METRO BUILDING CONSULTANCY

CONCORD HIGH SCHOOL
New High School Building

BUILDING CODE OF AUSTRALIA 2022 & BCA ACCESS

100% SCHEMATIC DESIGN REVIEW

JUNE 2023

Report prepared for	Department of Education Level 25, Governor Phillip Tower 1 Farrer Place Sydney NSW 2000 Attention: Sherwin Rasquinha
Report prepared by	Metro Building Consultancy Suite 15.14, 60 Station Street, Parramatta NSW 2150 Consultant: Sean Moore
Report reference	22196-CHS-100% Schematic BCA & Access Report
Job number	22196
Date	02nd June 2023

METRO BUILDING CONSULTANCY

CONTENTS

DOCUMENT ACCEPTANCE

Company	Name	Signed	Date
Metro Building Consultancy	Sean Moore		02/06/2023

REVISION HISTORY

Description	Prepared by	Revision No.	Date
Initial BCA Report	Roland Allam	01	29/07/2022
Initial BCA Report – Rev 1	Roland Allam	02	05/08/2022
BCA Report – 70% Concept Design Drawings	Roland Allam	03	26/08/2022
BCA Report – 100% Concept Design Drawings	Roland Allam	04	06/10/2022
BCA Report – Draft Schematic Design Drawings	Alaa Al Qaseer	05	23/02/2023
BCA Report – 100% Schematic Design Drawings	Alaa Al Qaseer	05	19/04/2023
BCA Report – 100% Schematic Design Drawings	Sean Moore	06	02/06/2023

1.0 Introduction and Documentation

Introduction
School Infrastructure have requested a Building Code of Australia report in relation to the BCA & BCA Access compliance of the draft schematic design documents for the proposed High School building at Concord High School.

The information submitted to date has been reviewed for compliance with the Deemed-to-Satisfy provisions of the Building Code of Australia 2022 excluding Section B structure, NSW Part I4 entertainment venues and Section J energy efficiency. This report is for the exclusive use of the client and cannot be used for any other purpose without the prior permission of Metro Building Consultancy. The report is only valid in its entire form.

Documentation available and assessed
The drawings referenced in Appendix C have been assessed for compliance to the Building Code of Australia.

2.0 Use and class of building

The following table lists the uses and classifications of the proposed four storey Concord High School building.

Level	Use	Class	Approx. floor area
Ground Floor	Administrative offices, gym/basketball court, stage, classrooms and ancillary storerooms and canteen	Class 5 and 9b	Approx. 3757m^2
First Floor	Staff study and lounge, classrooms, learning workshops, and ancillary storerooms	Class 5 and 9b	Approx. 2234m^2
Second Floor	Classrooms, learning laboratory and ancillary storerooms.	Class 9b	Approx. 2200m^2
Third Floor	Classrooms and amenities.	Class 9b	Approx. 1682m^2

The new High School Building has a rise of storey of 4 and is required to comply with the Type A Construction requirements in Appendix A. The effective height of the building is less than 25m (approximately 13.27m, see diagram on page 34)

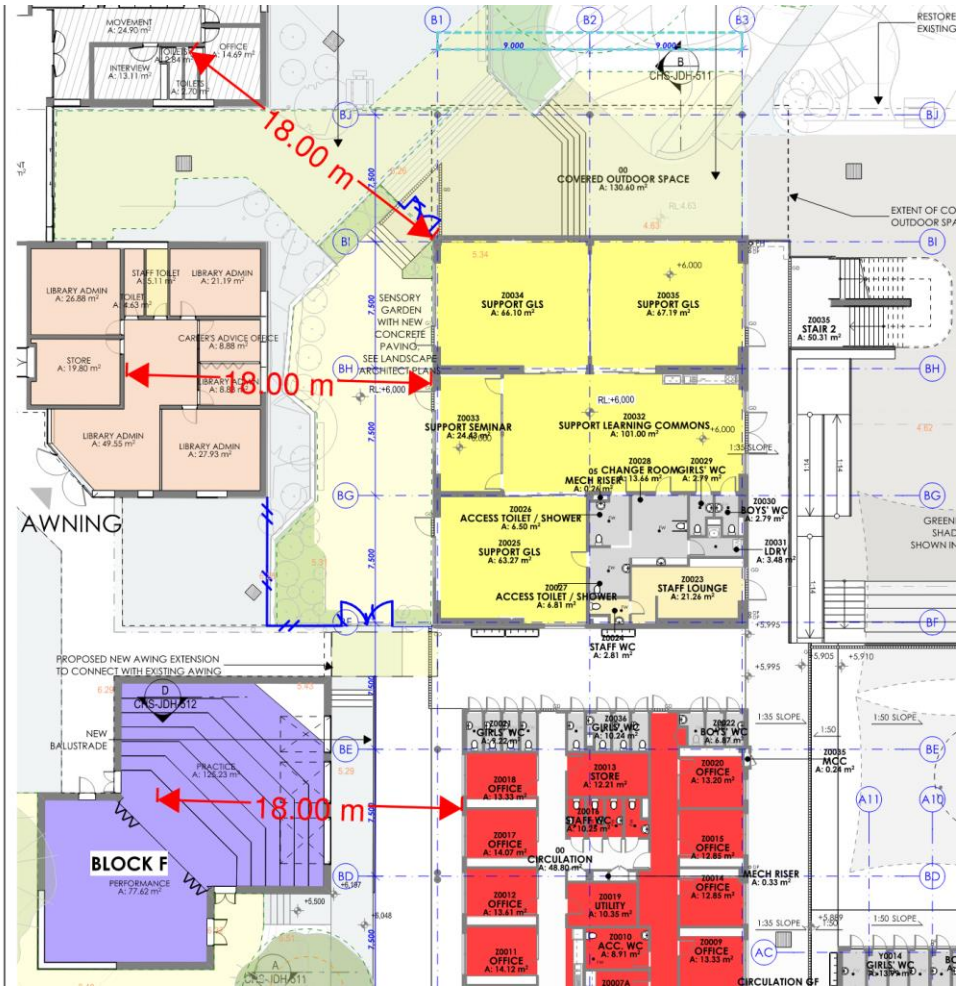
It is assumed that the joint use community hall will not be used as an entertainment venue which means a building used as a cinema, theatre or concert hall or an indoor sports stadium. If the community do use the hall as an entertainment venue then the significant requirements of BCA NSW Part I4 will apply to the design.

3.0 Construction and fire resistance ratings

Exposure of the proposed works to a fire source feature
The BCA sets out provisions for any part of a building element, which is exposed to a fire-source feature, if any of the horizontal straight lines between that part and the fire-source feature, or vertical projection of the feature need to be provided with the relevant FRL.

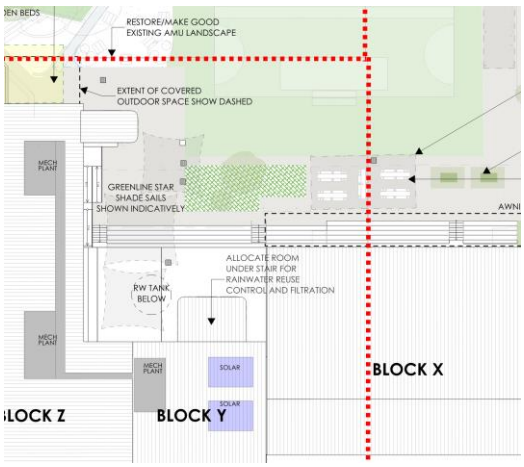
Fire-source feature means—
(a) the far boundary of a road, river, lake or the like adjoining the allotment; or
(b) a side or rear boundary of the allotment; or
(c) an external wall of another building on the allotment which is not a Class 10 building.

Where the external walls of the proposed new building are within 18m of the external loadbearing walls and columns of the existing buildings, and those existing buildings are 2 storey class 9b buildings (ie Type B Construction), the fire resistance level of the existing external loadbearing walls and columns are required to comply with the BCA Type B Construction requirements. Confirmation has been provided from the structural engineer that the existing structure in Building A, D & F complies with the new exposure created by the proposed works.



The non loadbearing parts of the existing buildings that are more than 3m from the proposed building do not require an FRL.

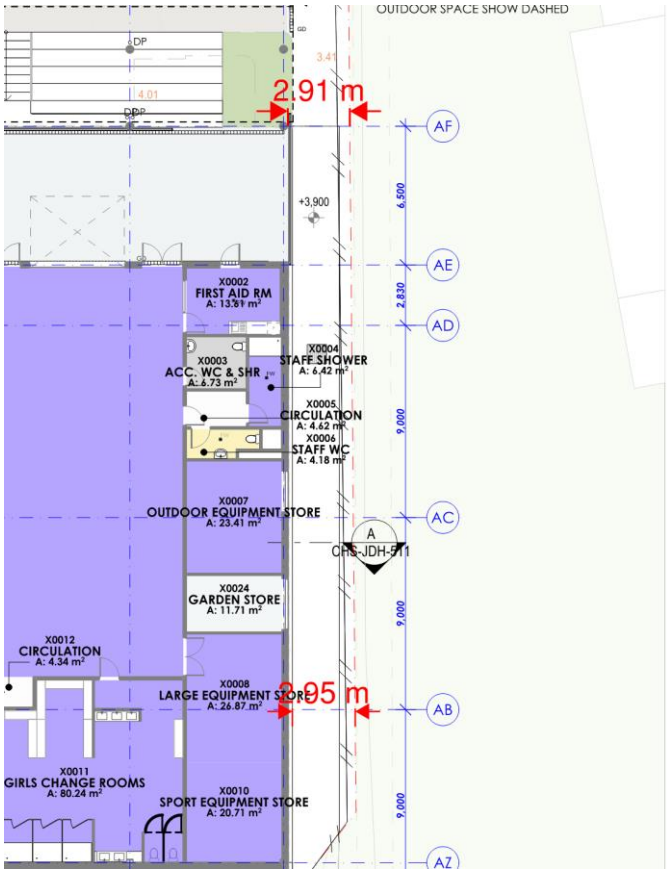
Any external walls of the proposed building that are exposed to any existing internal boundary line (which are treated as a fire source feature ie side boundary by the BCA) are required to comply with BCA Specification 5 Type A fire rating requirements. This exposure is proposed to be addressed in a fire engineering performance solution.



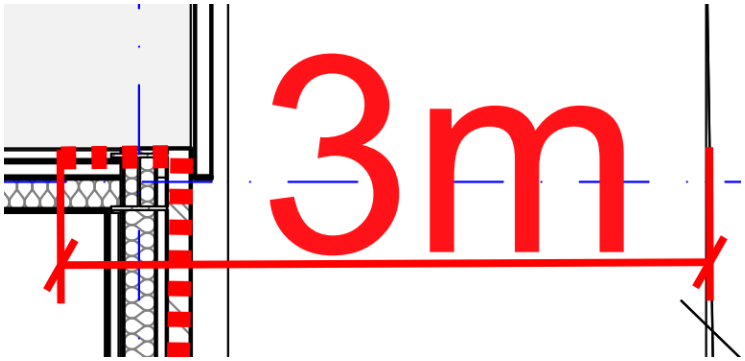
The external walls of the proposed building are exposed to the existing side boundary line which is treated as a fire source feature (ie side boundary) by the BCA. The definition of fire source feature does not give any exemptions for lots adjacent to parks. This exposure is proposed to be addressed in a fire engineering performance solution.

The load bearing parts of the external wall (including any column and other building element incorporated within it) for the class 5 and 9b areas of the new high school building require an FRL of not less than:
a) 120/90/90 where the external walls are located between 1.5m and 3m from the fire source feature.
b) 120/60/30 where the external walls are located 3m or more from a fire source feature.

The non-load bearing parts of the external wall for the class 5 and 9b areas of the new high school building require an FRL of not less than:
a) -/90/90 where the external walls are located between 1.5m and 3m from the fire source feature.
b) No FRL is required where the external walls are located 3m or more from a fire source feature.

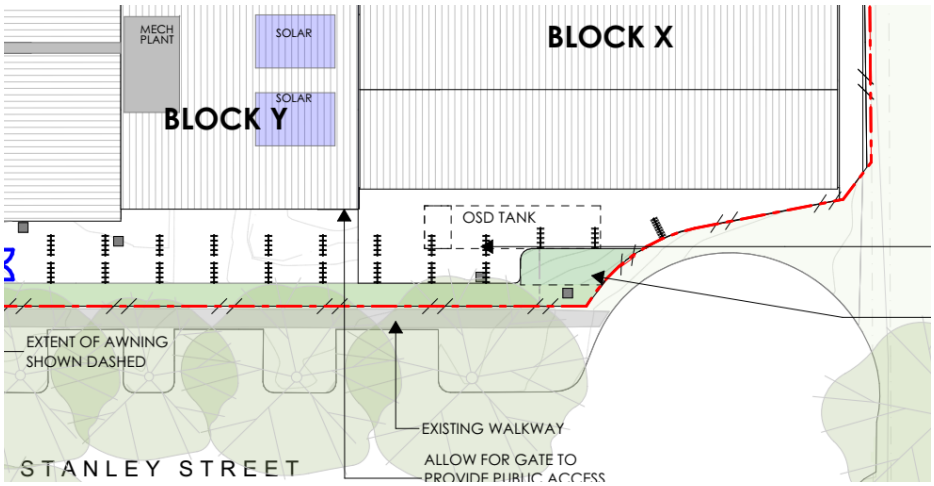


Please note that the 3m setback for the non loadbearing external walls extends along the face of the first aid room.

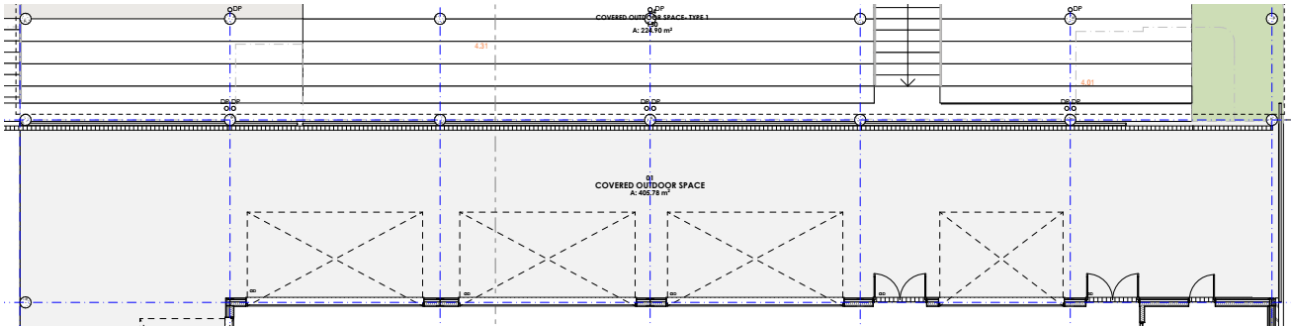


Please note that where the fire source feature changes from the side boundary to the far boundary of the road (Stanley Street) has to be confirmed. Refer to the BCA definition below.

Fire-source feature means—
(a) the far boundary of a road, river, lake or the like adjoining the allotment; or
(b) a side or rear boundary of the allotment; or
(c) an external wall of another building on the allotment which is not a Class 10 building.



The external loadbearing columns proposed to the new building are required to have an FRL of 120/-/- i.e. they cannot be non fire rated steel. Provide confirmation that the external columns supporting the roof over the covered outdoor space achieves an FRL of not less than 120/--/--.

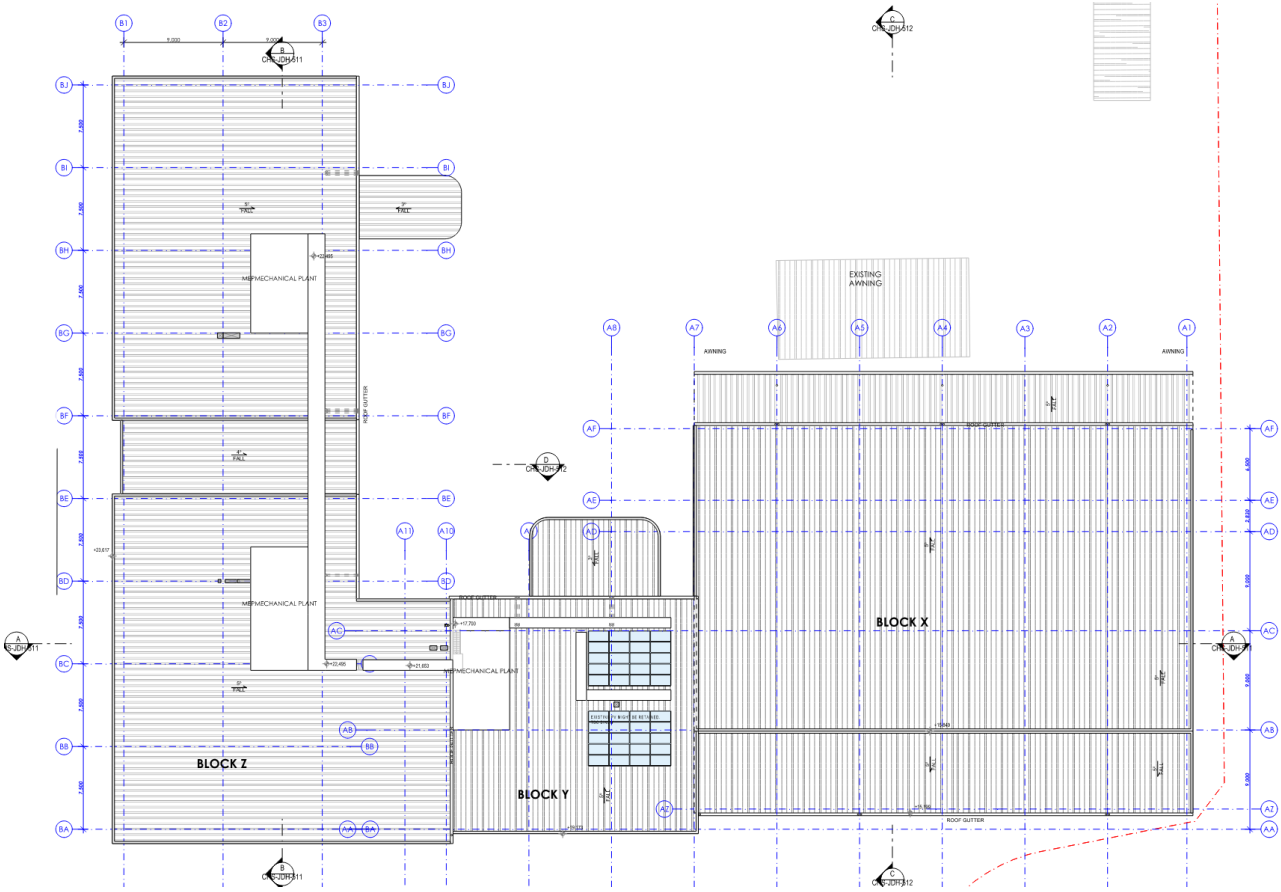


Fire protection for a support of another part
Where the BCA requires a building element to have a fire resistance level any other building element that provides direct vertical or lateral support is also required to be provided with the fire resistance level.

Enclosure of shafts
Shafts required to have an FRL must be enclosed at the top and bottom by construction having an FRL not less than that required for the walls of a non-loadbearing shaft in the same building, except that these provisions need not apply to—
(a) the top of a shaft extending beyond the roof covering, other than one enclosing a fire-isolated stairway or ramp; or
(b) the bottom of a shaft if it is non-combustible and laid directly on the ground.

This applies to the proposed fire-isolated stair shaft at grid A11/BA, the lift shaft and any services shafts.

Type A Construction – Roof
The roof is required to have an FRL of not less than 120/60/30, this includes the roof above Level 1, the roof above Level 3 and the roof over the stairs.



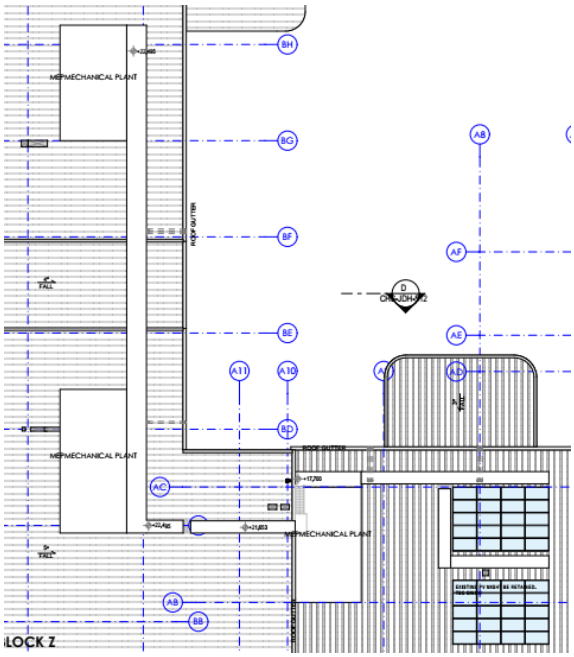
Concessions apply for a roof to not have a fire rating if its roof covering is non-combustible and the ceiling immediately below the roof is required to have a resistance to the incipient spread of fire to the roof space of not less than 60 minutes.

As a concrete roof is not specified the developed design drawings are required to include details of the 60 minute ceiling or its requirement is required to be addressed in a fire engineering report.

Please note the requirements above that where the BCA requires a building element to have a fire resistance level any other building element that provides direct vertical or lateral support is also required to be provided with the fire resistance level. This does not apply to the 60 minute ceiling option as it is not a fire resistance level.

