



FIRE SAFETY STRATEGY

Project: Melrose Park High School	Ref No.: F202441_FSS_03
Address: 37 Hope Street, Melrose Park, NSW 2114	Date: January 2025
	Issue: Updated Issue

To: Emma Murray, NSW Department of Education

RE: Fire Safety Strategy – Updated Issue

1. INTRODUCTION

1.1 OVERVIEW

This Fire Safety Strategy has been prepared by CORE Engineering Group on behalf of the Department of Education (DoE) to assess the potential life safety, fire spread and fire brigade intervention impacts that could arise from the construction and use of the new Melrose Park High School project (the Activity) at 37 Hope Street, Melrose Park. This report supports the assessment of the proposed Activity under Part 5 of the Environmental Planning and Assessment Act 1979. The Activity is proposed by the DoE to meet the growth in educational demand in the Melrose Park precinct.

1.2 SCOPE

The purpose of this report is to document the proposed fire safety strategy for the building, including guidance on the likely fire engineering trial design which has been established based on review of the proposed design, input from the BCA consultant, and CORE Engineering Group's previous experience. This document is intended to be a guidance document for the design team to inform detailed design documentation and shall be further developed as necessary through ongoing consultation.

The specific details included are:

- The proposed Performance Solutions to address identified non-compliances.
- The proposed fire engineering requirements.

1.3 SOURCES OF INFORMATION

- Architectural set provided by NBRS Architects.
- BCA compliance report (report # SYD224_171-2_ReturnBrief JR, Rev 2, dated 22/09/24) and associated BCA review drawing mark-up dated 23/09/2024, provided by DC Partnership.

1.4 LIMITATIONS AND ASSUMPTIONS

- This document represents the opinions of CORE Engineering Group based on the information known at the time of preparation of this document. Opinions, findings, and recommendations detailed in this document are based on our understanding and interpretation of current statutory and regulatory obligations and standards and should not be construed as legal opinions.
- This report does not constitute a fire engineering report (FER) that addresses the Performance Requirements of the BCA. Any recommendations herein are subject to detailed fire engineering analysis, and the relevant approval process.
- This document has been prepared as a guidance document only, and any parties relying on this should be cognisant that the recommendations are preliminary and subject to detailed analysis and authority approvals.

2. PROPOSED WORKS

2.1 SITE CONTEXT

The site is located at 37 Hope Street, Melrose Park within the Parramatta LGA. The school covers an approximate area of 9,500 m² and is generally rectangular in shape. The site is currently cleared and vacant. The site is located approximately 8km east of the Parramatta CBD. The site shall be accessed from Wharf Road (and the proposed Wharf Road Reserve, refer to Figure A-9) and Hope Street from the east and south, respectively. The site is otherwise bounded by adjacent lots which are indicated to accommodate future roads and communal playing fields.

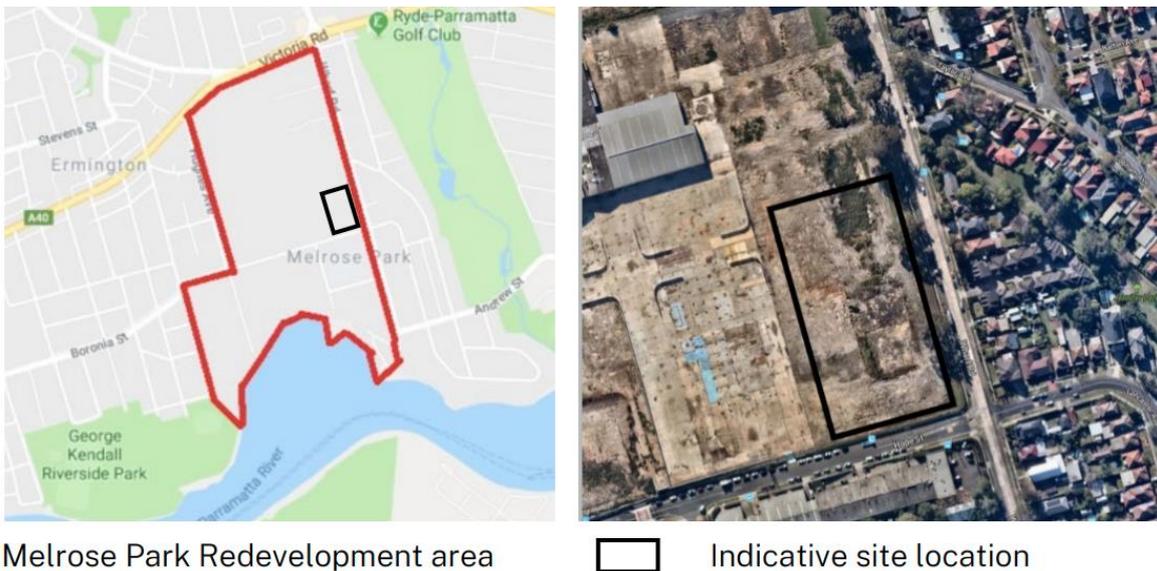


Figure 2-1: Extract from Project Brief

2.2 BUILDING DESCRIPTION

The proposed activity involves the construction and use of a new high school in two stages for approximately 1,000 students.

Stage 1 of the proposed activity includes the following:

- Site preparation works.
- Construction of Block A – a six-storey (with additional roof/plant level) school building in the south-western portion of the site containing staff rooms and General Learning Spaces (GLS).
- Construction of Block B – a one storey (double height) hall, gymnasium, canteen and covered outdoor learning area (COLA) building in the south-eastern portion of the site.
- Construction of Block C – a single storey plant and storage building at the north-eastern portion of the site.
- Associated landscaping.
- Construction of on-site car parking.
- Provision and augmentation of services infrastructure.
- Associated public domain infrastructure works to support the school, including (but not limited to):
- Provision of kiss and drop facilities along Wharf Road, and widening of the Wharf Road footpath.
- Raised pedestrian crossings on Wharf Road and Hope Street.

Stage 2 of the proposed activity includes the following:

- Construction of Block D – a five-storey (with additional roof/plant level) school building in the north-western portion of the site containing staff rooms and GLS:
- Additional open play spaces within the terrace areas of Building D.
- Minor layout amendments to Block A.

The Review of Environmental Factors prepared by Ethos Urban provides a full description of the proposed works.

