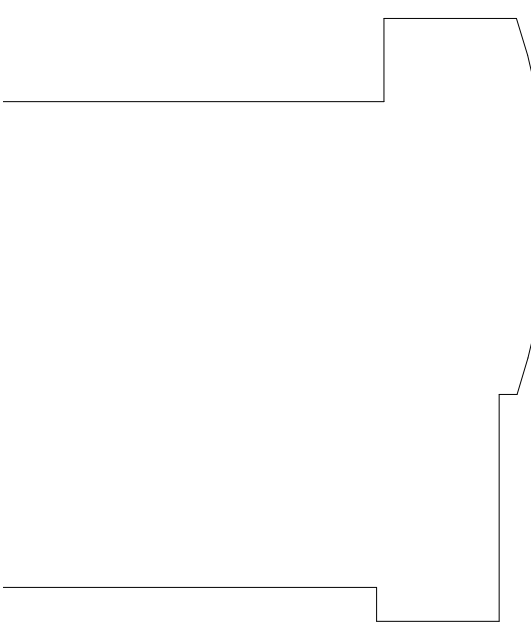
Project No	16622
Scale	1:200/BB1
Date	JULY 2017
Drawn By	LVM
Checked By	KT
Drawing No	K34-BLP-ARC-DRG-AA18-0701
Revision	9

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RPAH LEVEL 9
RL 51.37

RPAH LEVEL 9
RL 51.37



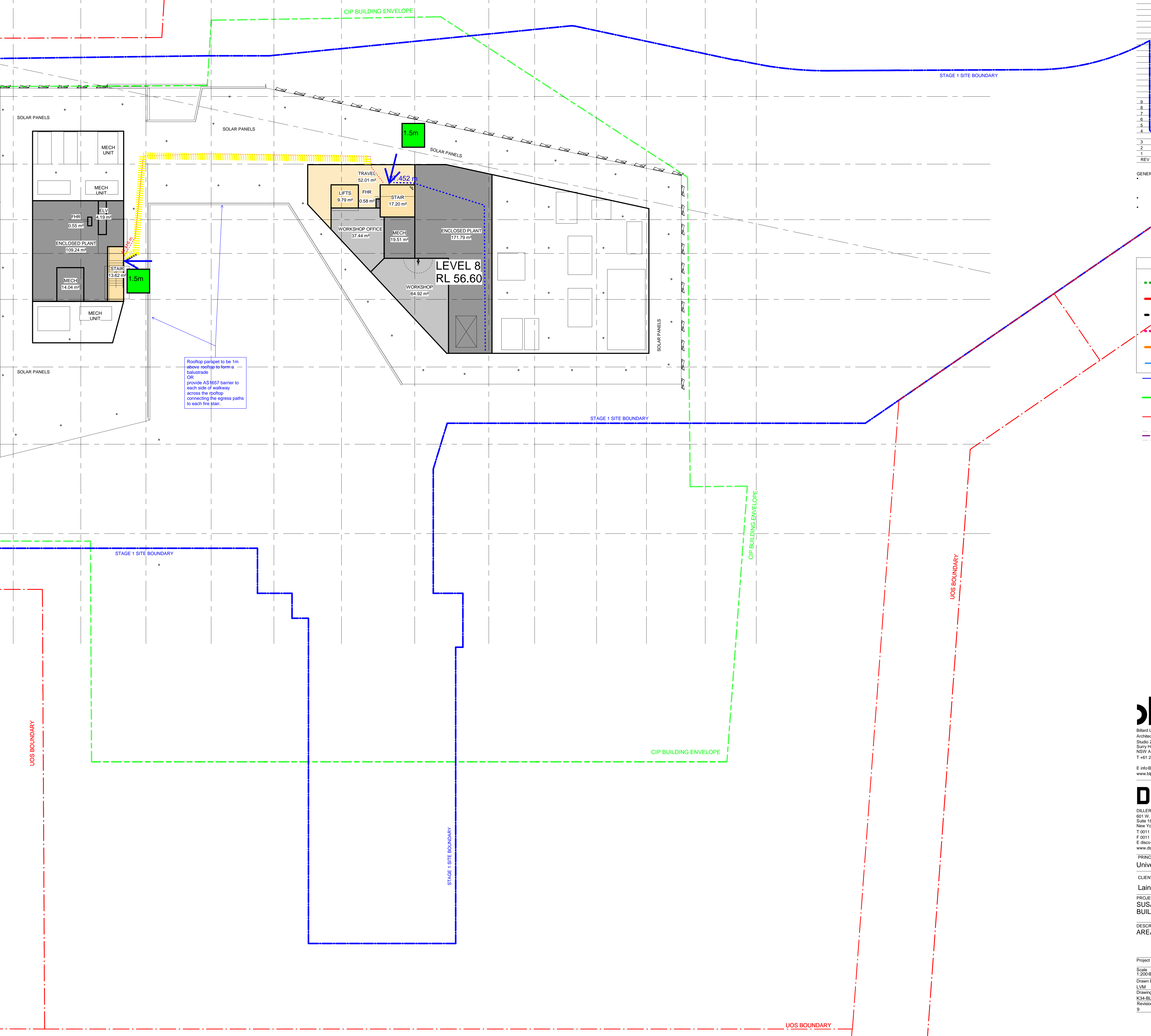
**LEVEL 8 -
3m aggregate egress**

**PHILIP
CHUN**
Building Compliance

A 8400 B 8100 C 8100 D 7800 E 8400 F 9100 G 9200 H 5700 J 7700 K 13500 M 6345 N

0 2 4 6 8 10
1:200

1A
1
2
3
3A
4
5
6
7



Rooftop parapet to be 1m above rooftop to form a balustrade OR provide AS1657 barrier to each side of walkway across the rooftop connecting the egress paths to each fire stair.

REV	DESCRIPTION	DATE
9	For Information	21/11/2017
8	For Information	09/11/2017
7	For Information	08/11/2017
6	For Coordination	29/08/2017
5	For Coordination	23/08/2017
4	For Coordination	16/08/2017
3	For Information	21/07/2017
2	For Coordination	23/06/2017
1	For Information	22/05/2017

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LEGEND

- SMOKE WALLDOOR
- 2 HOUR FIRE WALLDOOR
- 3 HOUR FIRE WALLDOOR
- BAFFLES
- FIRE DRENCHER
- 24/7 ZONE
- STAGE 1 SITE BOUNDARY
- CIP ENVELOPE
- UOS BOUNDARY

- Back of House
- Clinic & Research
- Knowledge Hub
- Knowledge Hub / Project Foundry
- Plant
- Shell
- Teaching & Learning - General
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PROJECT
SUSAN WAKIL HEALTH BUILDING

DESCRIPTION
AREA PLAN - LEVEL 8

Project No	16622
Scale	1:200/BB1
Date	JULY 2017
Drawn By	LVM
Checked By	KT
Drawing No	K34-BLP-ARC-DRG-AA18-0801
Revision	9

FOR INFORMATION
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