A non-combustible structure situated on a roof need not have a fire rated roof if it only contains—
(i) lift motor equipment; or
(ii) one or more of the following:
(A) Hot water or other water tanks.
(B) Ventilating ductwork, ventilating fans and their motors.
(C) Air-conditioning chillers.
(D) Window cleaning equipment.
(E) Other service units that are non-combustible and do not contain flammable or combustible liquids or gases.

If the mechanical plant structure on the roof has its own roof the entire structure is required to be non-combustible or the roof over the plant enclosure is required to comply with the requirements above i.e. a fire rated roof or a 60 minute ceiling.



Type A Construction – Floors
The floors of the new high school building are required to have an FRL of not less than 120/120/120.

Floors are not required to have an FRL if they are laid directly on the ground.

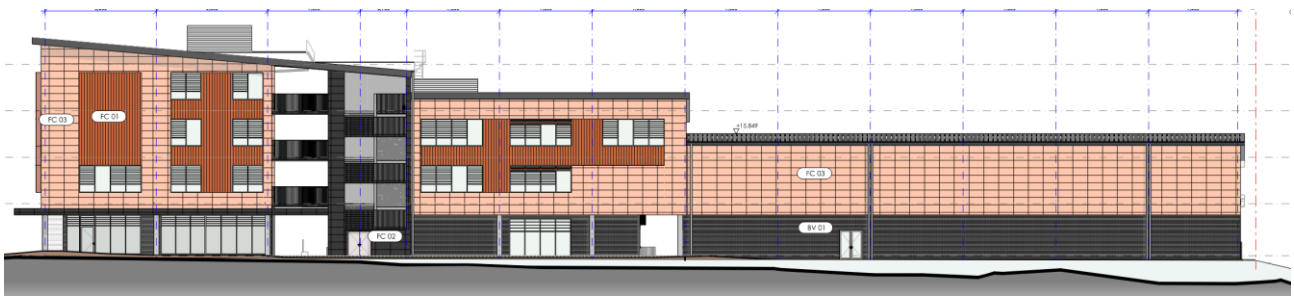
Type A Construction – Columns
The FRL of the internal columns and walls immediately below the roof of the proposed building may be reduced to achieve an FRL of 60/60/60. The concession only applies if the roof of the building does not have an FRL due to its roof covering being non-combustible and the ceiling immediately below the roof is required to have a resistance to the incipient spread of fire to the roof space of not less than 60 minutes

Lightweight Construction
Lightweight construction is required to comply with the requirements of BCA clause C2D9 and Specification 6.

Non-Combustible Building Elements
External walls and all components incorporated within them including façade covering, framing and insulation are required to be non-combustible.

Specifications and codemark certificates of the proposed materials making up the external walls of the proposed building are to be provided to confirm they are non-combustible.

The external mesh and louvres like enclosures to the north, south and west elevation will need to be non-combustible. Furthermore, the wall cladding on the Elevations is required to be non-combustible. Provide details in the next design stage for review.



Fire Hazard Properties

All new floor, wall and ceiling linings are to comply with the requirements of Clause C2D11 and Specification 7 of Building Code of Australia.

Fire Test Reports for all wall, floor and ceiling lining to be provided to confirm compliance prior to the completion of the design eg the timber wall panels and the sports flooring.

WPT1	Perforated Acoustic Timber Panel Internal / Gym	Perforated acoustic timber panels lin accordance with acoustic engineer's specification. Perforation and open area percentage to be confirmed by manufacturer. Allow for glasswool insulation and Black soundmesh backing. Fire Group 1 (TBC BCA) Size and design TBC during DD.
FPP	Pulastic Floor / Basketball Court, Movement Studio	Pulastic 2000 high-impact, indoor, cushioned Polyurethane Sports flooring on concrete. Installation as per manufacturer's specification.

It is noted that on previous SINSW projects that the ESFG specified floor make up to gyms includes the provision of a plywood substrate under the hardwood floor and that the manufacturers / supplies have been unable to provide a fire hazard indices test report that includes the ESFG specified floor make up. For these other projects this design element has been addressed in a fire engineered performance solution. It has been confirmed that the timber floor to the stage will be designed to comply with the BCA DTS requirements and that a fire engineered performance solution will not be sought.

TIM1	Timber Sprung Floor / Stage	Timber Sprung Floor, Resilient Product to meet EFSG requirements., including moisture barrier, substructure, and flooring. Allow for sport finishing and coating system. Slip rating: P2 Setdown required for product to be coordinated with the structural stage floor. Subject to BCA/ Fire engineering approvals. Product to be selected and approved accordingly.

Non-Combustible Ancillary Elements

An ancillary element must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible unless it is one of the following:
(a) An ancillary element that is non-combustible.
(b) A gutter, downpipe or other plumbing fixture or fitting.
(c) A flashing.
(d) A grate or grille not more than 2 m2 in area associated with a building service.
(e) An electrical switch, socket-outlet, cover plate or the like.
(f) A light fitting.
(g) A required sign

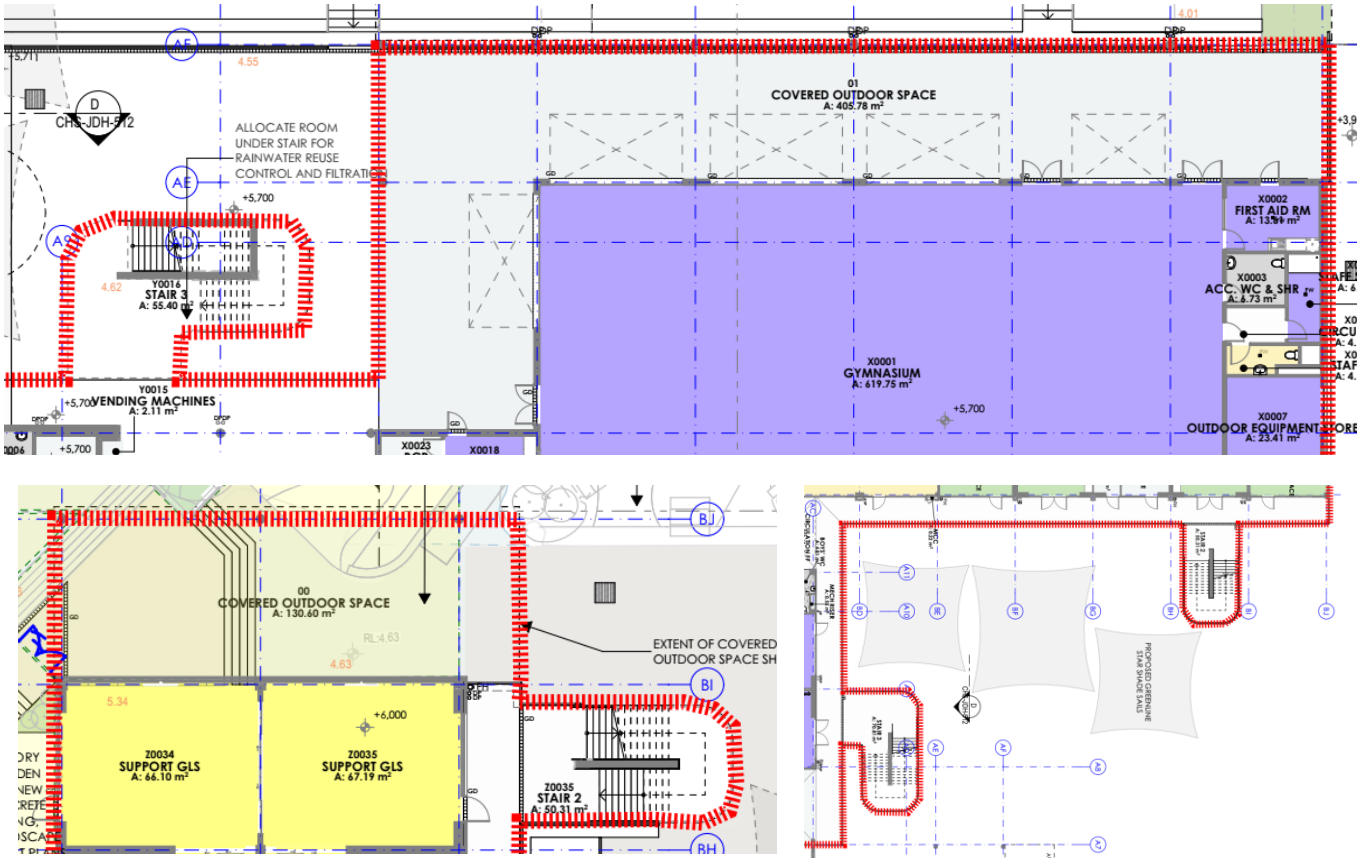
Specifications, test reports and codemark certificates of the ancillary element proposed to be fixed, installed or attached to the internal parts or external face of the external walls of the proposed building are to be provided to confirm they are non-combustible or are one of the concessions listed above.

Compartmentation

The Building Code of Australia requirement for class 5 & 9b buildings is that the maximum floor area of the fire compartment must not exceed 8000m^2 and the maximum volume must not exceed 48,000m^3.

The combined floor area of these three floors is approximately 8,191m2 (GF 3757m2, L1 2234m2, L2 2200m2) which is more than the maximum limit of 8,000m2. This is to be reassessed as the design is developed so that the floor area calculation can exclude areas where there is no bounding construction that have a use which does not contribute to the fire load.

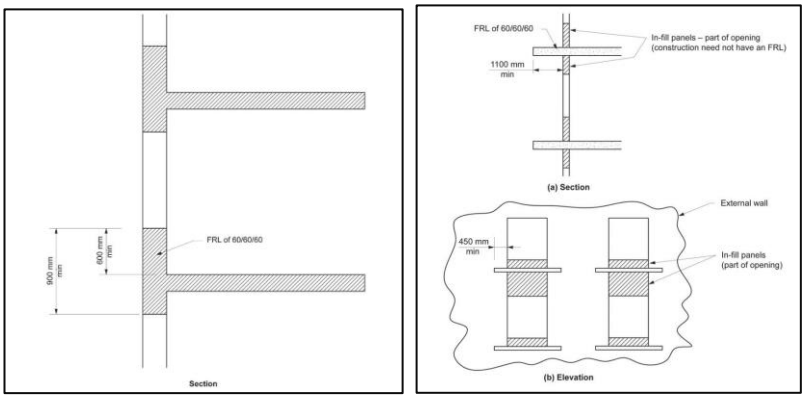
Currently the fire compartment area follows the roof line and includes the covered outdoor space outside the gymnasium and to the north of the building, the external stairs and the walkways. If these, or some of these, are confirmed to not have a use which contributes to the fire load then they can be excluded from the area calculation.



Please confirm that the maximum volume does not exceed 48,000m^3.

Vertical Separation of Openings in External Walls

If windows or other openings are above another opening in the storey below and its vertical projection is not more than 450mm then spandrels need to be provided. Detailed elevations are to be provided to verify the vertical separation of openings in the external walls complies with the requirements of BCA Clause C3D7.



To verify compliance with BCA Clause C3D7, external wall types are to be provided for review that detail the minimum FRL of 60/60/60 is achieved and the external wall is non-combustible.

Detailed elevations and wall types are to be provided to verify the vertical separation of openings complies with the prescriptive requirements of BCA Clause C3D7. The external walls are required to achieve an FRL of not less than 60/60/60 and be of non-combustible construction.

The requirements for spandrel separation do not apply to –

i. a building which has a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification 17 installed throughout; or
ii. openings within the same stairway

The fire services drawings show that sprinklers are to be provided to the building, if these comply with the requirements of AS2118.1 2017 then spandrel panels are not required to be provided.

Separation of lift shafts
As the lift shaft in the new high school connects more than three storeys it requires an FRL of 120/120/120.

Battery Rooms
Any rooms that contain a proposed battery or batteries that have a total voltage of 12 volts or more and a storage capacity of 200 kWh or more (i.e. hardwired UPS) must be fire separated from the remainder of the building by construction that achieves an FRL of at least 2 hours.

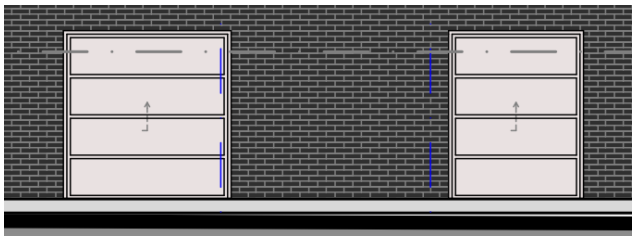
Battery system means one or more chemical cells connected in series, parallel or a combination of the two for the purpose of electrical energy storage. Please provide confirmation that the solar inverters proposed do not trigger the battery room requirements.

Electricity supply
If the main switchboard sustains emergency equipment operating in the emergency mode (e.g. a fire indicator panel) it must be separated by construction having an FRL of not less than 120/120/120 and have any door protected with a self-closing fire door having an FRL of not less than -/120/30.

Emergency equipment operating in the emergency mode include fire hydrant pumps, fire hose reel pumps and the fire indicator panel etc. It is noted that the building is to be provided with a fire indicator panel.

Opening in external walls
As the eastern external wall is less than 3m from the side boundary the door opening in the wall to the outdoor equipment storeroom is required to be provided with 1 hour self closing fire doors.

It has been confirmed that the proposed roller shutters in the eastern external wall are to be addressed in the fire engineering report.



If the existing western wall of the Type B Construction Building F is loadbearing it is required to have an FRL of 120/30/30. The existing openings are more than 6m from the proposed ground floor external wall of the new building however are less than 6m from the proposed first floor external walls and therefore the existing openings in Building F are required to be protected. It has been confirmed that the openings are to be addressed in the fire engineering report.

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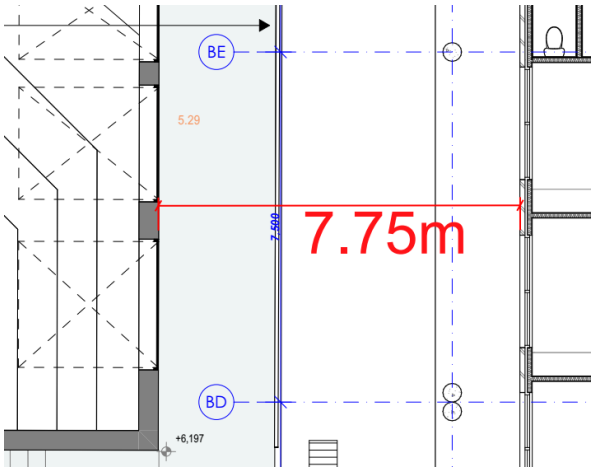
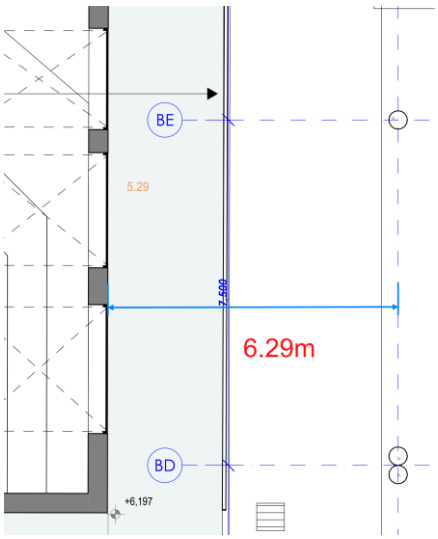
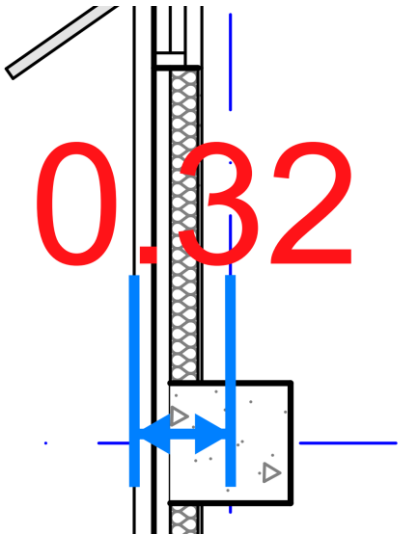


See below a markup showing the setback of the Building F external walls from Grid line B1 and the location of the external wall in relation to grid line B1. The setback of the Building F external wall from the proposed level 1 external wall is approximately 5.97m. The exact setback is required to be confirmed as the 1:200 sections show the distance to be 5.92m.





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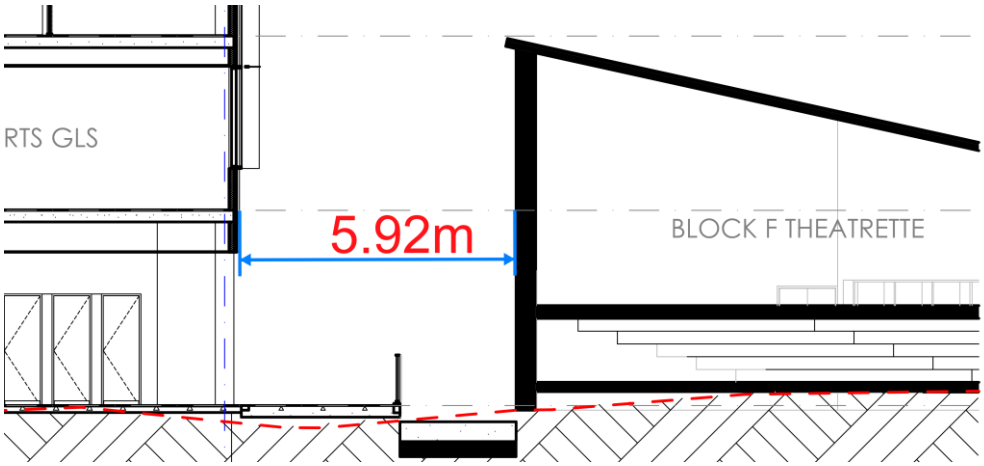


Please note that there are two requirements to address:

- If the existing western wall of the Type B Construction Building F is loadbearing it is required to have an FRL of 120/30/30, this has been confirmed by the structural engineer.
- The existing door openings in the western wall of the Type B Construction Building F are required to be protected if the wall is loadbearing and required to have an FRL of 120/30/30. These openings are to be addressed in the fire engineering report

Openings in fire-isolated exits
As the stair at grid A11 is required to be a fire isolated stair the entrance doorway to the stair shaft must be protected by –/60/30 self closing fire doors.

If the doors are held open they must auto close and the automatic-closing operation must be initiated by the activation of a smoke detector, or any other detector deemed suitable in accordance with AS 1670.1 if smoke detectors are unsuitable in the atmosphere, installed in accordance with the relevant provisions of AS 1670.1 and located not more than 1.5 m horizontal distance from the approach side of the doorway.

Service penetrations in fire-isolated exits
Fire-isolated exits must not be penetrated by any services other than—
a) Water supply pipes for fire services
b) Electrical wiring associated with—
    (i) a lighting, detection, or pressurisation system serving the exit; or
    (ii) a security, surveillance or management system serving the exit; or
    (iii) the monitoring of hydrant or sprinkler isolating valves.

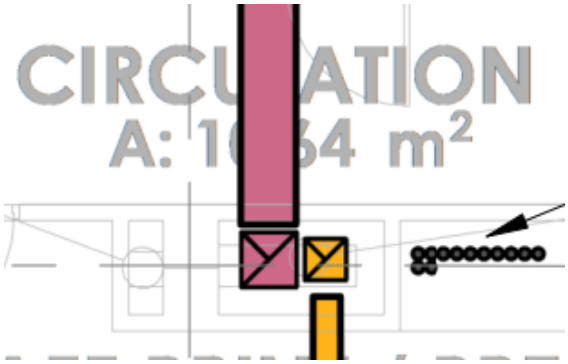
Openings in fire-isolated lift shaft
The entrance doorway to the lift shaft must be protected by –/60/– fire doors.

Lift indicator panels — A lift call panel, indicator panel or other panel in the wall of a fire-isolated lift shaft must be backed by construction having an FRL of not less than –/60/60 if it exceeds 35 000 mm^2 in area.

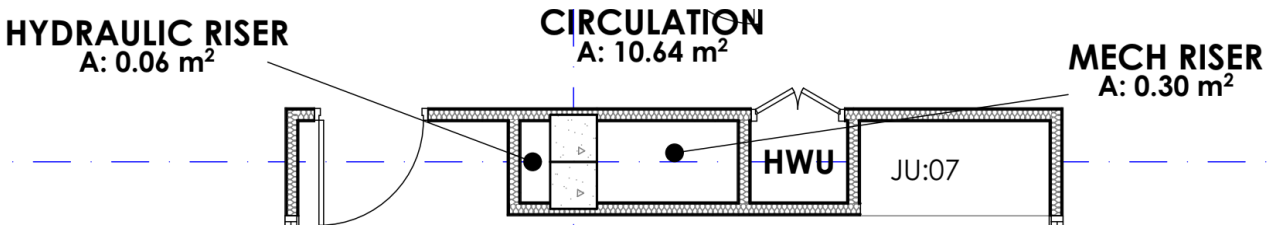
Openings in floors and ceilings for services
Where a service passes through a floor that is required to have an FRL with respect to integrity and insulation the service must be protected by a shaft complying with Specification 5 or in accordance with BCA Clause C4D15 and Specification 13.

Openings for Services Penetrations
Openings for services penetrations in any fire rated construction must be fire sealed in accordance with the requirements of BCA Clause C4D15 and Specification 13.

The developed design drawings are required to show the fire dampers in the fire rated shafts eg see the mechanical services shaft at grid BD / B2 below.



The developed architectural drawings are required to clarify if the services reticulate through the building in shafts or risers so that the appropriate protection can be specified to the service penetration of the fire rated building element. Note that the walls of non loadbearing shafts are required to have an FRL of -/90/90 and the service penetration through the walls of the shaft (ie not the floor slab) are required to be protected eg fire dampers to mechanical services shafts. Note that walls of risers are not required to have an FRL as the floor slab continues and the service penetration of the floor slab is required to be protected eg fire pillows to electrical services risers.