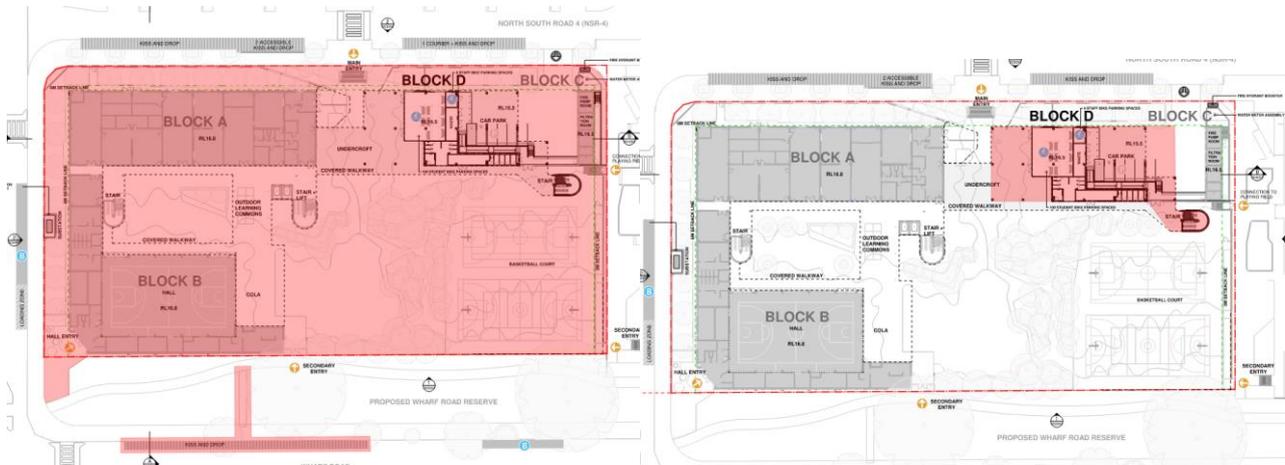


Figure 2-2: Proposed Staging Strategy



Figure 2-3: Street view context

2.3 BUILDING BCA CHARACTERISTICS

The following BCA characteristics are assumed for the building.

Table 2-1: Building BCA Characteristics

CHARACTERISTIC	DEVELOPMENT SITE
Classification	Class 9b (secondary school & hall), Class 5 (ancillary office spaces)
Rise in Storeys	Six (6)

CHARACTERISTIC	DEVELOPMENT SITE
Type of Construction	Type A
Effective height	18.75 m

2.4 POTENTIAL FIRE HAZARDS WITHIN THE DEVELOPMENT

2.4.1 EV Chargers to Undercroft Car Park

It is likely that the carpark will include provision for the presence and charging of electric vehicles. The fire hazard posed by electric vehicles is a developing area of study and can present unique challenges to firefighters. Although not a Performance Solution, the following measures are recommended to be adopted in the design to facilitate fire brigade intervention and reduce the impact on building occupants. These measures are to be agreed by the design team to enable compliance with DtS Provisions E1D17 and E2D21 to the satisfaction of the PCA as applicable, noting that in this case the EV Chargers shall be proposed located within the open-air on-grade carpark.

- The carpark shall be provided with hydrant coverage in accordance with AS2419.1:2021.
- Electric vehicle charging stations shall be located no less than 10 m from hydrants and 6 m from stair exits.
- Where charging stations are installed, these locations are to be nominated on a block plan, to be provided at all FDCIE.
- Measures recommended under the ABCB's Advisory Notice 'Electric Vehicles in Buildings' should be implemented as appropriate.

It should also be noted that FRNSW's Position Statement entitled "*Electric Vehicles (EV) and EV Charging Equipment*" outlines that they endorse the guideline provided by AFAC, and that they recommend that sprinkler protection is provided in instances where EV parking is located internal to a building (i.e. within the building footprint). Consideration should be provided by the design team in this regard, noting that the building is not proposed to be sprinkler-protected.

2.4.2 Photovoltaic Panels

Solar panels are indicatively proposed to be installed on the roof of the building. The panels shall be installed in compliance with Standards Australia guideline AS/NZS 5033: Installation and safety requirements for photovoltaic (PV) arrays 2012.

A schematic diagram of the system must be provided at all FDCIE. This diagram must:

- Provide notice of the type of alternative electrical generation system, and its location.
- Have a heading that states "SOLAR PANEL (PV CELLS)" in 25 mm red text with a contrasting-coloured background.
- Indicate the location of all equipment associated with the solar panels.

Further, any isolation switches shall be provided on or adjacent to the Main FIP.

2.4.3 Chemical Storage

Detail surrounding the handling and storage of Dangerous Goods associated with science labs and workshops is to be reviewed to determine if additional measures are required to mitigate the risk of their presence.

2.4.4 Substation

Substations shall be located along the southern perimeter of the site along Hope Street and shall therefore be provided with a minimum 10 m separation from the hydrant booster (located in the north-western corner of the site) in accordance with AS2419.1:2021.

3. PROPOSED FIRE ENGINEERING TRIAL DESIGN REQUIREMENTS

The below summarises the proposed fire engineering requirements to satisfy the Performance Requirements of the NCC.

3.1 STRUCTURE AND COMPARTMENTATION

3.1.1 Structure

The building is required to achieve Type A construction. Class 9b areas should achieve a minimum of 120/120/120 FRL, inclusive of the roof as the building is not sprinkler-protected.

- A Performance Solution is proposed to address the roof of the school hall (and supporting structure), and connected walkway awnings and COLAs not achieving an FRL, on the basis of the fire separation proposed under Section 3.1.2 and the separation provided to the change rooms to separate Block A and the hall (Block B).

3.1.2 Compartmentation

Each storey is separated by virtue of the slab construction, in addition to the following to support the holistic fire strategy as discussed in Section 3.2.5:

- Ground Floor: A fire wall and roof (FRL of 120/120/120) to the change rooms shall separate the gymnasium / hall from the main school building (Block A) to achieve the separation requirements stipulated under Provision D2D13. Refer to Figure A-2.
- Other spaces located within 6 m of external stairs (i.e. bathroom cubicles, comms stores and workshop) shall also be provided with fire separation (refer to Figure A-2 and Figure A-3).

3.1.3 External Walls

All components of the external wall are to be non-combustible or as otherwise acceptable by DtS Provisions C2D10 and C2D14.

External walls are to achieve FRLs in accordance with Specification 5 of the NCC, noting that the external walls of the building are currently depicted as being greater than 3 m of the site boundary and therefore will require an FRL to loadbearing elements only (i.e. not non-loadbearing elements).

3.1.4 Spandrels

Spandrels are required in accordance with Provision C3D7 as sprinkler protection is not proposed.

3.1.5 Protection of Openings

The eastern perimeter of Block B is within 3 m of the eastern boundary (proposed wharf road reserve). However, it is understood that no openings are currently proposed within this wall, such that protection of openings under Provision C4D3 is not applicable.