4.0 Egress

Principles

The building's egress systems should be designed to ensure compliance with the following principles:

- The maximum distance of travel to an exit will be 40 metres, and to a point of choice will be 20 metres, the distance between alternate exits is not to exceed 60 metres.
- The distance between alternate exits is to be not less than 9 metres.
- The construction and discharge of exits, landings, thresholds, balustrades and handrails are required to meet the requirements of the BCA.
- All paths of travel are to be a minimum of 1000mm in clear width.
- Exit doors should swing in the direction of travel i.e. outwards and should have a minimum clear width of 750mm (850mm for accessible doors complying with AS1428.1 2009).
- All doors should be free passage from the side that a person is seeking egress.
- The threshold of all doors (both sides) must be flush or provided with a threshold or kerb ramp.
- Electrical, comms or mechanical distribution boards installed along a path of travel to an exit are required to be enclosed by non-combustible construction or a fire protective covering with doorways or openings suitably sealed against smoke spreading from the enclosure.

Number of exits required

Not less than 2 exits must be provided from each storey in a secondary school with a rise in storeys of 2 or more.

When fire-isolated stairways and ramps are required

Every stairway or ramp serving as a required exit must be fire-isolated unless it connects, passes through or passes by not more than 2 consecutive storeys and one extra storey of any classification may be included if—

(A) the building has a sprinkler system (other than a FPAA101D system) complying with Specification 17 installed throughout;
(B) the required exit does not provide access to or egress for, and is separated from, the extra storey by construction having—
(aa) an FRL of –/60/60, if non-loadbearing; and
(bb) an FRL of 90/90/90 for Type A construction or 60/60/60 for Type B or C construction, if loadbearing; and
(cc) no opening that could permit the passage of fire or smoke.

Stair 1 connects 4 storeys and is required to within a fire-isolated enclosure in accordance with BCA Clause D2D4. Stair 3 connects 3 storeys in a sprinkler protected building and is not required to be fire isolated and is not required to be an external stairs in lieu of fire isolated stairs. Stair 2 connects 4 storeys and is proposed to be an external stairs in lieu of a fire isolated stairs. (See comments further down in the report under external stairs in lieu of fire isolated stairs).

Travel Distances

It is proposed to use a fire engineered performance solution to address the extended travel distance of 70m between the alternative exits through the point of choice in lieu of the BCA maximum of 60m.

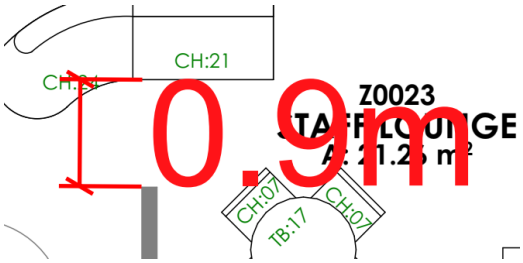
It has been confirmed that the fire engineered performance solution will rely on the use of free passage doors between the common areas and the GLS's and Workshops or the use of fire trips if these doors are required to be locked.

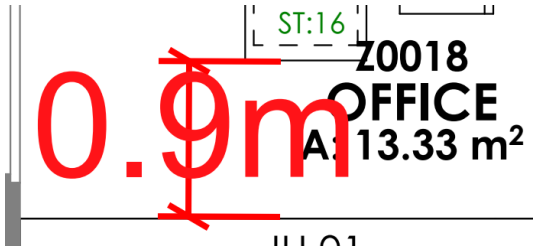
The internal connection between each room (General Learning Space rooms, Workshop rooms etc) with sliding doors shall be freely openable for an alternative egress route during a fire emergency.
[MCD Fire: We will require a fire trip to allow free passage from common learning to GLS. It is not only to do with the travel distance but also vital for the performance solution for external stairs.

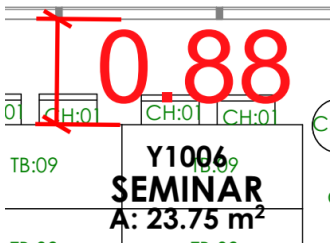
Dimensions of exits and paths of travel to exits
All paths of travel are required to have a minimum clear width of 1m. Exit doorways must be a minimum of 750mm wide, or 850mm wide where it is required to be accessible.

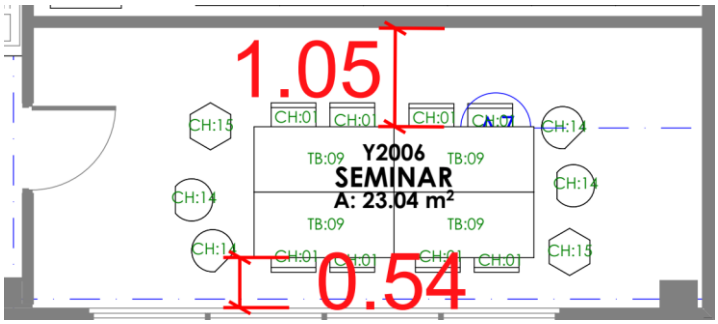
The unobstructed height throughout the egress paths must be not less than 2m.

The clear width of the path of travel in the following locations is required to be modified to achieve a minimum dimension of 1m and a construction tolerance is recommended eg 1050mm.

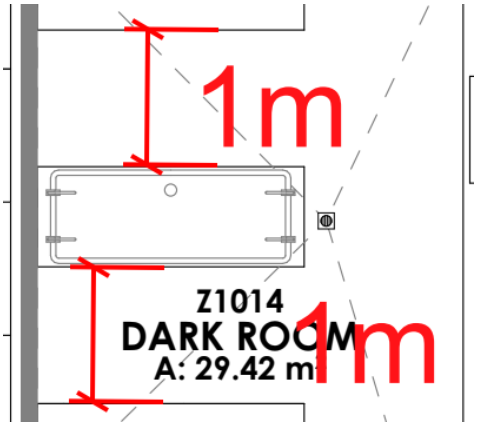


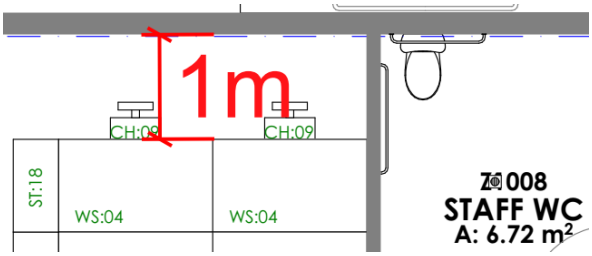






Where possible provide a construction tolerance to the 1m min clear paths of travel eg 1050mm.

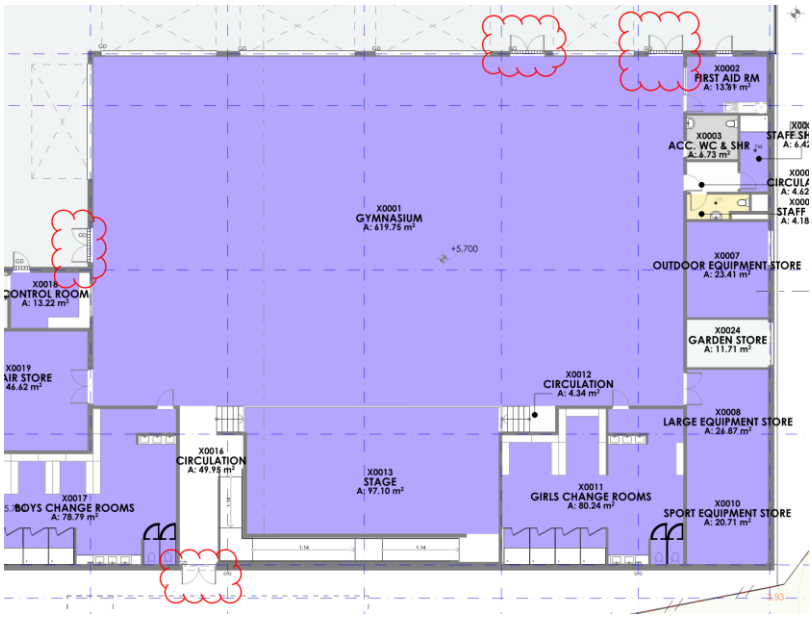




Exit width

The population count of the proposed building is required to be provided (including student and staff numbers) so that the egress can be assessed. The total population count will be used as the basis for determining the required exit width for the new high school building. Please note that there may be other limiting factors which requires the building to have less occupants e.g. toilet numbers, mechanical ventilation etc.

The double doors exits provided in the ground floor gymnasium will serve a maximum population of 950 people based on an aggregate egress width of 7.2m. These widths are to be reassessed after the issue of the door schedule.



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The fire stair and two external stairs provided on the first and second floor will serve a maximum population of 680 people based on an aggregate egress width of 6m. These widths are to be reassessed after the issue of the detailed stair drawings.

The fire stair and external stair provided on the third floor will serve a maximum population of 440 people based on an aggregate egress width of 4m. These widths are to be reassessed after the issue of the detailed stair drawings.

Discharge from exits
Where the exit leads to an open space, the path of travel to the road must have an unobstructed width throughout of not less than 1m.

Where an exit discharges to open space that is at a different level than the public road to which it is connected, the path of travel to the road must be by a ramp or other incline having a gradient not steeper than 1:8 at any part, or not steeper than 1:14.

Travel via fire-isolated exits

The BCA states that each fire-isolated stairway or fire-isolated ramp must provide independent egress from each storey served and discharge directly, or by way of its own fire-isolated passageway—

(i) to a road or open space; or
(ii) to a point—
(A) in a storey or space, within the confines of the building, that is used only for pedestrian movement, car parking or the like and is open for at least 2/3 of its perimeter; and
(B) from which an unimpeded path of travel, not further than 20 m, is available to a road or open space; or
(iii) into a covered area that—
(A) adjoins a road or open space; and
(B) is open for at least 1/3 of its perimeter; and
(C) has an unobstructed clear height throughout, including the perimeter openings, of not less than 3 m; and
(D) provides an unimpeded path of travel from the point of discharge to the road or open space of not more than 6 m.

Where a path of travel from the point of discharge of a fire-isolated exit necessitates passing within 6 m 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—
(i) an FRL of not less than 60/60/60; and
(ii) any openings protected internally in accordance with C4D5,
for a distance of 3 m above or below, as appropriate, the level of the path of travel, or for the height of the wall, whichever is the lesser.

External stairways in lieu of fire-isolated exits
Stair 2 connects 4 storeys and is proposed to be an external stairways in lieu of fire isolated stairs and is required to comply with the following requirements. (Stair 3 only connects 3 storeys in a sprinkler protected building and is not required to comply with these requirements.)

The exit is required to be non-combustible throughout and require all the external walls within 6m of the external stairs to be provided with an FRL of 60/60/60, no openings are permitted within 3m of the stair and any opening 3m-6m from the stairs are required to be protected in accordance with BCA Clause C4D5 e.g. fire doors, fire shutters over window or fixed windows and internal drenchers.

Stair 2 has doors and window openings within 3 – 6 m and the stairs are required to be moved further away from the external walls of the building so that there is a minimum 6m separation (and no FRL or opening protection is required) or if within 3 – 6m an FRL and opening protection is required.

The FEBQ addresses these requirements and the lack of fire rating and protection to the openings is proposed to be addressed in a fire engineered performance solution.

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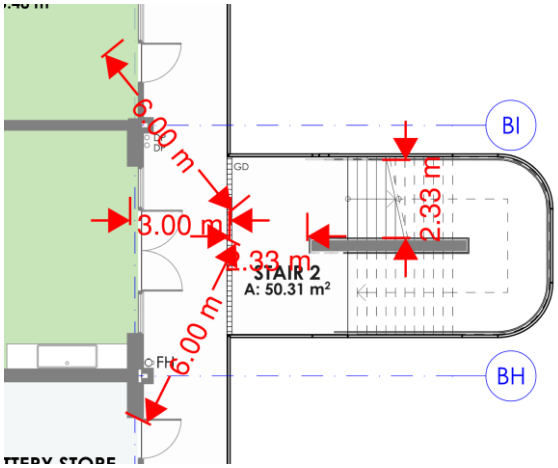
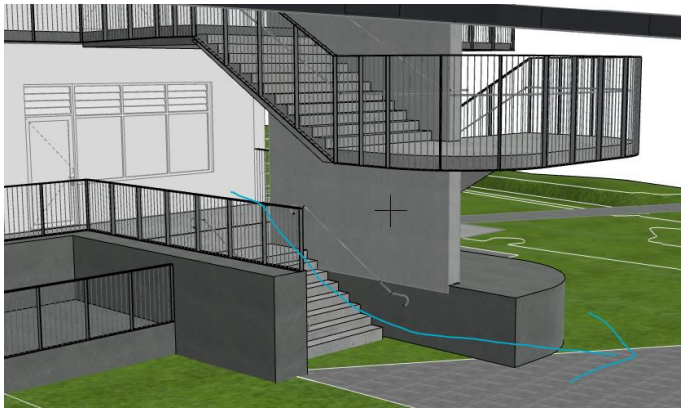
Refer to Appendix B of this report (and the extract below) for details of the BCA requirements for external stairs in lieu of fire isolated stairs.



The discharge path from the base of Stair 2 is directly to the open space as shown in the figure below.



Travel by non-fire-isolated stairways or ramps
The travel distance from the furthest point on the Level 03 to open space on the ground floor via the non fire isolated stairs is less than the maximum distance of 80m.

Distance between alternative exits
The BCA states that exits that are required as alternative means of egress must be distributed as uniformly as practicable within or around the storey served. (D2D6)

The BCA states that discharge point of alternative exits must be located as far apart as practical. (D2D15)

Discharge from exits
Where the exit leads to an open space, the path of travel to the road must have an unobstructed width throughout of not less than 1m.

Where an exit discharges to open space that is at a different level than the public road to which it is connected, the path of travel to the road must be by a ramp or other incline having a gradient not steeper than 1:8 at any part, or not steeper than 1:14.

Fire-isolated stairways and ramps
A stairway or ramp (including any landings) that is required to be within a fire-isolated shaft must be constructed of non-combustible materials and so that if there is local failure it will not cause structural damage to, or impair the fire-resistance of, the shaft.

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If the stair is fire isolated it will require:

- the fire hydrant has to be located inside the fire isolated shaft;
- any permitted services penetrations have to be fire sealed;
- only the following electrical wiring associated with the following may be installed in the fire-isolated exit—
  (i) a lighting, detection, or pressurisation system serving the exit; or
  (ii) a security, surveillance or management system serving the exit; or
  (iii) the monitoring of hydrant or sprinkler isolating valves

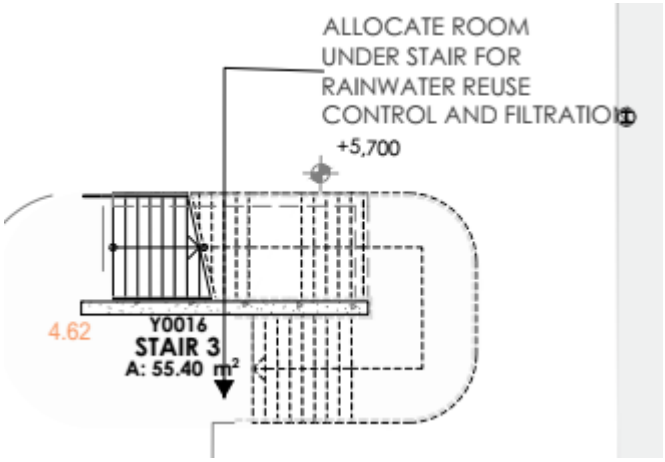
Non-fire-isolated stairways and ramps
As the proposed building has a rise in storeys of more than 2, the external stairs in lieu of fire isolated stairs (including landings and any supporting building elements) must be constructed of—
(a) reinforced or prestressed concrete; or
(b) steel in no part less than 6 mm thick; or
(c) timber that—
(i) has a finished thickness of not less than 44 mm; and
(ii) has an average density of not less than 800 kg/m3 at a moisture content of 12%; and
(iii) has not been joined by means of glue unless it has been laminated and glued with resorcinol formaldehyde or resorcinol phenol formaldehyde glue.

Installations in exits and paths of travel
All new proposed electrical, comms or mechanical distribution boards installed along a path of travel to an exit are required to be enclosed by non-combustible construction or a fire protective covering with doorways or openings suitably sealed against smoke spreading from the enclosure.

Enclosure of space under stairs and ramps
(a) Fire-isolated stairways and ramps — If the space below a required fire-isolated stairway or fire-isolated ramp is within the fire-isolated shaft, it must not be enclosed to form a cupboard or similar enclosed space. (If it is chosen to make the stair fire isolated the store must be removed.)

(b) Non fire-isolated stairways and ramps — The space below a required non fire-isolated stairway (including an external stairway) or non fire-isolated ramp must not be enclosed to form a cupboard or other enclosed space unless—
(i) the enclosing walls and ceilings have an FRL of not less than 60/60/60; and
(ii) any access doorway to the enclosed space is fitted with a self-closing –/60/30 fire door
(If it is chosen to make the stair non-fire isolated the store must be fire rated. Refer to the head height section of the report for further comments.)

Landscape drawing L-05 states that a room is to the provided under stair 3 for services. Provide details of this room in the developed design drawing including the fire rating to the enclosing wall and ceiling and the fire rating to the door as per the requirements above.



Stairs
The proposed stairs are required to be provided with risers and goings that have a constant dimension throughout the flight and with a handrail with a height of 865-1000mm.

The BCA states that risers are not permitted to have any openings that would allow a 125mm sphere to pass through between the treads.

The treads or nosing strips of the proposed stairs must have a slip-resistance classification not less than P4 (for wet) and P3 (when dry) when tested in accordance with AS 4586-2013.

Landings
Proposed landings are required to have a maximum gradient of 1:50 and must be not less than 750mm long, and where this involves a change in direction, the length is measured 500mm from the inside edge of the landing.

The edge of any proposed landings or the nosing strips of the proposed new landings must have a slip-resistance classification not less than P4 (for wet) and P3 (when dry) when tested in accordance with AS 4586 2013.

Thresholds
The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless the doorway opens to a road or open space or is provided with a threshold ramp or step ramp in accordance with AS1428.1-2009.

Balustrades
All proposed balustrades that protect a drop of more than 1m along a floor, corridor, hallway, balcony, deck, verandah, mezzanine, access bridge or the like are to be a minimum of 1m high and any openings are to have a maximum size of 125mm.

Balustrades to stairs and ramps that protect a fall of more than 1m are required to have a minimum height of 865mm and maximum openings of 125mm. Where the stair and ramp landings have a length of more than 500mm the balustrade is required to have a height of not less than 1m.

If balustrades protect a fall of more than 4m above the surface beneath then balustrade is not permitted to have any horizontal or near horizontal elements between 150 mm and 760 mm above the floor that facilitates climbing.

Any proposed mesh balustrades to the stairs and walkways is required to comply with the loading requirements of AS NZS 1170.1 2002.

Handrails
Handrails are required to be provided along a least one side of stairs and ramps and are required to have a height of 865-1000mm. The recommended height for this handrail is 900mm.

The BCA states that handrails are required to be located along each side if the total width of the stairway or ramp is 2m or more.

Handrails are required to be continuous between stair flight landings and have no obstruction on or above them that will tend to break a hand-hold.

Fixed platforms, walkways, stairways and ladders
A fixed platform, walkway, stairway, ladder and any other going and riser, landing, handrail or barrier attached thereto may comply with AS1657 where it serves plant rooms and the like.

Swinging doors
The discharge door of the fire-isolated exit on ground floor does not swing in the direction of egress and is required to be redesigned so that they swing outwards.

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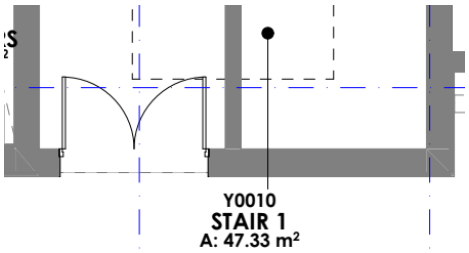


Door hardware
The door hardware to all proposed swing doors must be readily openable without a key from the side that faces a person seeking egress by:

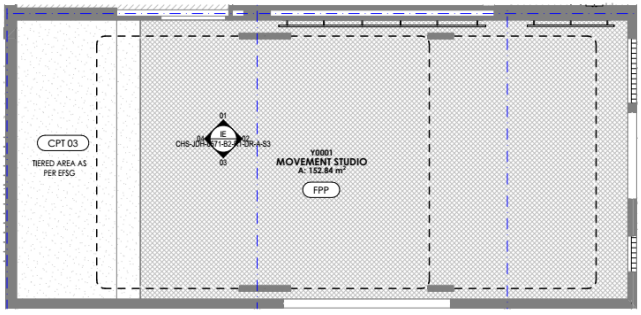
- a single hand downward action on a single device which is located between 900 mm and 1.1 m from the floor and be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch and have a clearance between the handle and the back plate or door face at the centre grip section of the handle of not less than 35 mm and not more than 45mm; or
- a single hand pushing action on a single latch operation device which is located between 900 mm and 1.2 m from the floor.

Please confirm if the sliding doors from the learning common to the GLSs will be free passage from the learning common side. If they are not then note that the fire engineer will require a fire trip to be provided.

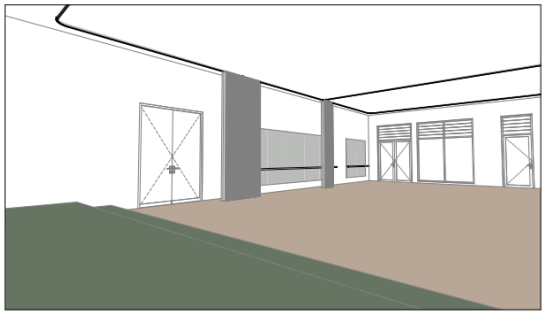
5.0 Disabled Access

General building access requirements
Disabled access is required to be provided to and within all areas in the proposed building that are normally used by the occupants. (Refer to the exemption available mentioned below.)

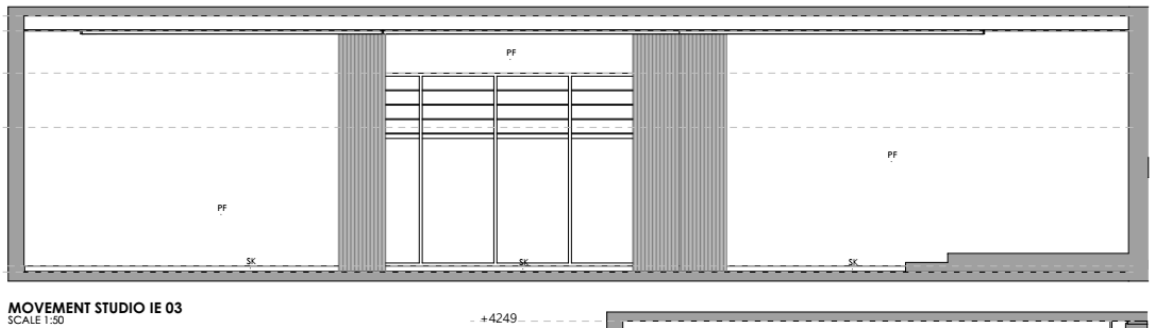
The tiered area proposed to the movement studio as stated on CHS-JDH-0571-B2-R1-DR-A-S3 is required to be accessible and provided with a ramp complying with As1428.1 2009.



MOVEMENT STUDIO PLAN
SCALE 1:100

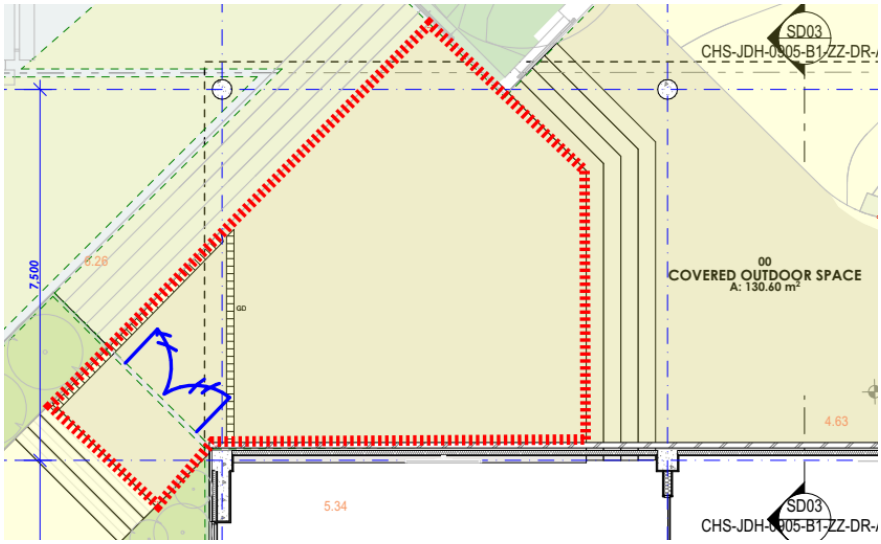


MOVEMENT STUDIO INTERIOR

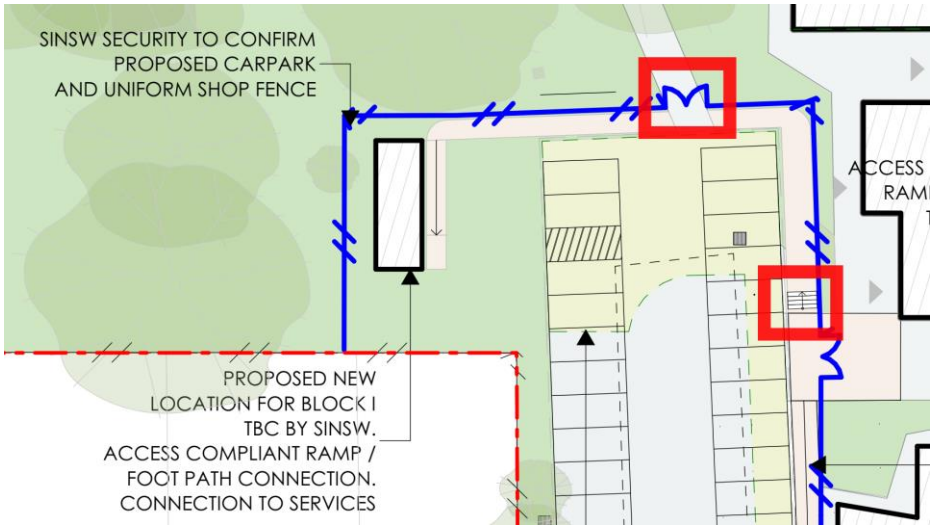


MOVEMENT STUDIO IE 03
SCALE 1:50

The BCA states that disabled access is required to be provided to and within all areas in the proposed building that are normally used by the occupants. The lower level of the covered outdoor space at the northern end of the building does not comply with this requirement and access is required to be provided to the space.



The BCA states that disabled access is required to be provided to the proposed relocated uniform shop. Details showing the compliance of the accessible path are to be provided in the next design stage and may require the upgrade of existing paths.



An accessway must be provided to a proposed (relocated) building that is required to be accessible –

a) from the main points of a pedestrian entry at the allotment boundary; and
b) from another accessible building connected by a pedestrian link; and
c) from any required accessible carparking space on the allotment

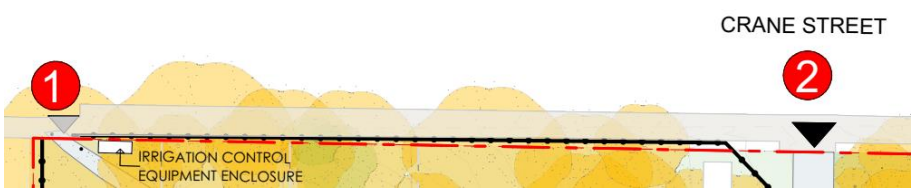
In a proposed building required to be accessible, and accessway must be provided through the principal pedestrian entrance.

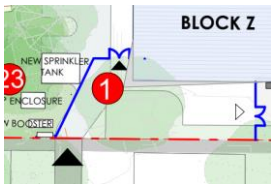
Further details are required to show how access to building is being provided from the above areas (allotment boundary, accessible buildings and accessible carspaces). Note that existing pathways may need to be upgraded to achieve compliance in accordance with AS 1428.1-2009.

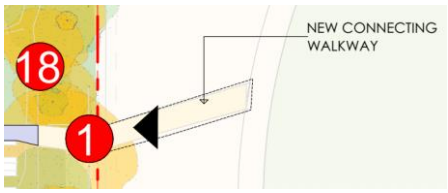
From the allotment boundary

The BCA states that an accessible path of travel is required to be provided from the main points of a pedestrian entry at the allotment boundary to the proposed new building and is required to comply with AS1428.1 2009.

The developed design drawings are required to clarify which of the pedestrian access points at the boundary are the main point / points of pedestrian entry and these are required to provide an accessible path of travel to the proposed building.





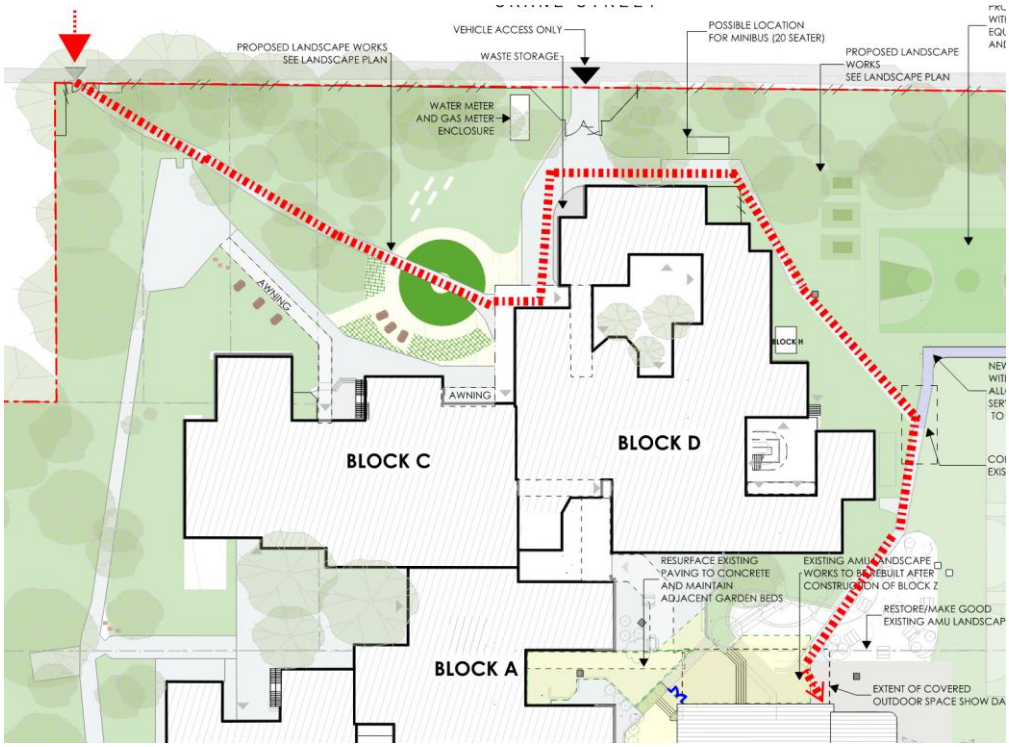


1 PEDESTRIAN ACCESS TO SCHOOL

After the main points of pedestrian entry at the allotment boundary are confirmed the extent of upgrade of any existing paths that connects the entry to the proposed building can be identified.

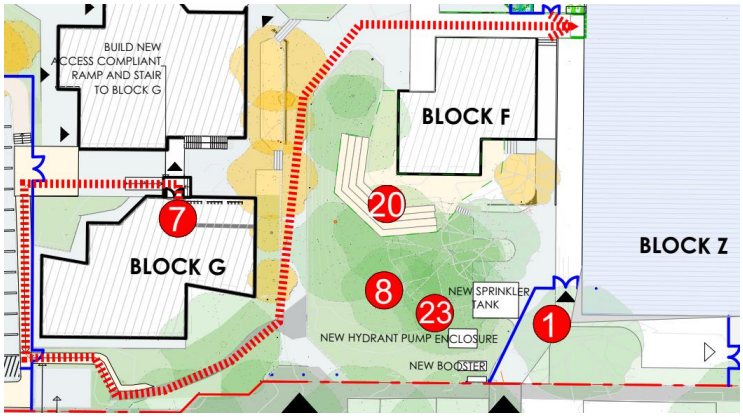
If gates are not used as a main point of pedestrian entry at the allotment boundary to the proposed building then the paths connecting it to the proposed building are not required to be upgraded to be accessible.

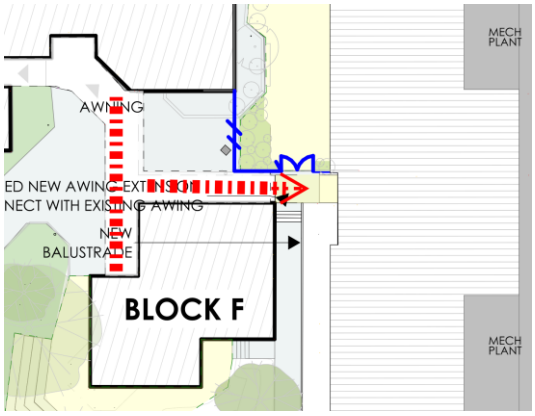
If the gate at Crane Street is a main point of pedestrian entry at the allotment boundary the path to the proposed building is required to be upgraded so that it complies with the requirements of AS1428.1 2009. Refer to comments in the BCA audit of existing conditions report on the compliance of the existing paths.

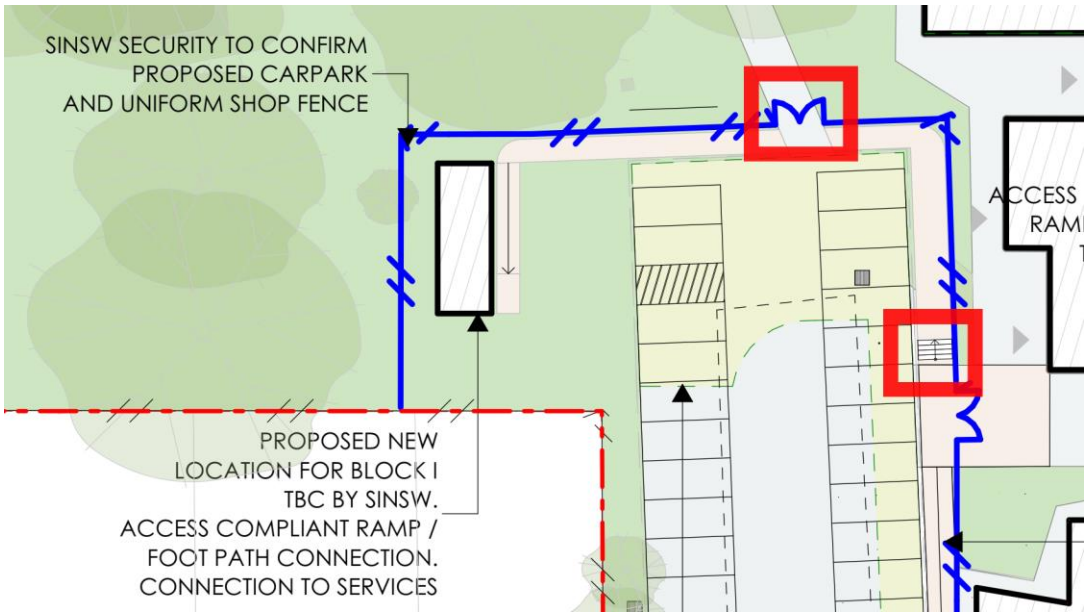


From another accessible building connected by a pedestrian link
The accessible path of travel between the buildings is required to comply with AS1428.1 2009.

Further details are required to be provided that show how access between the new building, relocated uniform store and surrounding buildings is achieved. Note that existing pathways connecting the existing buildings may need to be upgraded.



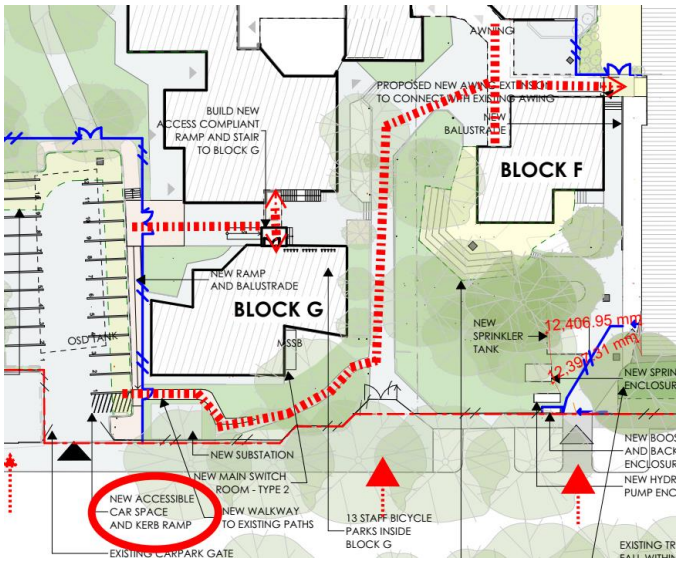


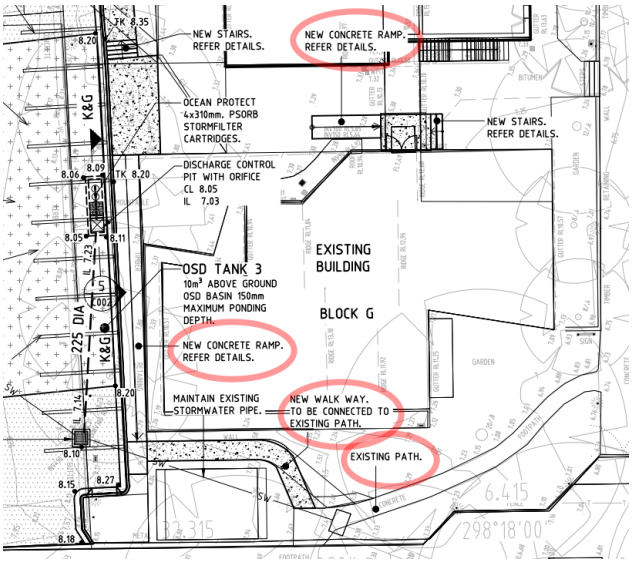


In a building required to be accessible, and accessway must be provided through the principal pedestrian entrance.

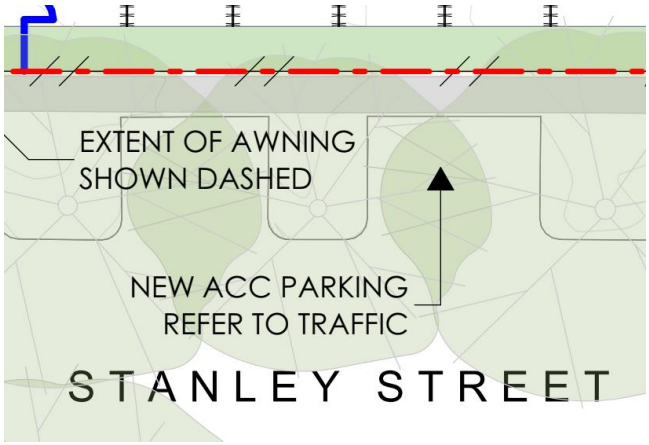
Accessible Carspaces
The BCA states that disabled access must be provided to the proposed buildings from any existing and proposed accessible car spaces. The accessible path of from the accessible car spaces to the new building is required to comply with AS1428.1 2009.

Please note that the existing pathways connecting the proposed accessible carspace to the accessible building may need to be upgraded to achieve compliance to the requirement of AS1428.1 2009 and details are required to be provided within the developed design drawings.





Please note that the BCA states that accessible carparking spaces must be provided in a carparking area on the same allotment as a building required to be accessible and that the one proposed for Stanley Street does not comply with the BCA. However the BCA only requires one accessible carspace and the one provided in the carpark meets the BCA requirements.



Continuous accessible paths of travel

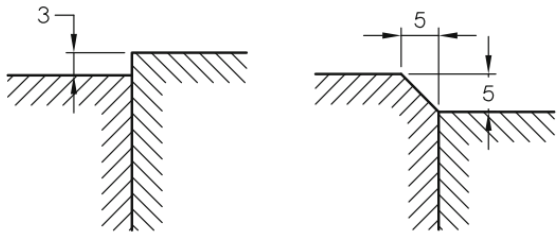
The minimum unobstructed height of a continuous accessible path of travel is required to be 2m or 1.98m at doorways and the minimum width is required to be 1m and 850mm at doorways.

Fixtures and fittings such as lights, awnings, operable parts of windows, telephones, skirtings, essential fixtures and fittings such as fire hose reels, fire extinguishers and switchboards are not permitted to intrude into the minimum unobstructed width.

1.8m wide x 2m long passing spaces are required to be provided within 20m intervals on those parts of an accessway where a direct line of sight is not available.

Turning spaces complying with As1428.1 2009 are required to be provided within 2m of the end of accessways where it is not possible to continue travelling along the accessway and at maximum 20m intervals along the accessway.

Floor or ground surfaces on continuous accessible paths of travel and circulation spaces
The access requirements include a requirement that the abutment of surfaces shall have a smooth transition. Design transition shall be 0 mm. Construction tolerances shall be 0 ±3 mm for vertical changes in level and 0 ±5 mm provided the edges have a bevelled or rounded edge to reduce the likelihood of tripping.



(a) Change in level

The pile height or pile thickness of any proposed carpet is required to not exceed 11mm and the carpet backing thickness shall not exceed 4 mm.

Grates provided along a continuous accessible path of travel and in circulation spaces are required to comply with the following:

- Circular openings shall be not greater than 13 mm in diameter.
- Slotted openings shall be not greater than 13 mm wide and be oriented so that the long dimension is transverse to the dominant direction of travel.

Slip Resistance
A continuous accessible path of travel and any circulation spaces shall have a slip-resistant surface. The texture of the surface shall be traversable by people who use a wheelchair and those with an ambulant or sensory disability.

The following table lists the minimum slip resistance classifications for common locations.

Location	Wet pendulum test	Oil-wet inclining platform test
External ramps steeper than 1:14	P5	R12
External ramps and walkways not steeper than 1:14	P4	R11
Wet areas eg toilets	P3	R10
Transitional areas	P2	R9
Dry areas	P1	R9
Stair tread or landing surface - Dry	P3	R10
Stair tread or landing surface - Wet	P4	R11
Stair nosing or landing edge strip - Dry	P3	-
Stair nosing or landing edge strip - Wet	P4	-

Provide the slip test results for the proposed floor finishes so that compliance can be confirmed prior to design completion.

Walkways
Where provided walkways are required to be provided with landings at all changes in direction and at every doorway, gate, or similar opening.