3.2 EGRESS

3.2.1 Number of Exits

The building is served by three main stairs in the locations depicted in Figure A-1.

A Performance Solution is proposed to address the hall's canteen and canteen office only being served by a single exit. This shall be reliant on the single exit being direct to outside, the small footprint of the rooms and the expectation that occupants are likely to be staff members who are familiar with the provision of exits, as well as drawing equivalence to concessions available under NSW D2D3(4) for the canteen being single-storey noting that the hall is fire-separated from the other blocks on site to consider the hall in isolation for the purposes of egress.

3.2.2 Travel Distances

As a result of the floorplate layout, the following travel distances are expected to be addressed under a Performance Solution throughout the building (refer to Figure A-3 and Figure A-4):

- Up to 25 m to a point of choice.
- Up to 50 m to the nearest exit.
- Up to 65 m between alternative exits.

The strategy for the Performance Solution largely relies upon the layout of the 'group learning spaces', whereby an effective point of choice is provided within 20 m, the external stairs being located in opposite directions along balconies, with portions of these stairs that are greater than 6 m from the building façade being available with a separation of less than 60 m.

3.2.3 Discharge of Exits

Exits to the courtyard require occupants to pass back beneath the building or covered walkways/COLAs to reach open space. This is proposed to be addressed as a Performance Solution (refer to Figure A-2), reliant on the stairs discharging in a position greater than 6 m from the building, and on the basis that no permanent fire load is present beneath the walkways and COLAs.

Further, external gates are present in the discharge path. Should these not automatically unlock on fire trip, a Performance Solution may be feasible to address this, based on exits being available in alternative directions away from the external gates and the sporting fields not being covered.

- The school's emergency evacuation procedures may constitute part of the justification for this item – the intent and strategy will need to be further reviewed by CORE and the wider design team. Safe holding areas will need to be able to accommodate the (majority of) the school's population.

3.2.4 Direction of Door Swings

Doors to learning spaces on Ground Level swing against the direction of travel (refer to Figure A-2). However, this is no different to the same doors on more elevated storeys where these doors are instead treated as doors in path of travel to an exit. A Performance Solution is therefore proposed, reliant on the consistent approach to door swings throughout the building.

- Consideration should be provided to replacing roller doors in the path of travel to an exit with swing doors, particularly relevant to the 'materials store' and 'project store' rooms serving the wood and metal workshops on Ground Floor. Should this not be achievable, CORE may review the feasibility of a Performance Solution.

3.2.5 External Stairs

Exits are generally proposed to be constructed as external stairs in accordance with Provision D2D13. Discharge of these stairs must comply with Provision D2D15 as well as the requirements outlined in Section 3.2.3 (being that pathways are available which do not require travel back within 6 m of the building façade, with exception to covered walkways/COLAs that are not expected to involve permanent fire loads).

Further, the southern stair is located within 6 m of the changing rooms serving the hall as well as the workshop and thus 120/120/120 fire separation is provided to walls and the roof as outlined in Section 3.1.2 and Figure A-2 to protect occupants egressing via this external stair. Other spaces located within 6 m of external stairs (i.e. bathroom cubicles and comms stores) shall also be provided with fire separation (refer to Figure A-2 and Figure A-3).

3.3 FIRE FIGHTING EQUIPMENT

3.3.1 Fire Hydrants

The site is proposed to be served by a fire hydrant system in accordance with NCC Provision E1D2 and AS2419.1:2021. The design proposes to utilise a booster and internal hydrants to achieve coverage of the building.

- A Performance Solution is proposed to assess the location of the hydrant booster which is not located within sight of the principal pedestrian entry which is located along the same street (the future internal western road) as the hydrant booster.
- The hydrant booster is proposed to be located within 10 m from the external façade of the building (being Block C), and as such the external facade of the building shall be fire-rated (FRL of 90/90/90 as depicted in Figure A-2) to fulfill the radiant heat shielding requirement of AS2419.1:2021.
- The booster shall be located greater than 10 m from any substations or external combustible storage.
- Additional internal hydrants are required to achieve hydrant coverage which is not prescriptively permitted under AS2419.1:2021. A Performance Solution shall address this, reliant on these additional hydrants being located within cupboards along the open balcony (i.e. not within rooms and enclosures).

The following additional guidance is provided:

- All hose connections in the system are to be fitted in accordance with FRNSW Technical information sheet – FRNSW compatible hose connections (available at firesafety.fire.nsw.gov.au). These couplings should be tested as part of the system when the commissioning tests are undertaken.

3.3.2 Fire Hose Reels

Fire hose reels are prescriptively required to serve the building in areas that are not classrooms and associated corridors, in accordance with DtS Provision E1D3.

- A Performance Solution is proposed to omit hose reels from ancillary use areas (e.g. plant rooms, store rooms, etc) and staff-only areas (e.g. admin block and the like). This shall be reliant on the provision of portable fire extinguishers as the primary means of extinguishment within these areas (minimum of one per enclosure where hose reels are omitted).

3.3.3 Fire Sprinkler System

A fire sprinkler system is not required to serve the building under the DtS Provisions.

- Should the installation of a sprinkler system be considered, there will be a number of benefits and efficiencies that can be introduced to the fire strategy for the building (such as the deletion of spandrels, omission of radiant heat shields to hydrants, and greater flexibility around permissible extended travel distance).

3.3.4 Portable Fire Extinguishers

Portable fire extinguishers are to be provided throughout the building in accordance with DtS Provision E1D14 of the BCA and selected, located, and distributed in accordance with AS2444:2001.

- Where areas identified under Section 3.3.2 are to omit fire hose reels, a minimum of one portable fire extinguisher shall be provided per enclosure.

3.3.5 Control and Indicating Equipment

The location of the FDCIE for the building is proposed as follows:

- Fire Control Centre (FCC) shall be located within the public reception, being the main entrance as accessed off the future internal western road.
- Networked FDCIE is proposed to be located within the hall entry, located at the corner of Wharf Road and Hope Street. This panel shall afford flexibility in an after-hours scenario where the hall is utilised for a function but the school is not open. Sufficient clearances in accordance with AS1670.1:2018 are to be provided to demonstrate suitability of the selected location.
 - The distribution of FDCIE (and specifically the panel serving the hall) shall be reviewed during detailed design with respect to the potential for compliance, and shall be subject to consultation with FRNSW.

3.4 SMOKE HAZARD MANAGEMENT

3.4.1 Smoke Detection System

A smoke detection system is proposed to be provided throughout the building in accordance with Provisions E2D16, Specification 20 and AS1670.1:2018, noting that the building is less than 25 m in effective height.

3.4.2 Smoke Exhaust

The hall is considered to be connected to the main building by virtue of the COLAs and walkway awnings, and thus the floor area exceeds 2000 m².

However, the BCA consultant has advised that smoke exhaust is not a prescriptive requirement for the school hall as it does not include a stage, and that "*its primary design and operational focus is on sports and school-related activities, such as assemblies and classes. Given this, it is our interpretation that exemptions under clauses 2(a) and 2(c) of Provision NSW E2D19 can be pursued*".

On this basis, the hall is not prescriptively required to be provided with an automatic smoke exhaust system.

3.4.3 Emergency Warning and Intercom System

An Emergency Warning and Intercom System (EWIS) is to be provided throughout all parts of the development. The system should be in accordance with the prescriptive requirements of Provision E4D9 and AS1670.4:2018. Coordination of WIP locations is to be reviewed.

3.4.4 System Monitoring

Alarm signalling equipment should be provided that sends notification to fire brigade on fire alarm.

3.5 VISIBILITY IN AN EMERGENCY, EXIT SIGNS AND WARNING SYSTEMS

Emergency lighting and exit signage is to be provided throughout the building in accordance with DtS Provisions E4D2 and E4D4 and AS2293.1:2018, noting that the design is expected to provide exit signage above each of the doorways leading from the GLS to the external walkways.

3.6 BUILDING AND CONSTRUCTION MANAGEMENT PROCEDURES

The ongoing management of the building is as important in maintaining a high level of life safety as the provisions recommended during the design phase of the building.

- As outlined in Section 3.2.3, the school's emergency management procedures may be relied upon to justify any Performance Solution relating to perimeter gates being locked during a fire emergency.

3.6.1 Maintenance of Fire Safety Equipment

The fire safety systems should be tested and maintained in accordance with Australian Standard AS1851.

4. PROPOSED PERFORMANCE SOLUTIONS

4.1 SUMMARY

DtS non-conformances have been identified as part of these works. In particular, the fire safety assessment and fire engineering analysis shall be focused on the following identified Performance Solutions.

Table 4-1: Summary of potential Performance Solutions

#	DTS PROVISION	TITLE	NON-COMPLIANCE(S)	PROPOSED SOLUTION	PERFORMANCE
1	C2D2 Spec 5	Rationalised fire resistance levels	<ul style="list-style-type: none"> School hall roof and supporting structure (and COLA awning) to be constructed as lightweight (no FRL). 	<ul style="list-style-type: none"> A fire wall and roof (FRL of 120/120/120) to the change rooms shall separate the hall from the main school building (Block A). Smoke detection throughout building, including hall roof. COLA assumed as not containing any permanent fire load. ~16 m separation from school hall and Block A on Ground Floor (including walkways of non-combustible construction). 	
2	D2D3	Number of exits	<ul style="list-style-type: none"> Canteen and canteen office are provided with a single exit in lieu of two. 	<ul style="list-style-type: none"> COLA assumed as not containing any permanent fire load. Direct egress provided to outside. Main occupants will likely be trained occupants who are familiar with location of exits. 	
3	D2D5 D2D6	Extended travel distances	<ul style="list-style-type: none"> Up to 25 m to a point of choice. Up to 50 m to nearest exit. Up to 65 m between alternative exits. 	<ul style="list-style-type: none"> Effective point of choice prior to 20 m, allowing occupants alternative pathway (e.g. via sliding doors between GLS) Alternative pathways to reach nearest exit within 60 m along open balcony Distance between exits when measuring to point greater than 6 m from façade (rather than top riser) within 60 m. Exit signage positioned at each doorway to the open balcony walkways. 	
4	D2D15	Discharge to open space	<ul style="list-style-type: none"> Exits to the courtyard require occupants to pass back beneath the building or walkways/COLAs to reach open space. 	<ul style="list-style-type: none"> No permanent fire load beneath COLAs and covered walkways. Alternative paths separated from the various 'blocks' by a distance greater than 6 m. Smoke detection and alarm system provided throughout the building. 	

#	DTS PROVISION	TITLE	NON-COMPLIANCE(S)	PROPOSED SOLUTION	PERFORMANCE
5	D3D25	Door swings	<ul style="list-style-type: none"> Doors to learning spaces on Lower Ground swing in the direction opposite to the path of travel. 	<ul style="list-style-type: none"> Doorway swings are consistent throughout the school. Multiple doorways to reach open space on Ground Floor to reduce potential for queueing. 	
6	E1D2	Additional internal fire hydrants	<ul style="list-style-type: none"> Additional internal fire hydrants are required for coverage. 	<ul style="list-style-type: none"> Additional hydrants are to be positioned along the open balcony walkways and not in enclosed spaces/rooms. 	
7	E1D2	Fire hydrant booster location	<ul style="list-style-type: none"> Location not within sight of the main building entry. 	<ul style="list-style-type: none"> Location consistent with the intent of AS2419.1:2021. Protected by heat shield to a minimum standard of that prescribed in AS2419.1:2021, as located within 10 m from Block C. 	
8	E1D3	Fire hose reels	<ul style="list-style-type: none"> Omission of fire hose reels from ancillary use areas (e.g. plant rooms, store rooms, etc) and staff only areas (e.g. admin block, etc.) 	<ul style="list-style-type: none"> Provision of additional portable fire extinguishers. Generally consistent approach through the building as DtS concession for school classrooms. DtS concession for Class 5 offices, similar to admin areas. 	

5. CONCLUSION

The fire safety strategy presented herein is considered capable of meeting the Performance Requirements of the BCA, subject to implementation of the recommendations/mitigation measures set out in Section 3 of this report; and validation and verification of any assumptions made through detailed fire engineering analysis.