Landings are required to have a minimum length of 1200mm where there is no change in direction and a minimum length of 1500mm where there is a change of direction not exceeding 90°. In addition, the internal corner shall be truncated for a minimum of 500mm in both directions for landings provided where there is a change in direction.

Landings provided for walkways with a change in direction of 180° are required to have a minimum length of 1540mm.

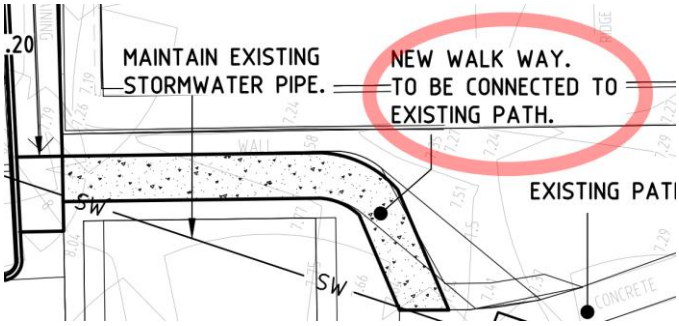
The floor or ground surface abutting the sides of the walkway are required to be provided with a firm and level surface of a different material to that of the walkway at the same level of the walkway, follow the grade of the walkway and extend horizontally for a minimum of 600 mm unless one of the following is provided to both sides of the walkway:

- A kerb with a minimum height of 65mm; or
- A kerb rail and handrail; or
- A wall not less than 450 mm in height.

Both turf and planting can't be used as they are not considered 'firm'. Note that concrete either side of the pathway doesn't qualify as a firm and level surface as the material is the same as the walkway (concrete).

The gradient of all inclined surfaces should be stated on the drawings and all walkways are required to comply with the requirements of AS 1428.1 2009. Please note that a gradient of 1:40 is considered level and doesn't require treatment to either side.

Provide details of the proposed walkways in the developed design drawings for review.



Ramps

Where ramps are proposed, they are required to be provided with a maximum gradient of 1:14.

Ramps are required to be provided with landings at all changes in direction and at every doorway, gate, or similar opening. Ramps are required to be provided with landings at intervals of not greater than 9m for ramp gradients of 1:14 and at intervals of not greater than 15m for ramp gradients steeper than 1:20.

For ramp gradients between 1:14 and steeper than 1:20, landings are required to be provided at intervals that shall be obtained by linear interpolation.

Landings are required to have a minimum length of 1200mm where there is no change in direction and a minimum length of 1500mm where there is a change of direction not exceeding 90°. In addition, the internal corner shall be truncated for a minimum of 500mm in both directions for landings provided where there is a change in direction.

The widths of ramps and landings are required to be measured clear of handrails and kerbrails.

Ramps shall have a handrail on each side of the ramp. The handrails are required to extend at least 300mm past the top and bottom of the ramp and have a turndown of 180° or be returned to the ground and are required to be continuous around landings.

Where the intersection of the base or top of a ramp is at an internal corridor, the ramp shall be set back by a minimum of 400mm so that the handrail extension does not protrude into the transverse path of travel.

Ramps and intermediate landings are required to be provided with kerbs or kerb rails on both sides that:

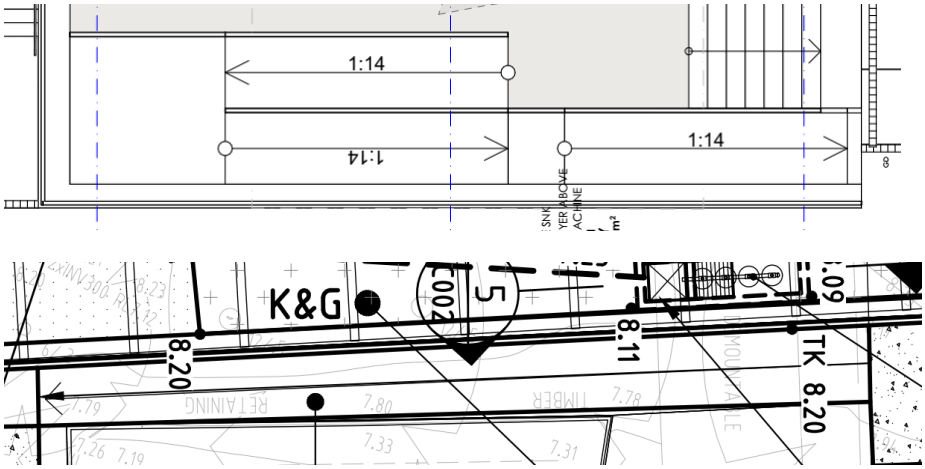
- Have a minimum height above the finished floor of 65mm.
- Have a height of the top of the kerb or kerb rail that is not within the range 75mm to 150mm above the finished floor.
- The kerb or kerb rail is not permitted to have longitudinal gaps or slots greater than 20mm within the range 75mm to 150mm above the finished floor.

Ramp handrails with a height of 865-1000mm (900mm recommended) and 665-750mm (700mm recommended) are required to be installed on both sides of the ramp, are to be continuous throughout the ramp flight and, where practicable, around landings.

The cross-section of handrails is required to be circular or elliptical, not less than 30mm or greater than 50mm in height or width for not less than 270° around the uppermost surface.

The clearance between a handrail and an adjacent wall surface or other obstruction is required to be not less than 50mm. This clearance shall extend above the top of the handrail by not less than 600mm.

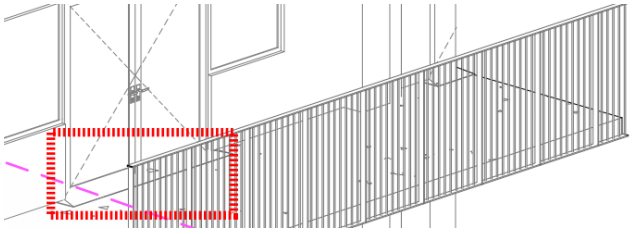
Provide details of the proposed ramps in the developed design drawings for review.

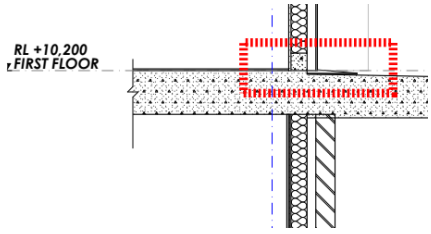


Threshold Ramps

AS1428.1 2009 requires a max grade of 1:8 for threshold ramps and they should not be under the door, they should start at its edge or a max distance of 20mm from it.

Provide details of the proposed threshold ramps in the developed design drawings for review.





Stairs

Stairs are required to have opaque risers and the stair nosing's are not permitted to project beyond the face of the riser.

Each stair tread nosing is required to be provided with a strip not less than 50mm and not more than 75mm deep across the full width of the path of travel. The strip may be set back a maximum of 15mm from the front of the nosing and is required to have a minimum luminance contrast of 30% to the background. (Note that black nosing strips should be specified to uncoloured concrete stairs.)

Stair handrails with a height of 865-1000mm (900mm recommended) are required to be installed on both sides of the stairs, are to be continuous throughout the stair flight and, where practicable, around landings.

The cross-section of handrails is required to be circular or elliptical, not less than 30mm or greater than 50mm in height or width for not less than 270° around the uppermost surface.

Where a handrail terminates at the bottom of a flight of stairs, the handrail is required to extend at least one tread depth parallel to the line of nosings plus minimum of 300mm horizontally from the last riser. The handrail is required to extend a minimum of 300mm horizontally past the nosing on the top riser.

The clearance between a handrail and an adjacent wall surface or other obstruction is required to be not less than 50mm. This clearance shall extend above the top of the handrail by not less than 600mm.

Provide details of the proposed stairs in the developed design drawings for review.

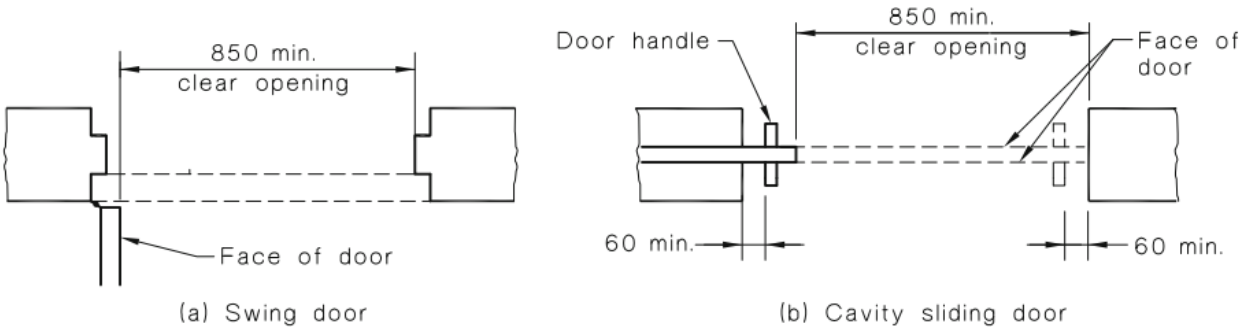
Doorways

Doorways are required to be provided with a minimum luminance contrast of 30% between:

- door leaf and door jamb;
- door leaf and adjacent wall;
- architrave and wall;
- door leaf and architrave; or
- door jamb and adjacent wall.

The minimum width of the area of luminance is required to be 50mm. Note that frameless glazed doors will not comply with this requirement and should not be specified.

Doorways are required to be provided with a minimum clear opening width of 850mm and where sliding doors are provided the clear opening width must allow for a minimum 60mm gap between the door handle and the door frame when the door is open and closed.



At least one leaf of all double doors is required to have a minimum clear width of 850mm.

Circulation spaces are required to be provided at every doorway, gate, or similar entry way, on a continuous accessible path of travel. The circulation space required will depend on the type of door ie swing or sliding and the angle of approach ie side or front on etc.

Where possible the required circulation space should be provided with a construction tolerance and the required dimension of any latch side wall should be stated on the drawings.

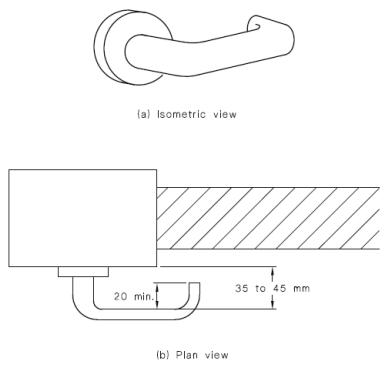
Door handles and related hardware are required to be of the type that allows the door to be unlocked and opened with one hand. The handle is required to be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch. ‘D’ type handles shall be provided on sliding doors.

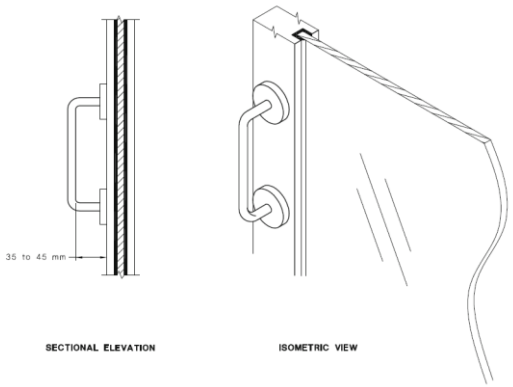
The clearance between the handle and the back plate or door face at the centre grip section of the handle is required to be not less than 35mm and not more than 45mm.

Where snibs are installed, they shall have a lever handle of a minimum length of 45mm from the centre of the spindle.

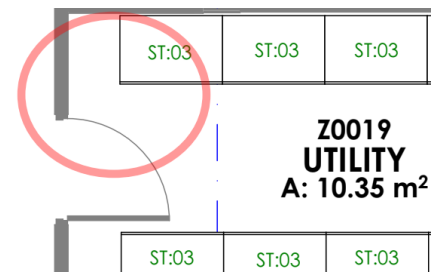
For doors other than fire doors where a door closer is fitted, the force required at the door handle to operate the door shall not exceed 20N. Note that this applies particularly to the proposed large sliding doors.

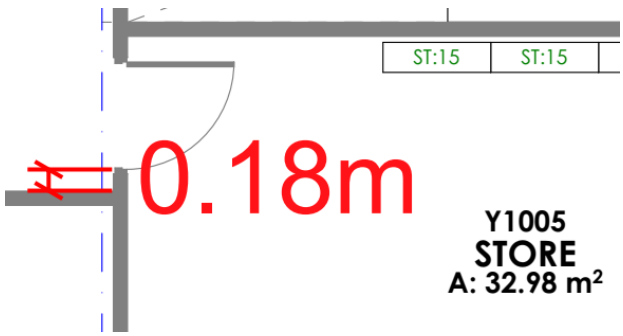
Where an outward opening door is not self-closing, a horizontal handrail or pull bar is required to be fixed on the closing face of a side-hung door.

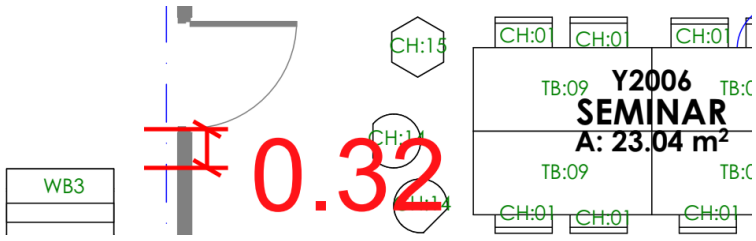




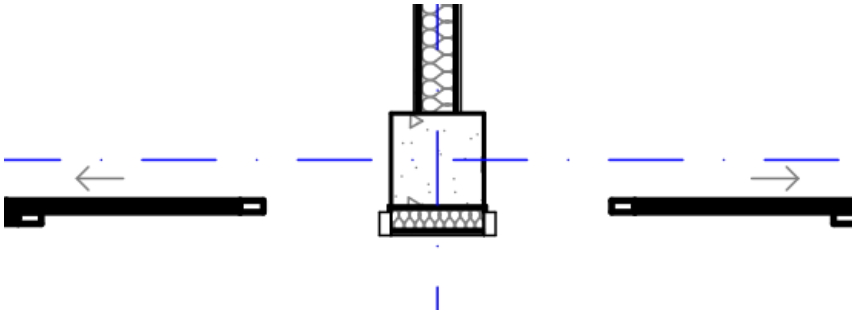
The circulation spaces of the following doorways is required to be modified to meet the minimum requirements of AS 1428.1 2009.

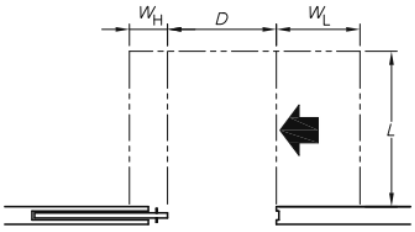






All sliding doors are required to be provided with a minimum internal latch side circulation space of 395mm and a tolerance is recommended. See examples below.

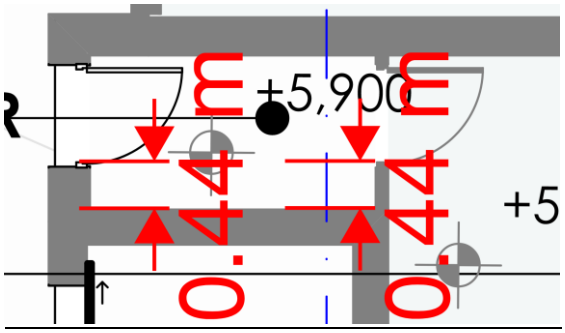


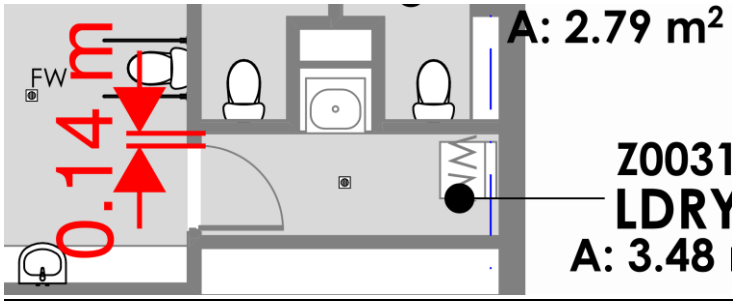


Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1230	185	660
900	1230	180	660
950	1230	180	660
1000	1230	180	660

(b) Latch-side approach

There is no automatic exemption from the lack of disabled access into rooms such as the comms rooms on ground, level 1, 2 and 3 and laundry and the client is required to confirm that disabled access is not required due to access being inappropriate.





Switches & Controls

All switches and controls on an accessible path of travel, other than general purpose outlets, are required to be located not less than 900 mm nor more than 1100mm above the plane of the finished floor and not less than 500mm from internal corners.

This applies to light switches, intercoms, card readers etc and this requirement should be stated on the architectural and services drawings.

Exemptions

The following areas are not required to be accessible:

- An area where access would be inappropriate because of the particular purpose for which the area is used.
- An area that would pose a health or safety risk for people with a disability.
- Any path of travel providing access only to an area exempted by (a) or (b).

This generally applies to plant rooms and other areas used occasionally by maintenance personnel. It should not be used for exempting disabled access into store rooms or other areas used occasionally by staff.

Glazing on an accessway
All frameless or fully glazed doors, sidelights, including any glazing capable of being mistaken for a doorway or opening, shall be clearly marked for their full width with a solid and non-transparent contrasting line.

The contrasting line shall be not less than 75 mm wide and shall extend across the full width of the glazing panel. The lower edge of the contrasting line shall be located between 900 mm and 1000 mm above the plane of the finished floor level.

Any contrasting line on the glazing shall provide a minimum of 30% luminance contrast when viewed against the floor surface or surfaces within 2 m of the glazing on the opposite side.

Signage
If a hearing augmentation system is required (see section below) signage including the international symbol for deafness in accordance with AS 1428.1 must be provided within the room containing the hearing augmentation system identifying—
(i) the type of hearing augmentation; and
(ii) the area covered within the room; and
(iii) if receivers are being used and where the receivers can be obtained

Where a pedestrian entrance is not accessible directional signage incorporating the international symbol of access must be provided to direct a person to the location of the nearest accessible pedestrian entrance.

Hearing augmentation
A hearing augmentation system must be provided where an inbuilt amplification system, other than one used only for emergency warning, is installed in a room in a Class 9b building.

F000 states that hearing augmentation is to be provided, provide details for review.

10. HEARING AUGMENTATION REQUIREMENT TO BE COORDINATED WITH ELECTRICAL SERVICES CONTRACTOR.

HEARING AUGMENTATION

1. HEARING AUGMENTATION REQUIREMENT FOR CLASS 9B ROOMS IN ACCORDANCE WITH NCC 2019 D3.7 TO BE PROVIDED BY ELECTRICAL SERVICES CONTRACTOR. REFER TO ELECTRICAL SERVICES DOCUMENTS.

Tactile indicators
Tactile indicators are to comply with AS1428.4.1 2009 must be provided to:

- a stairway used for general communication;
- a ramp;
- the underside of an overhead obstruction less than 2m in height (eg stair soffit) unless a suitable barrier (eg handrail) is provided.

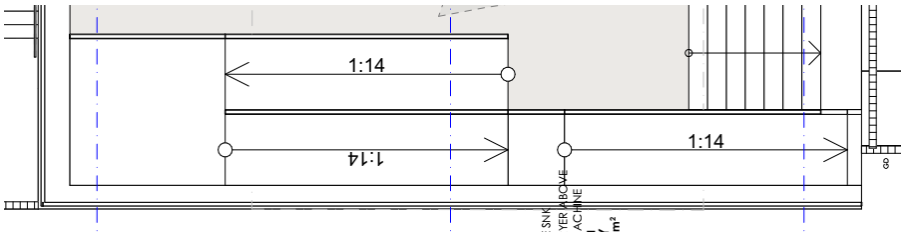
Tactile indicators are required to have a luminance-contrast to the base surface as follows:

- Where the integrated TGSIs are of the same colour as the underlying surface—not less than 30% across its entire area.
- Where discrete TGSIs—not less than 45%.
- Where discrete TGSIs are constructed using two colours or materials, the raised surface shall have a section that has 60% luminance contrast for a diameter of 25 ±1 mm tested as required below

The underside of the bottom flight of stairs to the two external stairs are required to be protected as stated above.

Address: Suite 102, 12 Mount Street, North Sydney NSW 2060 | Email: admin@metrobc.com.au | Phone: (02) 9692 8477 | Fax: (02) 8209 4955

Please ensure that the proposed strip drains at the top of the ramp do not clash with the tactile indicators.



Wheelchair Seating Spaces

Where fixed seating is provided in the building, wheelchair seating spaces complying with AS1428.1 2009 must be provided.

The number and grouping of wheelchair seating spaces must be in accordance with the table below:

Table D4D10: Wheelchair seating spaces in Class 9b assembly buildings

Fixed seats in a room or space	Wheelchair spaces Note 1		Grouping and location			Spaces must represent range of seating provided Note 3
	Minimum spaces required	1 additional space required per Note 2	Min. single spaces	Min. groups of 2 spaces	Max. spaces in any other group	
Up to 150	3	N/A	1	1	N/A	No

Please note that the wheelchair seating spaces are required to be provided in line within the fixed seating as per AS1428.1 2009.

Currently no fixed seating is proposed and this requirement is not applicable.

Accessible sanitary facilities

The BCA states that at least one accessible toilet must be provided in each storey that is provided with toilets.

The BCA states that where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments an accessible toilet must be provided at not less than 50% of those banks.

The accessible toilets are required to be provided with the minimum circulation spaces and requirement stated in AS1428.1 2009 which includes:

- A minimum width of 1900mm and minimum length of 2300mm for toilet pans;
- The basin is not to encroach by more than 100mm into the required circulation space;
- A toilet pan with a seat height of 460-480mm, set out 450-460mm from the side wall to the centre line and located 790-810mm from the back wall to the front of the pan;
- A toilet seat with a minimum 30% luminous contrast to the floor finish;
- Grabrails at a height of 790-810mm and able to withstand a force of 110 N applied at any position and in any direction without deformation or loosening or rotation of the fastenings or fittings;
- Backrests that have a height, at the lower edge of backrest to the top of the seat, of 120mm to 150mm, that have a vertical height of 150–200mm and a width of 350–400mm and that are capable of withstanding a force in any direction of 110N;
- Washbasins that have a height of 800-830mm to the front edge.
- Ancillary fixtures and fittings eg toilet paper holder, shelves, mirrors, hooks etc and any accessible shower set out as per the requirement of As1428.1 2009.
- Where an outward opening door is not self-closing, a horizontal handrail or pull bar shall be fixed on the closing face of a side-hung door, as shown in Figure 36 of AS1428.1 2009.
- Outward-opening doors shall have a mechanism that holds the door in a closed position without the use of a latch.

The BCA states that where two or more of each type of accessible unisex sanitary facility are provided, the number of left and right handed mirror image facilities must be provided as evenly as possible.

Provide details of the toilets in the developed design drawings for review.

Ambulant facilities
The BCA states that at each bank of toilets where there is one or more toilets in addition to an accessible toilet at that bank of toilets, an ambulant cubicle in accordance with AS 1428.1 must be provided for use by males and females.

The ambulant cubicles are required to be provided with the minimum circulation spaces and requirement stated in AS1428.1 2009 which includes:

- A width of 900-920mm and a clear width of not less than 900mm from the front of the pan to the cubicle door;
- A toilet pan with a seat height of 460-480mm and set out along the centre line of the cubicle;
- Grabrails at a height of 790-810mm and able to withstand a force of 1100 N applied at any position and in any direction without deformation or loosening or rotation of the fastenings or fittings;
- Doorways with a minimum clear width of 700mm;
- A 900x900mm circulation space to both sides of the cubicle doors and entry doors;
- Toilet paper holder and hooks set out as per the requirement of As1428.1 2009

Provide details of the toilets in the developed design drawings for review.

6.0 Services and Equipment

The following is a status of the services required to be provided to the building.

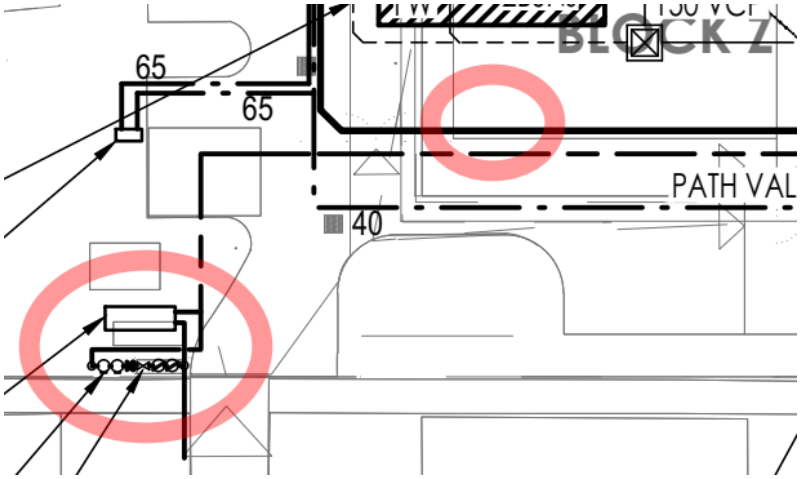
Fire Hydrants
The proposed building has a floor area more than 500m^2 and is required to be provided with fire hydrant system complying with the requirements of AS2419.1-2021 and BCA Clause E1D2.

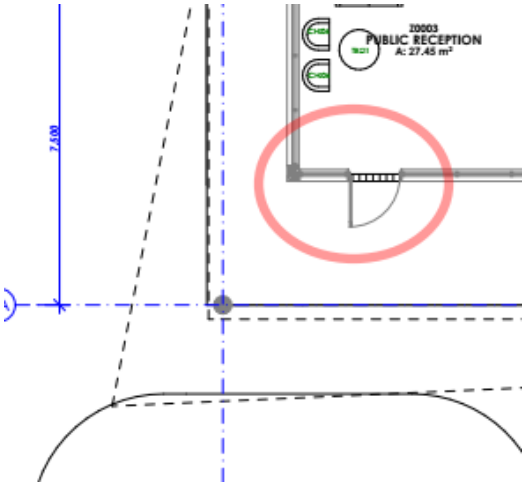
AS2419.1-2021 states that when the Fire Hydrant Booster is remote from the building it is required to be:

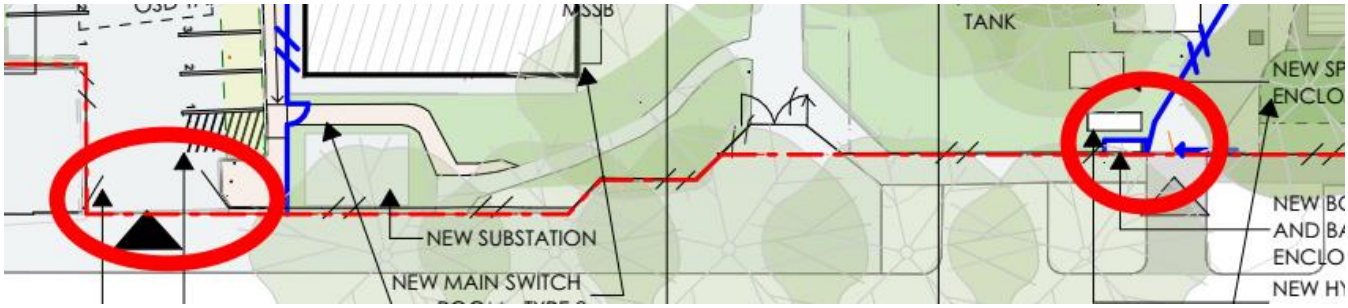
- Within sight of the principal pedestrian entrance to the building
- Adjacent to the site boundary and principal vehicle access for the fire brigade pumping appliance to the building or site.

Address: Suite 102, 12 Mount Street, North Sydney NSW 2060 | Email: admin@metrobc.com.au | Phone: (02) 9692 8477 | Fax: (02) 8209 4955

It appears that the fire hydrant booster is within sight of the principal pedestrian entrance to the proposed building but is not adjacent to the principal vehicle access. A fire engineering performance solution is proposed to address this non-compliance.



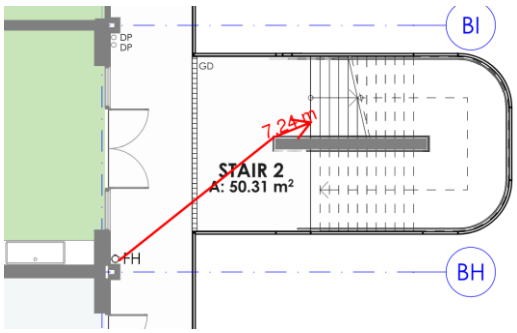


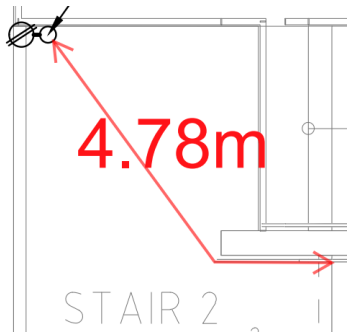


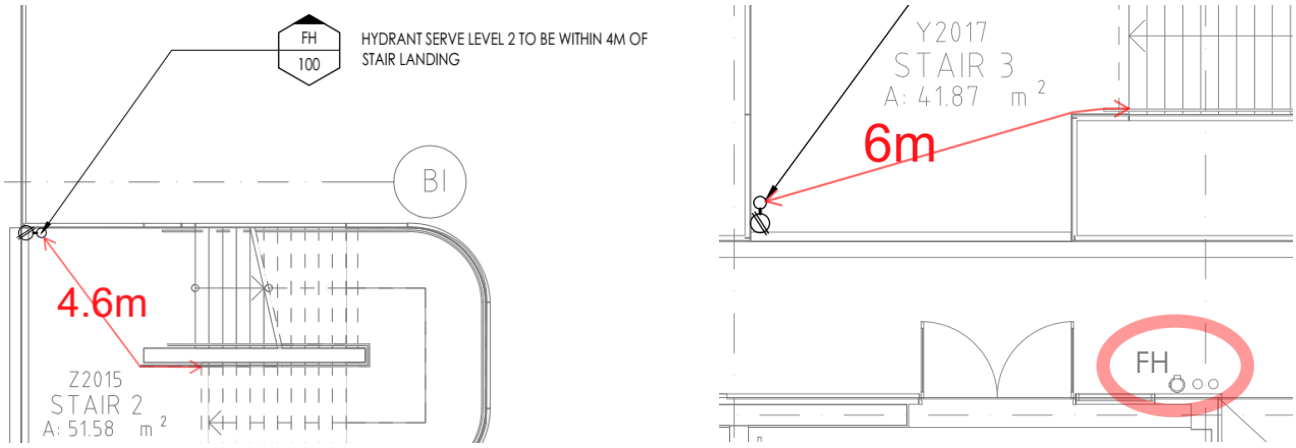
AS2419.1-2021 states that the Fire Hydrant Booster must also be protected from possible mechanical damage from vehicles. Provide details in the developed design drawings of this protection to the hydrant booster.

The internal fire hydrants are required to be located within 4m from exits and the exits on levels 1 to 3 are the top risers of the descending flight of the two external stairs and within the fire isolated stairs and on the ground floor they are the doors that open to the outside or at the construction edge of the building line.

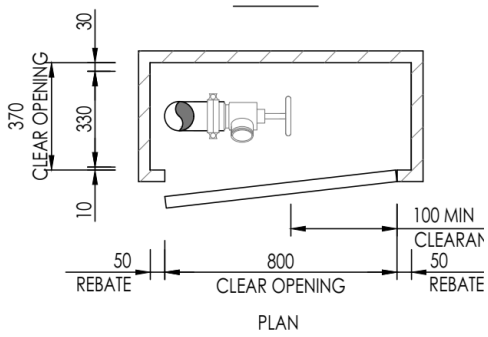
Currently the plans show that the internal fire hydrants are not within 4m of the exits and they show two locations for the fire hydrants and the drawings should be coordinated. The drawings note that the hydrants are to be within 4m of the stair landing but the requirement is that they need to be within 4m of the top of the descending flight of stairs as that is the exit.







Further details of the fire hydrant cupboards are required to be provided in the detailed design drawings for review so that the clearance requirements can be assessed.



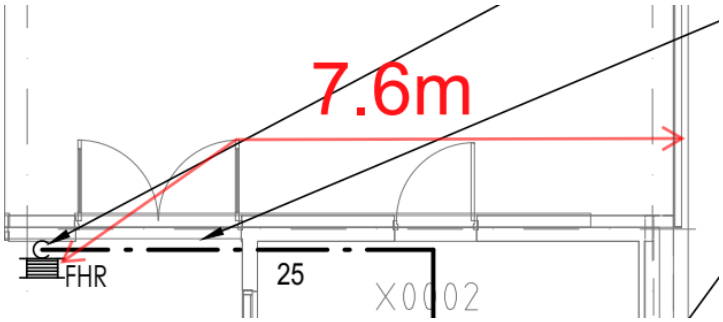
Please provide hydrant coverage plans for review.

Fire Hose-Reels

All classrooms and associated corridors in the Class 9b portions of the building and the Class 5 office parts of the building are not required to have fire hose reels. Any other area will require fire hose reel installed in accordance with BCA Clause E1D3 and AS2441-2005. The fire hose reels must be located within 4m of an exit.

Currently the FHR are not shown in the canteen store, administration office on the ground floor.

The FHR located by the northern exit from the gym is not located with 4m of the exit as the COLA roof means that the door is not the exit, the exit is the edge of the roof over the COLA. The FHR is required to be relocated to within 4m of the roof line.

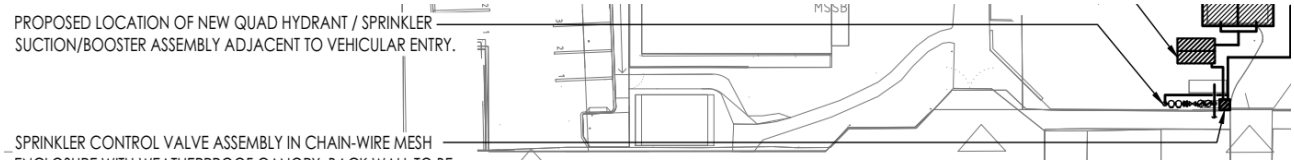


Please provide FHR coverage plans for review.

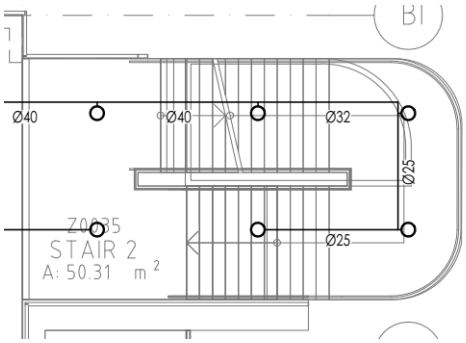
Sprinklers

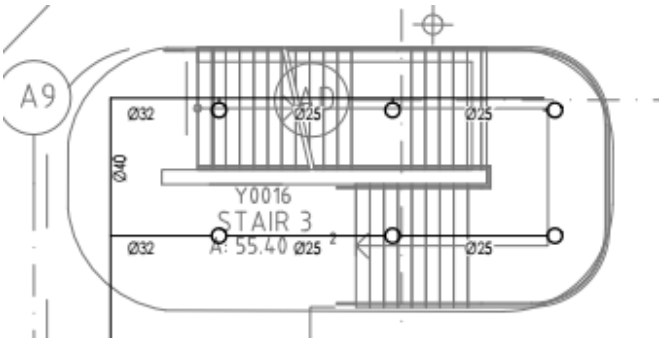
The proposed sprinkler system is required to comply with the requirements of the BCA and AS2118.1 2017

The typo in relation to the sprinkler booster be beside the vehicle entry should be modified on the next issue of the fire services drawings.

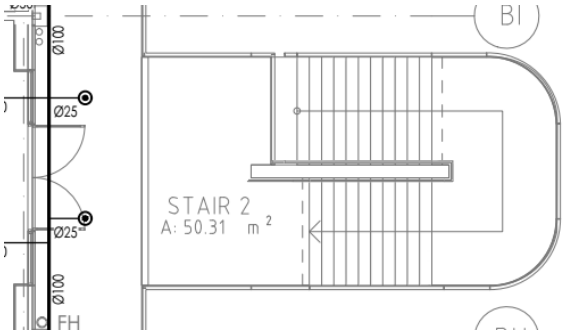


The sprinkler drawings are required to clarify that sprinklers are to be provided to the underside of the bottom flights of the two external stairs.

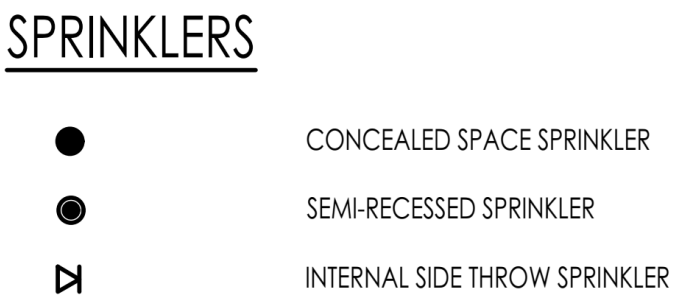




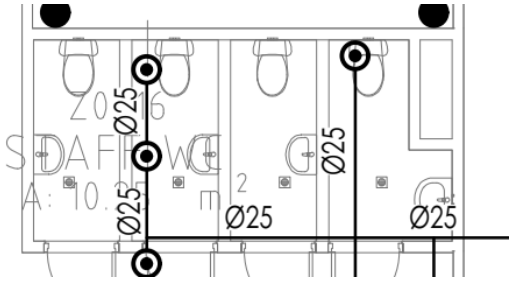
The sprinkler drawings are required to clarify that sprinklers are to be provided to the underside of the roof over the top of Stair 2.



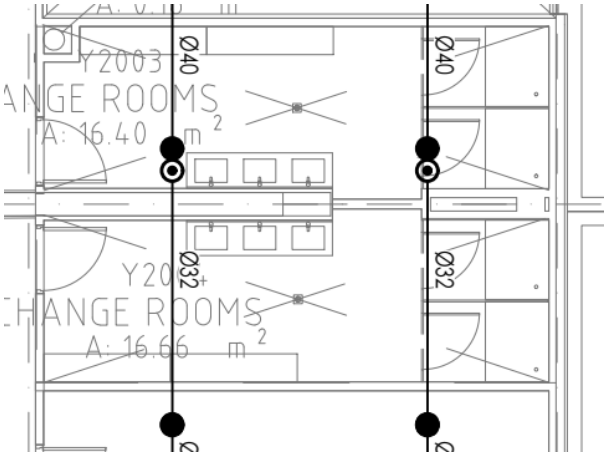
The legend is required to be updated to include an explanation of the type of sprinkler serving the stairs as it is not currently shown.



Sprinkler are required to be provided to all of the toilets on the ground floor.



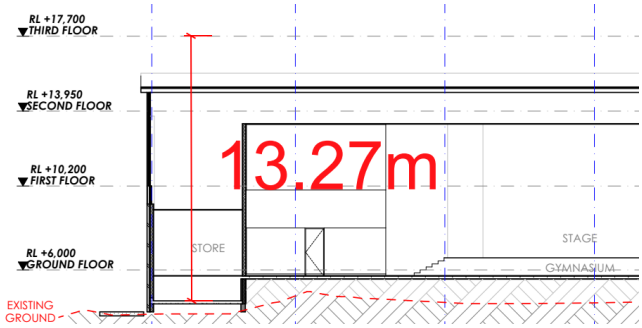
The next issue of the drawings are required to clarify the location of some of the sprinklers as they are not located in the room or space which they are intended to be located within.



Portable Fire Extinguishers
Portable fire extinguishers must be provided to all areas of new works in accordance with BCA Clause E1D14 and AS 2444 2001.

Fire precautions during construction
The BCA states that in a building under construction—
(a) not less than one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on each storey adjacent to each required exit or temporary stairway or exit; and
(b) after the building has reached an effective height of 12 m—
(i) the required fire hydrants and fire hose reels must be operational in at least every storey that is covered by the roof or the floor structure above, except the 2 uppermost storeys; and
(ii) any required booster connections must be installed.

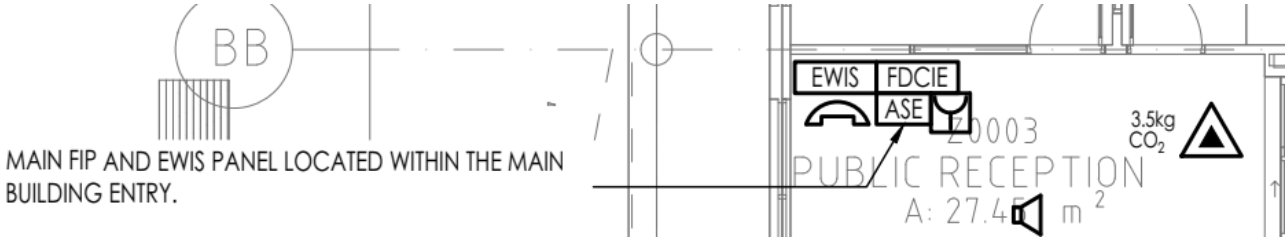
As the building has an effective height of more than 12m this requirement for an active hydrant system during construction applies.



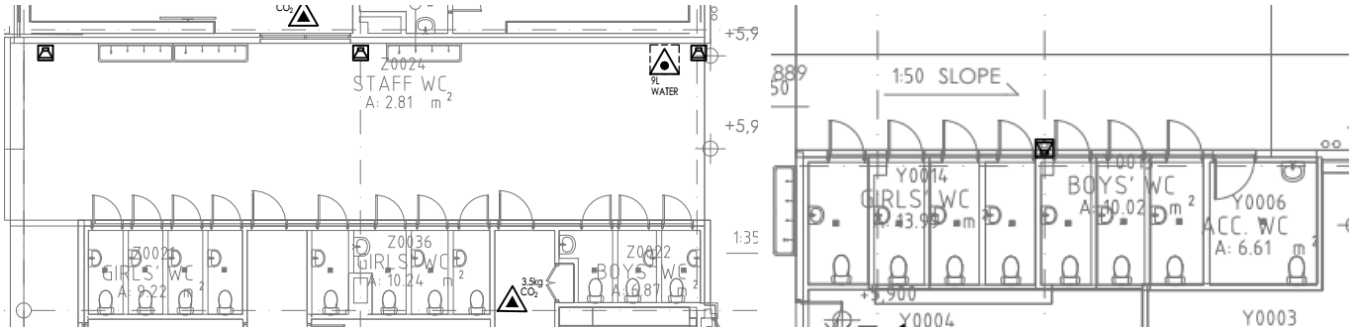
Smoke Detection

As the new high school building has a rise in storeys of more than 3 and is a class 9b building (school) it needs to be provided with an automatic smoke detection and alarm system complying with Specification 20 (AS1670.1 2018).