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REVIEWED BY



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APPENDIX A FIRE STRATEGY MARKUPS

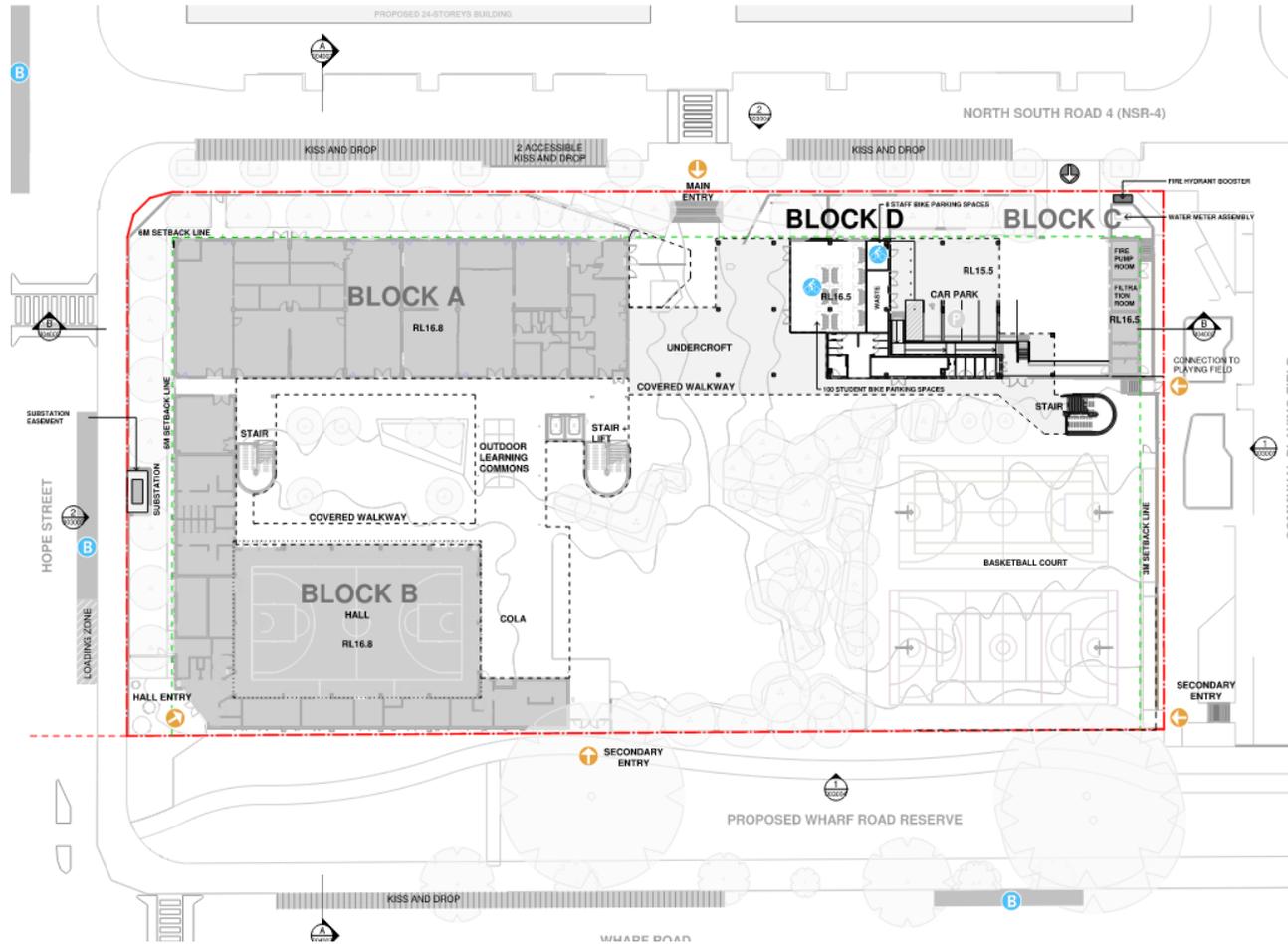