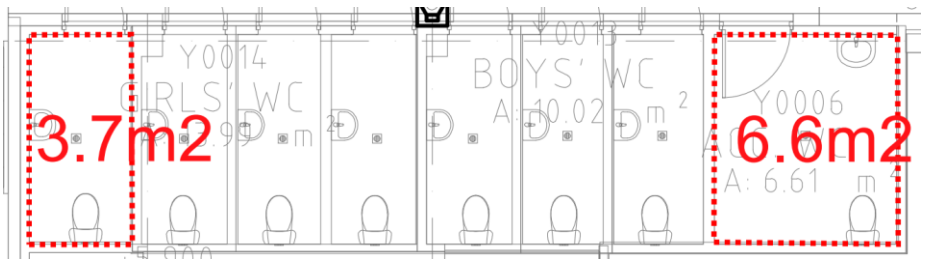
The FIP is required to be located at the designated building entry point which is the primary occupant entry point for the building as shown on the design drawings.



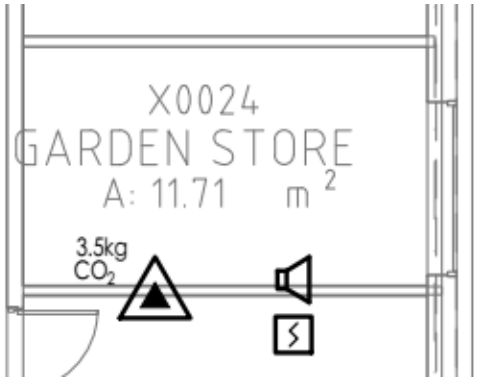
AS1670.1 2018 states that smoke detectors are not required to be provided with sanitary compartments if their floor area is less than 3.5m2 and they open off of a protected area. The fire services design is required to confirm if this concession applies to the ground floor toilet since the area that they open to is not a protected area.



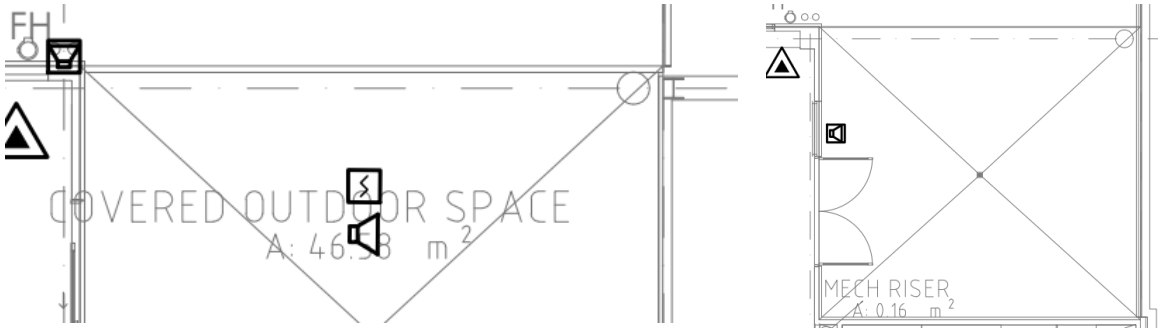
The western most girls toilet and the accessible wc on the ground floor have a floor area of more than 3.5m2 and are required to be provided with detection.



The next issue of the drawings are required to clarify the location of some of the detectors as they are not located in the room or space which they are intended to be located within.



The fire services designer should confirm if smoke detectors are suitable in the level 1 outdoor areas rather than thermal detectors due to false alarms from the external areas. The designer should also confirm if detection is required on the level 2 outdoor area as it may not be open enough to fall under the concession in clause 3.28(c) of the standard.



Smoke hazard management

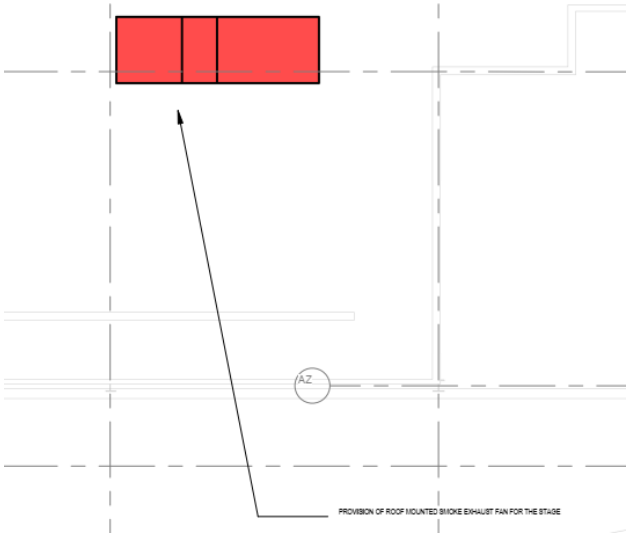
The NSW Variation of the BCA states that Class 9b assembly buildings are required to be provided with automatic shutdown of any air-handling system (other than non-ducted individual room units with a capacity not more than 1000 l/s and miscellaneous exhaust air systems installed in accordance with Sections 5 and 6 of AS 1668.1 2015) on the activation of smoke detectors installed complying with S20C6 any other installed fire detection and alarm system, including a sprinkler system.

BCA Clause S20C6 states that detectors must be spaced not more than 20m apart and not more than 10m from any wall, bulkhead or smoke curtain and have a sensitivity in accordance with AS1670.1 2018.

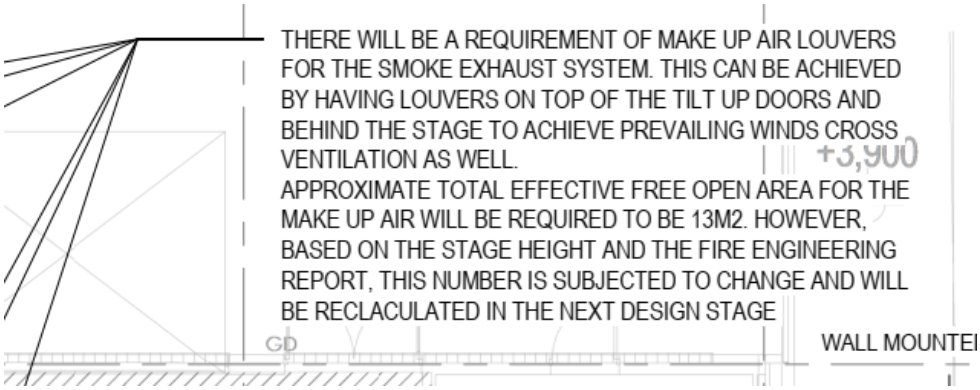
The BCA states that a building or part of a building used as an class 9b assembly building which has a stage with a floor area of more than 50 m2 and less than 150m2 must, over the stage, be provided with an automatic smoke exhaust system complying with Specification 21 (including Figure S21C2) or roof mounted automatic smoke-and-heat vents complying with NSW I4D59, in a single storey building or the top storey of a multi storey building. The stage has an area of 97.1m2.

If smoke and heat vents are specified and they are located on the roof over the stage this needs to be addressed in a fire engineered performance solution as the BCA requires them to be provided on the roof of the top storey i.e. level 3 roof.

The drawings show that smoke exhaust (ie not smoke and heat vents) is to be provided over the stage.



It is noted that M2002 states that lovers are required behind the stage for make up air but these are not shown on the architectural elevations.



BCA Specification 21 states that low level make up air is required to be provided however only high level make up air is proposed. This is required to be included in the design or in the FEBQ.

Smoke detection in accordance with Specification 20 provided to activate a smoke exhaust system or smoke-and-heat vents must be connected to a fire alarm monitoring system connected to a fire station or fire station dispatch centre in accordance with AS 1670.3 2018.

Lift

If the lift travels more than 12m, a stretcher facility must be provided that accommodates a raised stretcher with a patient lying on it horizontally by providing a clear space not less than 600mm wide x 2000mm long x 1400mm high above the floor level.

The lift is required to provided with the following:

- A lift floor dimension of not less than 1400 mm wide x 1600 mm deep where the lift travels more than 12m
- A lift floor dimensions of not less than 1100 mm wide x 1400 mm deep where the lift travel not more than 12m except a stairway platform lift
- Handrail complying with the provisions for a mandatory handrail in AS 1735.12.
- Passenger protection system complying with AS 1735.12.
- Lift car and landing control buttons complying with AS 1735.12
- Emergency hands-free communication, including a button that alerts a call centre of a problem and a light to signal that the call has been received.

Currently the lift does not travel more than 12m as it is 11.75m from the main ground floor (excluding the outdoor sports store) to level 3. See below extract from the services consultant advice confirming that the stretcher lift is not required.

NCC
- E3.2 Stretcher facility: not required as lift is not an emergency lift and lift travel <12m (Note
- E3.4 Emergency lift not required as effective height <25m

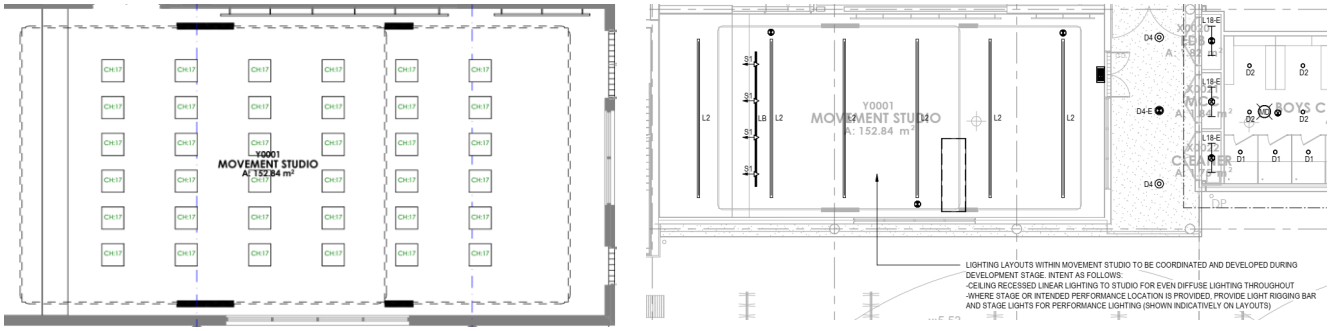
Lift fire service controls
If the lifts serve a storey above an effective height of 12 m, the following must be provided:
(a) A fire service recall control switch complying with BCA Clause E3D11 for—
(i) a group of lifts; or
(ii) a single lift not in a group that serves the storey.
(b) A lift car fire service drive control switch complying with BCA Clause E3D11 for every lift

Please note that the services consultants advice does not refer to the lift fire services controls and it should be revised to include a requirement for this. The lift does not travel more than 12m however the effective height of the building is more than 12m due to the sports store on the eastern façade being at a lower level.

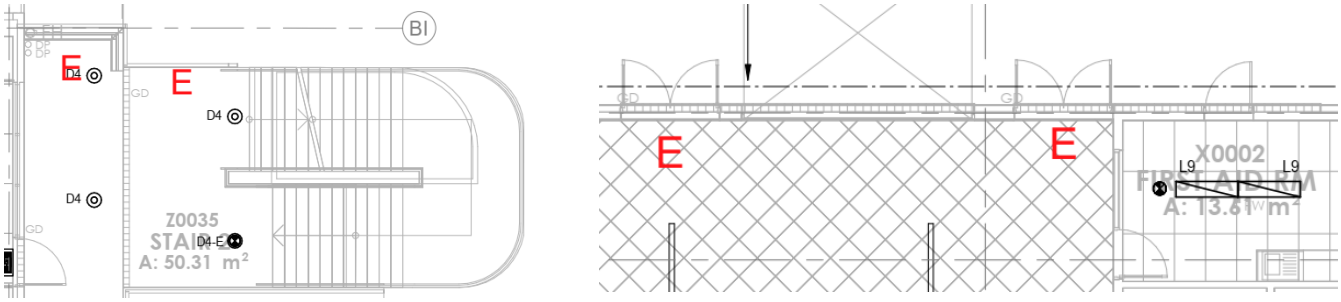
NCC
- E3.2 Stretcher facility: not required as lift is not an emergency lift and lift travel <12m (Note
- E3.4 Emergency lift not required as effective height <25m

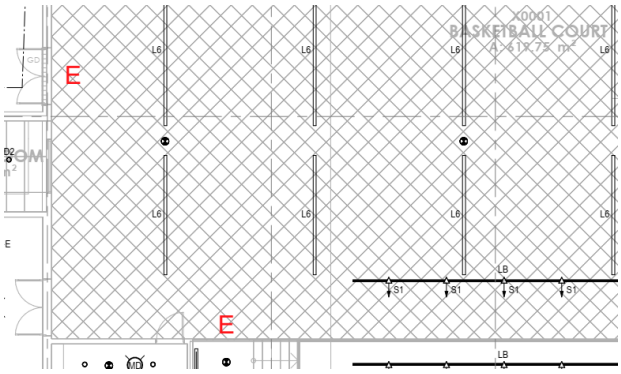
Emergency Lighting and Exit Signs
Exit signs and an emergency lighting system must be provided and must be in accordance with the BCA Clause E4D4 and AS 2293.1 2018.

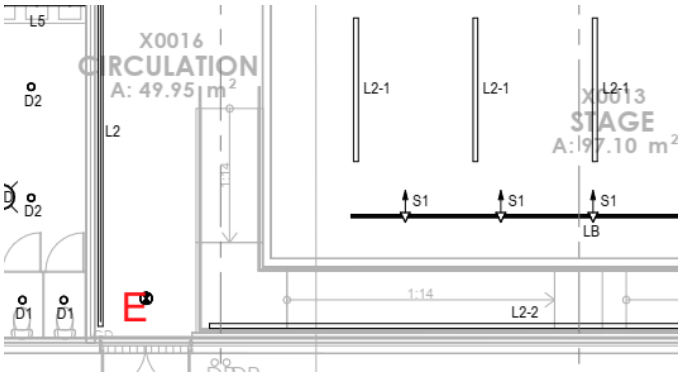
Please clarify what the dashed lines are around the perimeter of the ground level movement studio. If they are full height curtains the location of the exit signage is required to be coordinated so that the occupants can locate the openings in the curtains when egressing.



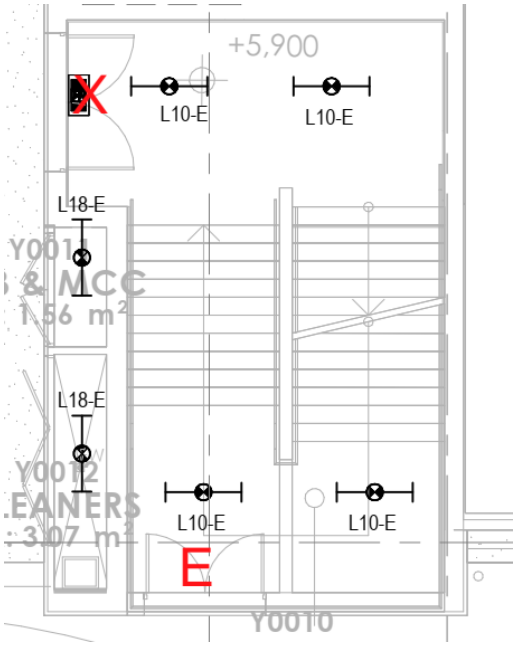
The electrical services drawings are required to be revised to show additional exit signs at the base of the external stairs. Note that the exact location is required to be coordinated with the fire engineer due to the discharge from stair 2 being within 6m of the external wall.







The exit sign at the base of Stair 1 over the double doors opposite the admin area is to be deleted and an exit sign if required to be located over the door opening from the southern side of the stairs to the outside.



EWIS
The BCA states that a Class 9b building used as a school with a rise in storeys of more than 3 is required to be provided with an emergency warning and intercommunication system (EWIS) in accordance with BCA Clause E4D9 and AS1670.4-2018.

7.0 Health and Amenity

Damp & weatherproofing
The external walls of the proposed building are required to comply with BCA Performance Requirement F3P1.

F3P1 is satisfied by complying with the new BCA requirements of F3D2 to F3D5 if the new BCA is used for this project. The external walls of the proposed building are required to comply with BCA Performance Requirement F3D5.

Where the external wall material does not have a Codemark Certificate a Performance Solution is required to be provided that demonstrates compliance with performance requirement F3P1 of the BCA. The performance solution is to be prepared by a person with appropriate and relevant experience and qualifications to undertake performance solutions in the field of weatherproofing.

Stormwater drainage
The proposed stormwater drainage is required to comply with AS/NZS 3500.3 2021. Hydraulic Engineer to note and incorporate into the design.

External above ground membranes
Waterproofing membranes for external above ground use must comply with AS 4654.1 2012 and AS 4654.2 2012.

Roof coverings
The proposed metal roof covering is required to comply with AS 1562.1 2018.

Sarking
Sarking-type material used for weatherproofing of the proposed roofs and walls must comply with AS/NZS 4200.1 2017 and AS 4200.2 2017.

Waterproofing of wet areas
Building elements in bathroom or shower room, a sink compartment, a laundry or sanitary compartment must—
(i) be *water resistant* or *waterproof* in accordance with BCA Specification 26; and
(ii) comply with AS 3740 2021.

Where a wall hung urinal is installed—
(i) the wall must be surfaced with impervious material extending from the floor to not less than 50 mm above the top of the urinal and not less than 225 mm on each side of the urinal.
(ii) the floor must be surfaced with impervious material and graded to a floor waste
In a room with timber or steel framed walls and containing a urinal—
(i) the wall must be surfaced with an impervious material extending from the floor to not less than 100 mm above the floor surface; and
(ii) the junction of the floor surface and the wall surface must be impervious.

Damp-proofing
Moisture from the ground must be prevented from reaching—
(i) the lowest floor timbers and the walls above the lowest floor joists; and
(ii) the walls above the damp-proof course; and
(iii) the underside of a suspended floor constructed of a material other than timber, and the supporting beams or girders.

Where a damp-proof course is provided, it must consist of—
(i) a material that complies with AS/NZS 2904 1995; or
(ii) impervious sheet material in accordance with AS 3660.1 2014.

Glazed assemblies
The following glazed assemblies in an external wall, must comply with AS 2047 2014 requirements for resistance to water penetration:

- Windows.
- Sliding and swinging glazed doors with a frame, including French and bi-fold doors with a frame.
- Adjustable louvres.
- Window walls with one-piece framing

The following glazed assemblies need not comply the requirements of this part:
i. All glazed assemblies not in an external wall.
ii. Fixed louvres.
iii. Skylights, roof lights and windows in other than the vertical plane.

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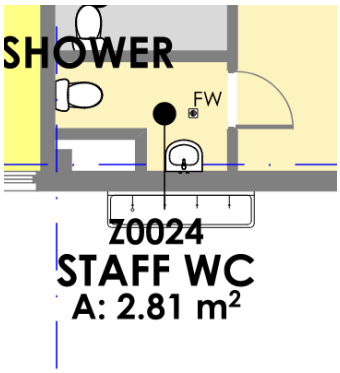
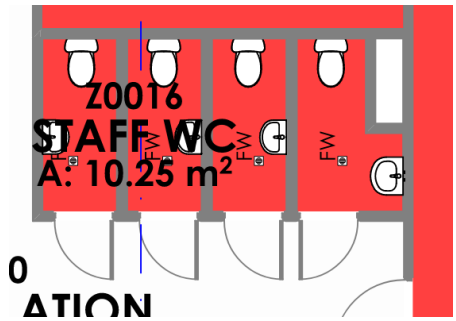
Toilets

Separate sanitary facilities for males and females must be provided to serve all persons at the school. Please confirm the final staff and student population so that an assessment of the number of facilities required for the male and female students and male and female staff can be made.

Please note that all toilets (except for accessible wc's) are required to be assigned as either male or female and are not permitted to be unisex such as the staff toilets on the ground floor.





Construction of sanitary compartments

Sanitary compartments must have doors and partitions that separate adjacent compartments and extend to a height of not less than 1.8m above the floor.

The door to a fully enclosed sanitary compartment must open outwards or slide or be readily removable from the outside of the sanitary compartment.

Room Heights

The BCA requires the room heights to be not less than:

1. Class 5 buildings 2.4m with the exception of corridors passageways and the like which permits 2.1m.
2. In a Class 9b building, a school classroom or other assembly building or part that accommodates not more than 100 people – 2.4m.
3. In a Class 9b building, a theatre, public hall or other assembly building, that accommodate more than 100 people – 2.7m.
4. A bathroom, shower room, sanitary compartment, other than an accessible adult change facility, airlock, tea
5. preparation room, pantry, store room, garage, car parking area, or the like — 2.1 m; and
6. A commercial kitchen — 2.4 m; and
7. Above a stairway, ramp, landing or the like — 2 m measured vertically above the nosing line of stairway treads or the floor surface of the ramp, landing or the like.

Light and Ventilation

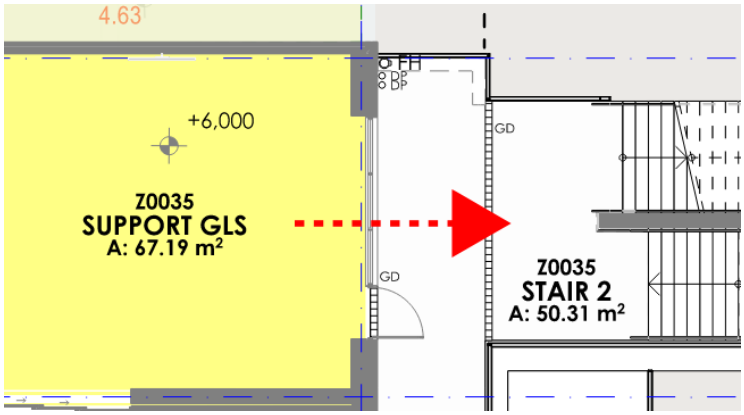
The BCA states that natural light complying with BCA clause F6D3 is required to be provided to all general-purpose classrooms in secondary schools.