Figure A-1: Site Layout

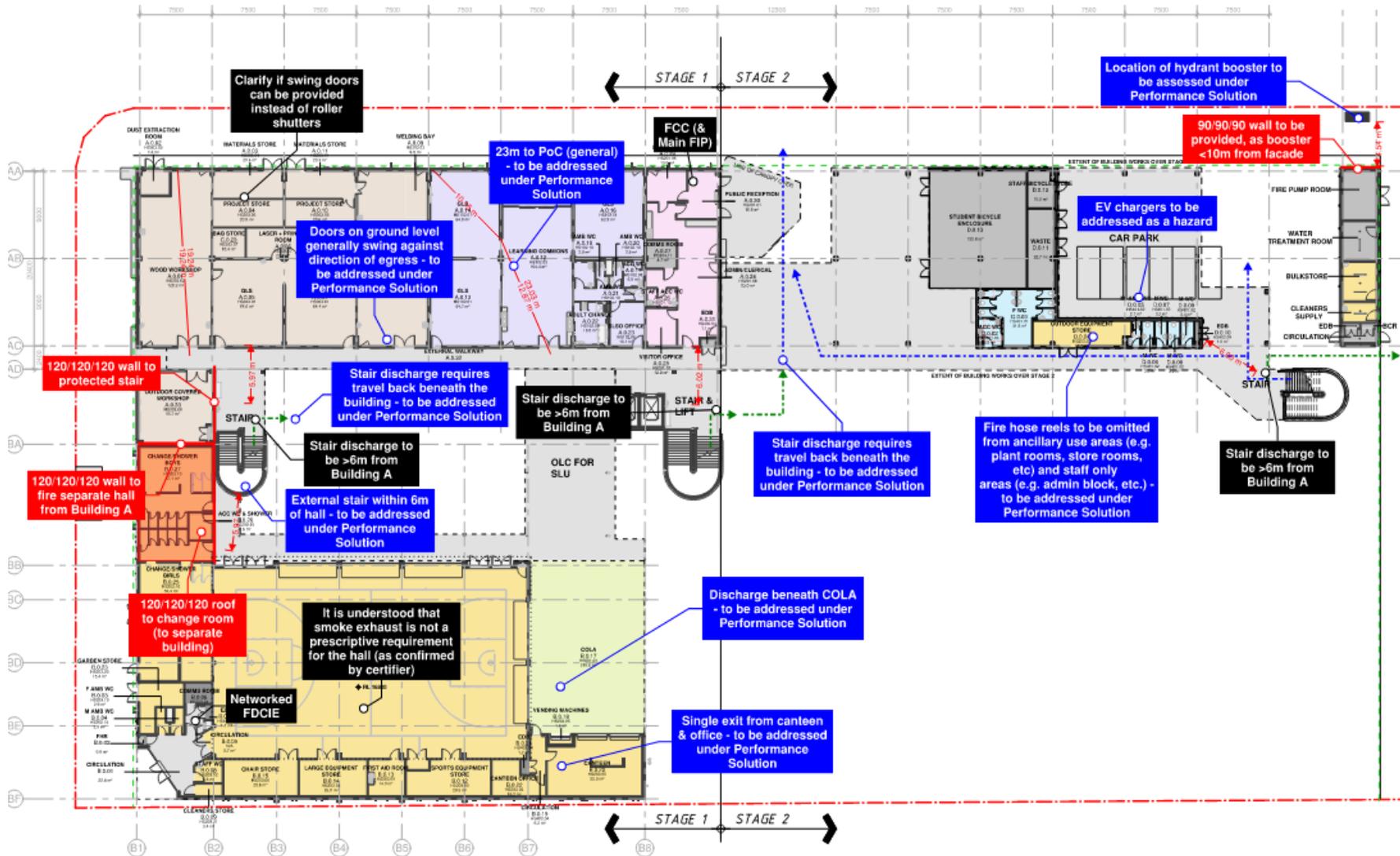


Figure A-2: Ground Level

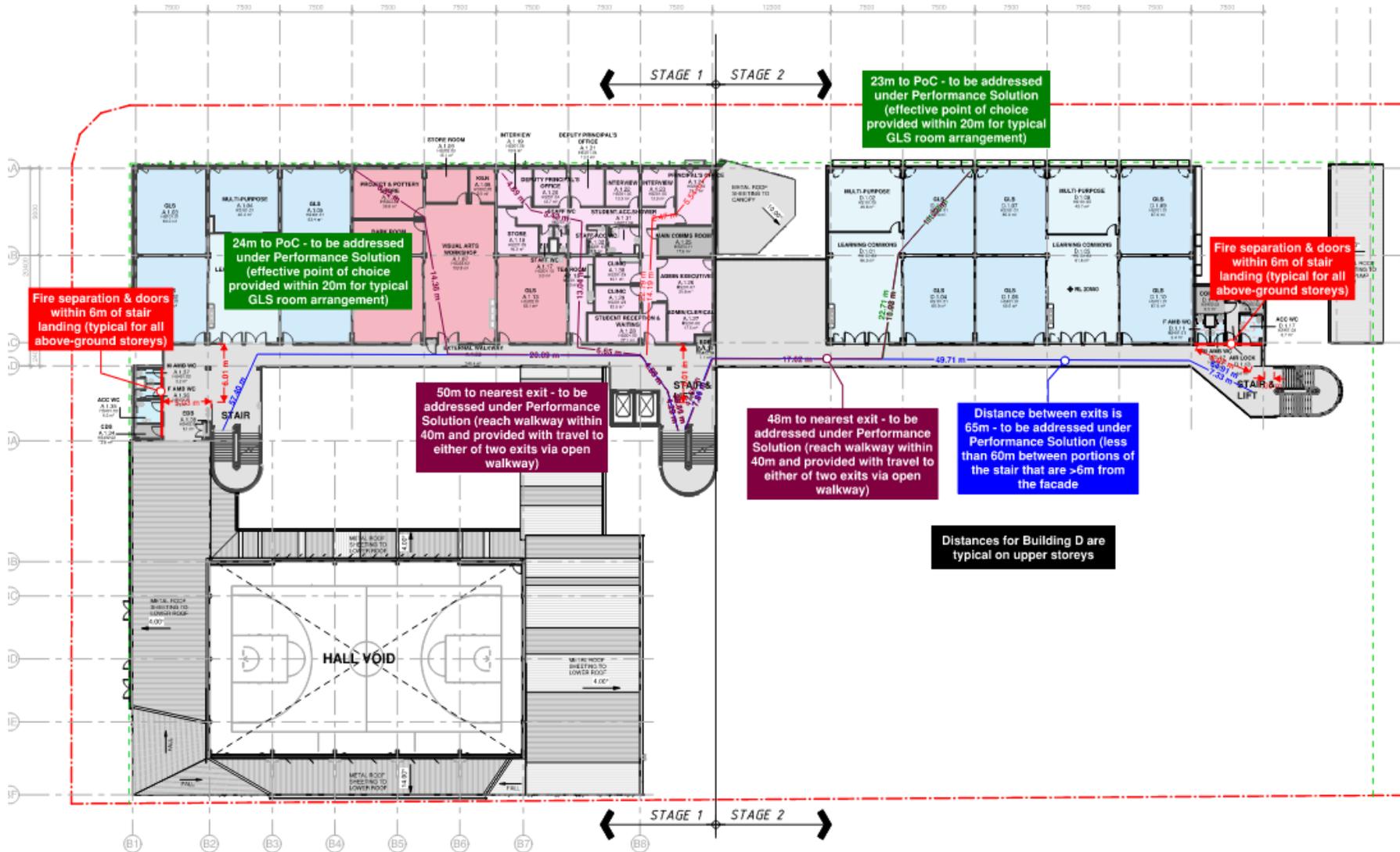


Figure A-3: Level 1

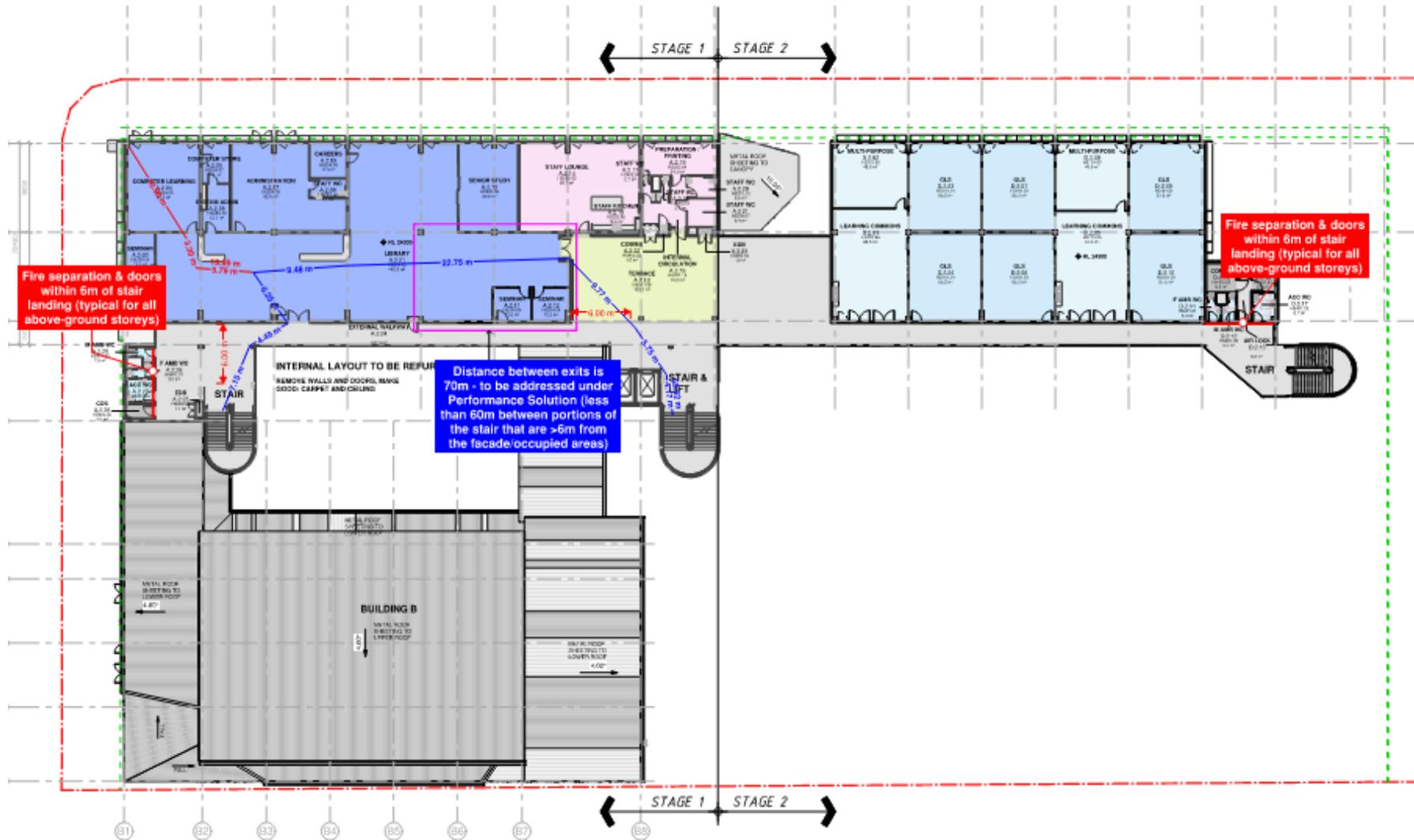


Figure A-4: Level 2

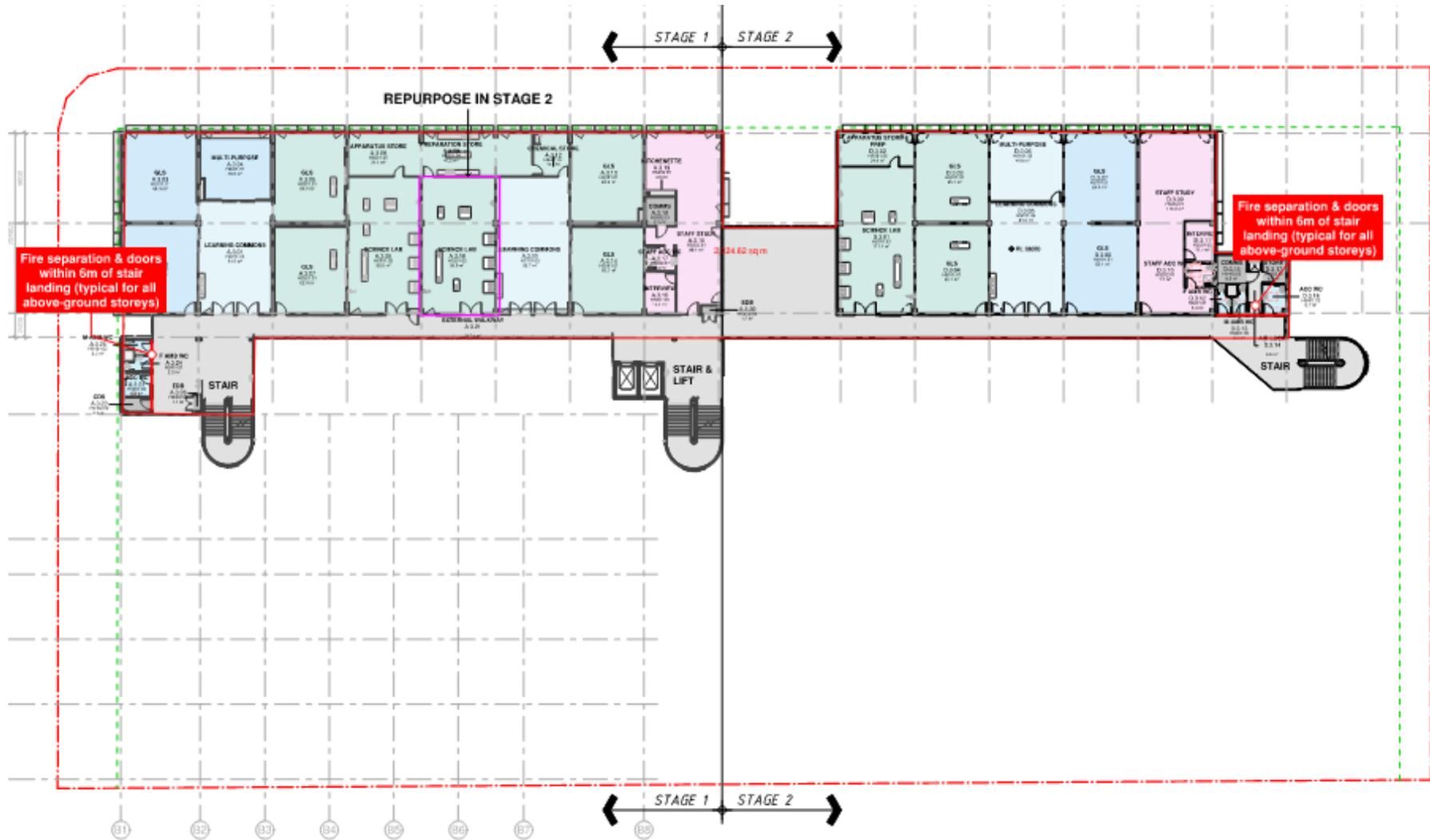


Figure A-5: Level 3



Figure A-6: Level 4

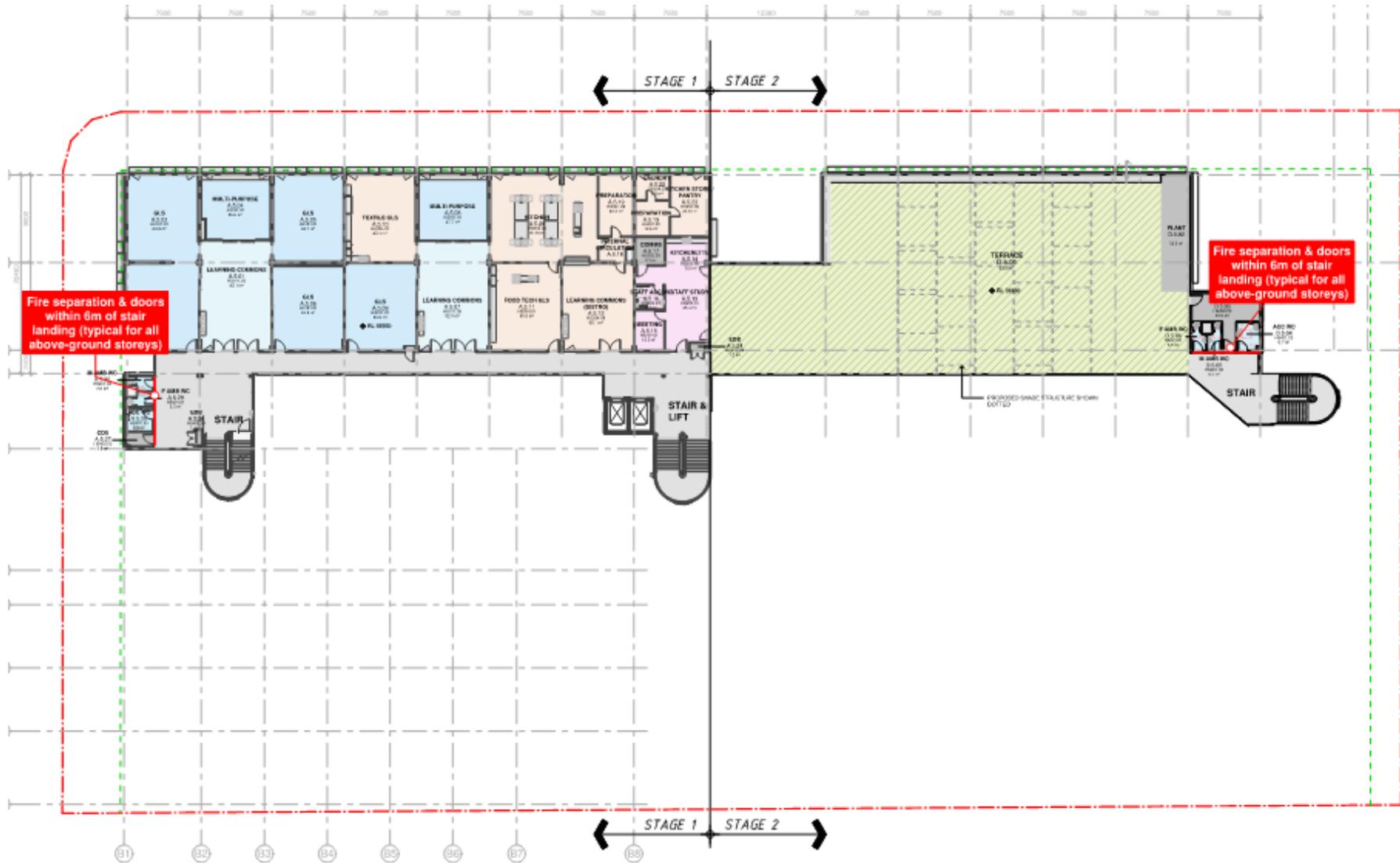


Figure A-7: Level 5

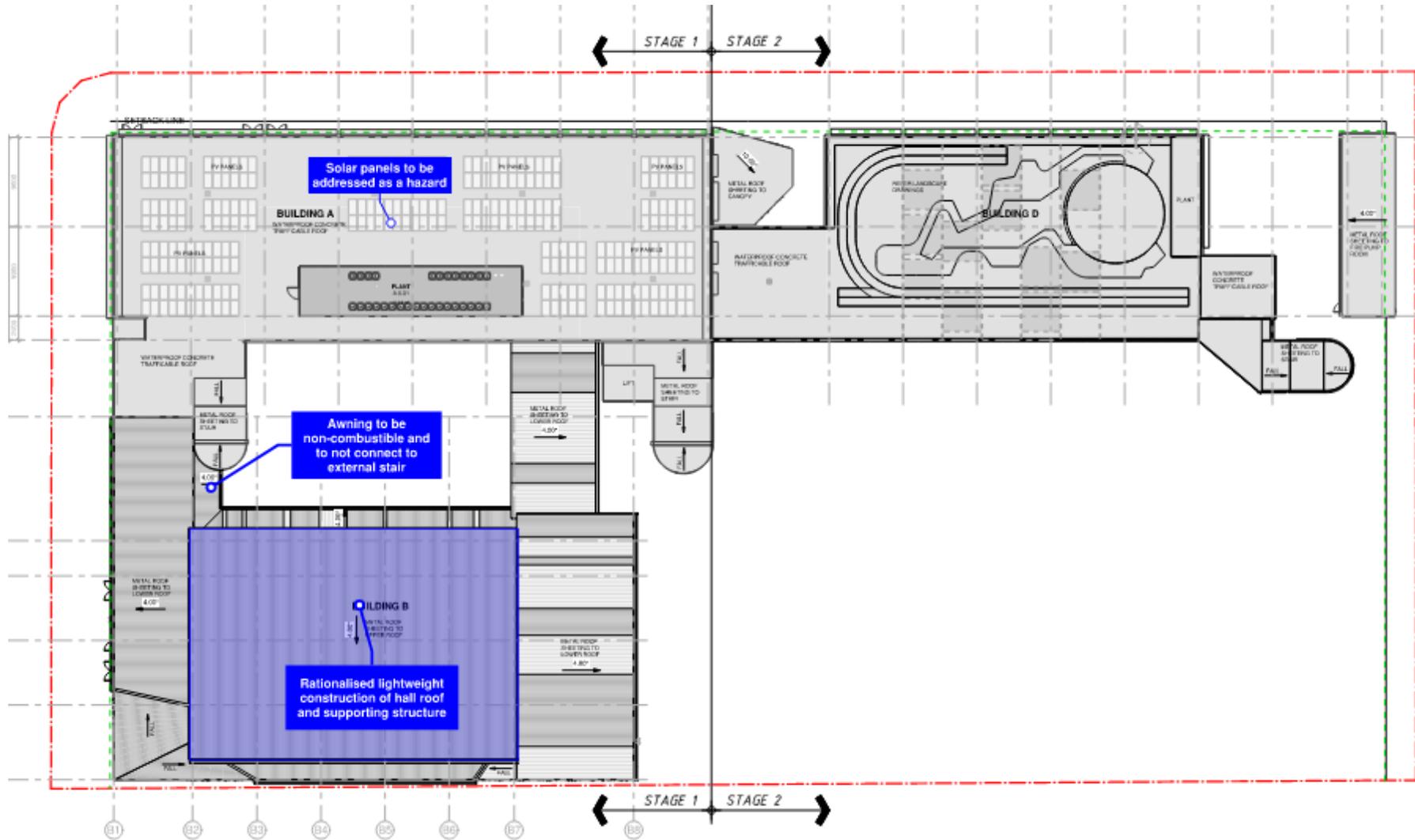


Figure A-8: Roof Plan



Figure A-9: SP2 School Zoning, and RE1 zoning for 'Wharf Road Reserve'