Required natural light must be provided by windows that have an aggregate light transmitting area measured exclusive of framing members, glazing bars or other obstructions of not less than 10% of the floor area of the room and are open to the sky or face a court or other space open to the sky or an open verandah, carport or the like.

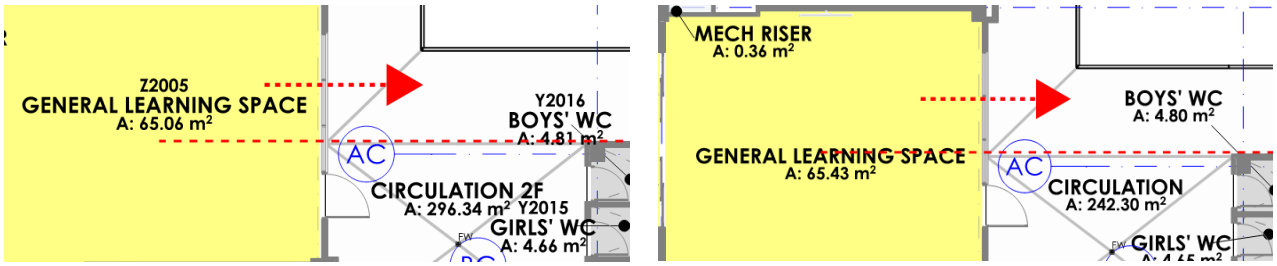
The windows on the western elevations are provided with louvres which may impact the required natural light transmitted through the windows and may not achieve compliance with the requirements of BCA Clause F6D3.

Provide additional details for review.

The window to Z0035 on ground level open to the enclosed corridor facing the egress stair and do not provide compliant natural light.



Only a portion of the windows in room GLS Z2005 & Z3005 on level 2 and 3 shown below face an open walkway and can provide compliant natural light. Provide details of the glazing for assessment.

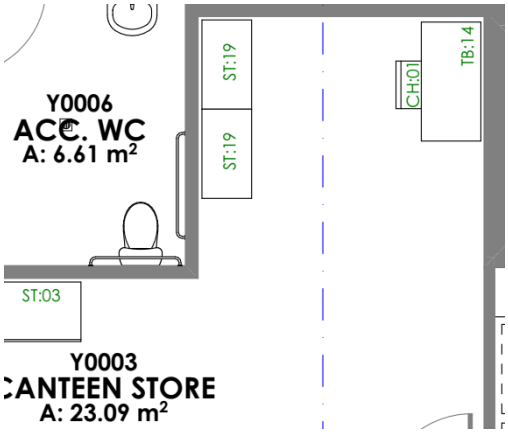


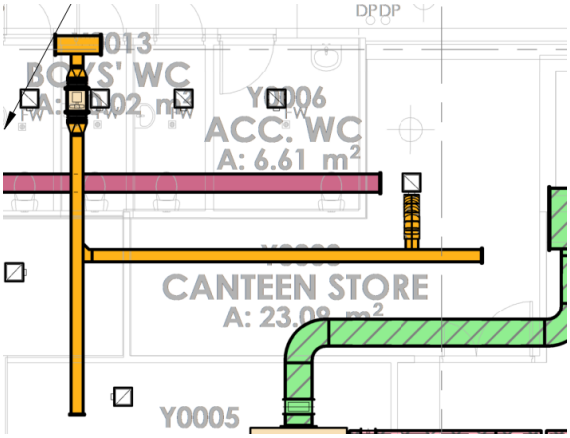
Artificial lighting must be provided to all rooms that are frequently occupied, all spaces required to be accessible, all corridors, lobbies, other circulation spaces and paths of egress. The artificial lighting system must comply with AS/NZS 1680.0-2009.

All areas of the buildings, except the store rooms, must be provided with natural ventilation complying with BCA Clause F4.6 or mechanical ventilation complying with AS 1668.2-2012. Natural ventilation requires an opening of size no less than 5% of the floor area of the room.

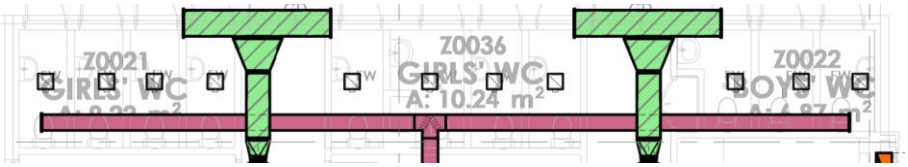
Natural ventilation to a room may come through a window, opening, door or other device from an adjoining room (including an enclosed verandah) if both rooms are within the same sole-occupancy unit or the enclosed verandah is common property, and the window, opening, door or other device has a ventilating area of not less than 10% of the floor area of the room to be ventilated, measured not more than 3.6 m above the floor; and the adjoining room has a window, opening, door or other device with a ventilating area of not less than 10% of the combined floor areas of both rooms.

The ground level canteen store is provided with a desk so it is assumed that it is also the office for the canteen staff and as such is required to be provided with ventilation however currently only exhaust air is provided.





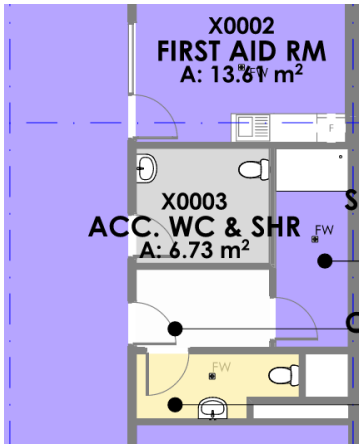
The developed design drawings are required to show how make up air is provided to the toilets provided with mechanical ventilation. See example below.

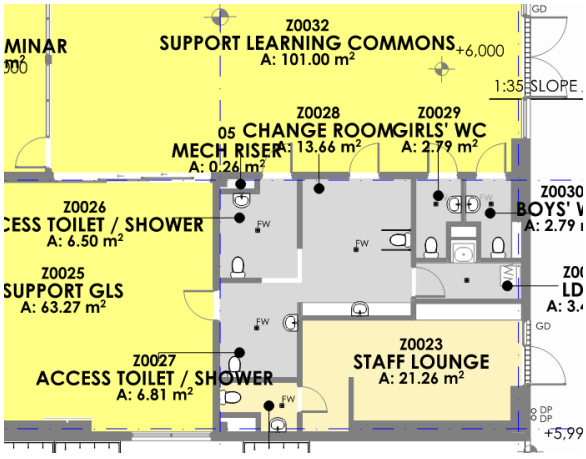


<u>Restriction on location of sanitary compartments</u>
The BCA states that toilets must not open directly into a room used for public assembly or a workplace normally occupied by more than one person.

The following sanitary compartments open directly to the following rooms –

a) Support learning commons room (Ground Floor); and
b) Support GLS (Z0025) (Ground Floor)
c) Gymnasium (Ground Floor)





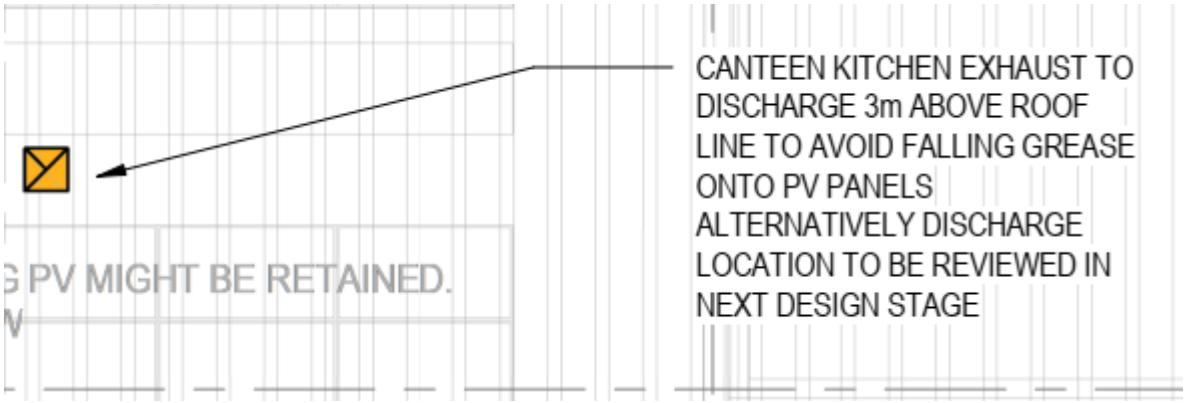
To achieve compliance, clause F6D9 of the BCA requires the sanitary compartment be provided with mechanical exhaust ventilation and the doorway to the room adequately screened from view.

Kitchen Exhaust
Any kitchens must be provided with a kitchen exhaust hood complying with AS/NZS 1668.1 2015 and AS 1668.2 2012 where:

(a) any cooking apparatus has—
(i) a total maximum electrical power input exceeding 8 kW; or
(ii) a total gas power input exceeding 29 MJ/h; or
(b)
(b) the total maximum power input to more than one apparatus exceeds—
(i) 0.5 kW electrical power; or
(ii) 1.8 MJ gas, per m2 of *floor area* of the room or enclosure.

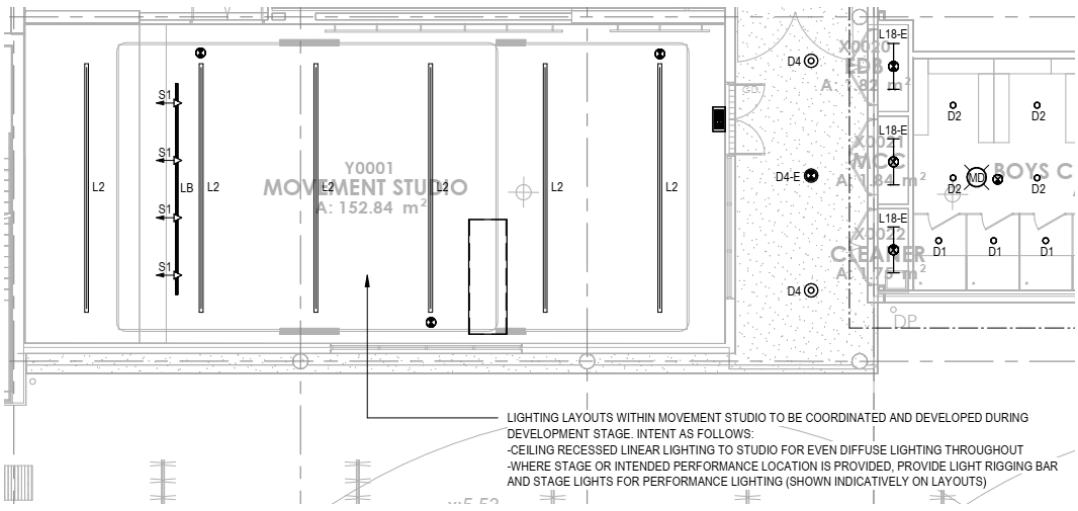
Please confirm the canteen total maximum power input to find out if kitchen exhausts are required.

Please note the requirement for the kitchen exhaust discharge to extend 3m above the roof of the Gym. This exhaust should be relocated if this 3m high extension of the exhaust is not preferred.



8.0 Special Use Buildings

It is assumed that the rigging bar mentioned on drawing E3000 for the movement studio is not a rigging loft. If it is then the BCA requirements of NSW Part I4 (and I1) will apply to the room. Provide further details of the rigging bar.



9.0 Energy Efficiency

The project is required to be designed to meet the NCC 2022 requirements and the projects design requirements, in terms of Energy-efficiency, will be designed to meet the new NCC 2022 requirements.

Building Fabric
The proposed building fabric (i.e. walls, ceiling, roof and floor), including glazing, is required to comply with the building fabric requirements of Part J4 of the Building Code of Australia.

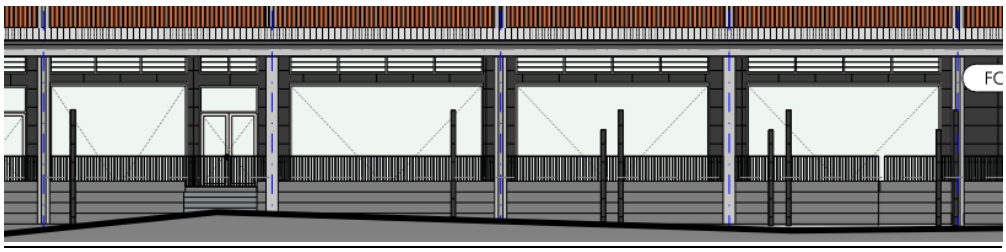
Energy Efficiency consultant to note and include details within a Part J report.

Building Sealing
The proposed openings in the building envelope are required to comply with the building sealing requirements of Part J5 of the Building Code of Australia.

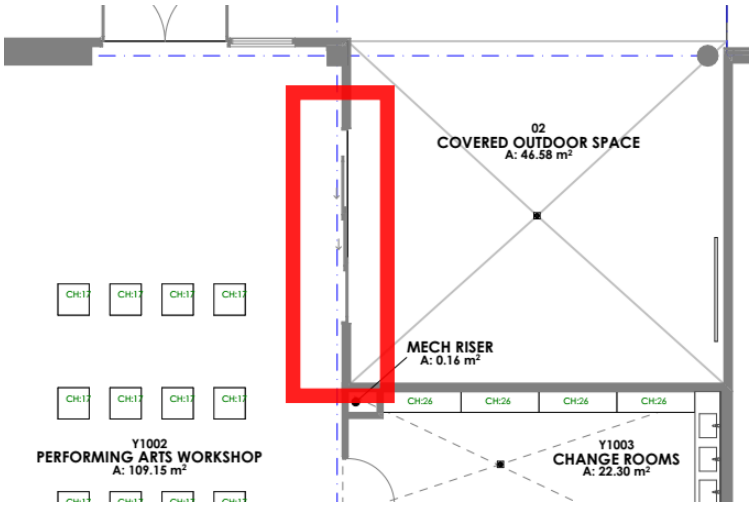
The BCA states that doors are required to be self closing in the building envelope. If proposed external doors are not self closing then a performance solution will be required from a Part J Consultant.

Please confirm if the hall & Canteen is to be a conditioned space, if it is the proposed tilt up doors are required to be addressed in a performance solution if they are not self closing.

Self-closing, for the purposes of Volume One, applied to a door, means equipped with a device which returns the door to the fully closed position immediately after each opening.



The sliding door on level 1 from the performing arts workshop to the outdoor space is required to be self closing. Please confirm if the proposed sliding door is an auto door and if not replace it with a self closing swing door.



Ventilation Systems, Artificial Lighting, Hot Water Supply
The design stage services consultants are required to ensure that the services comply with the requirements of Section J of the Building Code of Australia.

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Please note that BCA 2022 states the following in relation to facilities for electric vehicle charging equipment.

J9D4 Facilities for electric vehicle charging equipment
(1) Subject to (2), a carpark associated with a Class 2, 3, 5, 6, 7b, 8 or 9 building must be provided with electrical distribution boards dedicated to electric vehicle charging—
(a) in accordance with Table J9D4 in each storey of the carpark; and
(b) labelled to indicate use for electric vehicle charging equipment.
(2) Electrical distribution boards dedicated to serving electric vehicle charging in a carpark must—
(a) be fitted with a charging control system with the ability to manage and schedule charging of electric vehicles in response to total building demand; and
(b) when associated with a Class 2 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 11:00 pm to 7:00 am daily; and
(c) when associated with a Class 5 to 9 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 9:00 am to 5:00 pm daily; and
(d) when associated with a Class 3 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 48 kWh from 11:00 pm to 7:00 am daily; and
(e) be sized to support the future installation of a 7 kW (32 A) type 2 electric vehicle charger in—
(i) 100% of the car parking spaces associated with a Class 2 building; or
(ii) 10% of car parking spaces associated with a Class 5 or 6 building; or
(iii) 20% of car parking spaces associated with a Class 3, 7b, 8 or 9 building; and
(f) contain space of at least 36 mm width of DIN rail per outgoing circuit for individual sub-circuit electricity metering to record electricity use of electric vehicle charging equipment; and
(g) be labelled to indicate the use of the space required by (f) is for the future installation of metering equipment.

All services consultants to note and include details of compliance within their design.

10.0 Performance Solutions

The following is a list of compliance requirements that will potentially require a Performance Solution:

- If the exposure created by the internal boundaries to the external walls of the proposed building are not addressed by providing the required FRL to the proposed walls the lack of FRL may be able to be addressed in a fire engineered performance solution.

- The lack of self closing fire rated doors to the existing openings in Building F may be able to be addressed in a fire engineered performance solution if the walls are loadbearing and have an FRL of 120/120/120.

- The travel distance between the alternative exits through the point of choice is estimated to be more than 60m. This may be able to be addressed in a fire engineered performance solution.

- Stair 2 is proposed to be designed as D1.8 external stairs in lieu of fire isolated stairs. The BCA requires walls within 6m of the stairs to have an FRL of 60/60/60 and if this is not achieved it is required to be addressed in an FER. The BCA does not permit door and window openings to be within 3m of the stairs and requires window and door openings within 3m to 6m of the stairs to be protected (eg fire doors, drenchers on windows etc) and if the design does not comply with these requirements it is required to be addressed in an FER. Currently there is no details regarding the provision of an FRL to the walls or protection to the openings but this will be clarified as the design is developed.

- A fire engineered performance solution will be required to justify the location of the fire hydrant booster as it will not be technically located adjacent to the principal vehicular access to the site.

- If the pedestrian path from Crane Street is a main point of pedestrian entry at the allotment boundary to the new high school building and is not being modified to be accessible it will be required to be discussed with an access consultant for possible inclusion in a performance solution. Please note that the access consultant may not be able to justify the lack of disabled access and that the path may have to be made accessible.

- This report also states that the external walls of buildings need to comply with the weatherproofing requirements and there is no DTS clause to achieve compliance. The BCA permits the use of products that have a Codemark Certificate confirming compliance to F3P1 but where a product is specified that does not have this Codemark Certificate then a Performance Solution is required to be provided confirming how compliance is achieved.

- The screens / louvers over the windows may reduce the amount of natural light to less than the DTS minimum and if so the design is required to be addressed in a performance solution. Further details are required to be provided to assess this.

- If the natural light to the general learning spaces is not provided as per the BCA DTS requirements it is required to be addressed in a performance solution.

- If the sanitary compartments open directly to rooms and are not provided with mechanical exhaust ventilation and the doorway to the room not adequately screened from view they will need to be addressed in a performance solution.

- If the sliding door on level 1 from the performing arts workshop to the outdoor space is not replaced with a self closing swing door it is required to be addressed in a performance solution.

11.0 Conclusion

The design documentation provided to date has been assessed in respect to the deemed to satisfy provisions of the Building Code of Australia 2022 excluding Section B structure, NSW Part I4 entertainment venues and Section J energy efficiency.

Further analysis throughout design progression will be caried out prior to the completion of the design.

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APPENDIX A – TYPE A CONSTRUCTION REQUIREMENTS

The following table lists the fire resistance levels (FRL) required for the proposed building.

Building element	**Class of building — FRL: (in minutes)** ***Structural adequacy*****/*****Integrity*****/*****Insulation***			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 8**
EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—				
For *loadbearing* parts—				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 60	120/ 90/ 90	180/180/120	240/240/180
3 m or more	90/ 60/ 30	120/ 60/ 30	180/120/ 90	240/180/ 90
For non-*loadbearing* parts—				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 60	–/ 90/ 90	–/180/120	–/240/180
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*—				
For *loadbearing* columns—	90/–/–	120/–/–	180/–/–	240/–/–
For non-*loadbearing* columns—	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
Fire-resisting lift and stair *shafts*—				
Loadbearing	90/ 90/ 90	120/120/120	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding *public corridors*, public lobbies and the like—				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Ventilating, pipe, garbage, and like *shafts* not used for the discharge of hot products of combustion—				
Loadbearing	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/ 90/ 90	–/120/120	–/120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES				
and COLUMNS—	90/–/–	120/–/–	180/–/–	240/–/–
FLOORS	90/ 90/ 90	120/120/120	180/180/180	240/240/240
ROOFS	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60

APPENDIX B – EXTERNAL STAIRWAYS IN LIEU OF FIRE-ISOLATED EXITS

The following extracts from the BCA Guide state the two options for the requirements for the High School Building external stairs (exits).

Figure D1.8(1) Protection of the external exit using the external wall of the building in accordance with D1.8(c)(i)

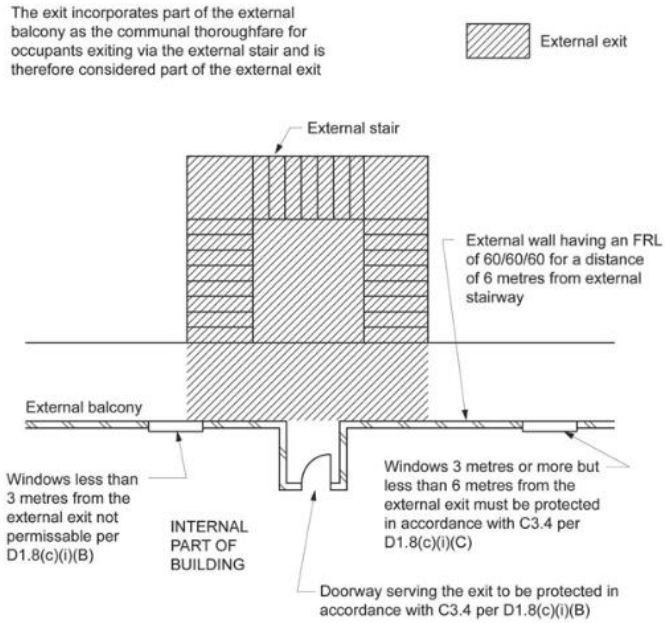
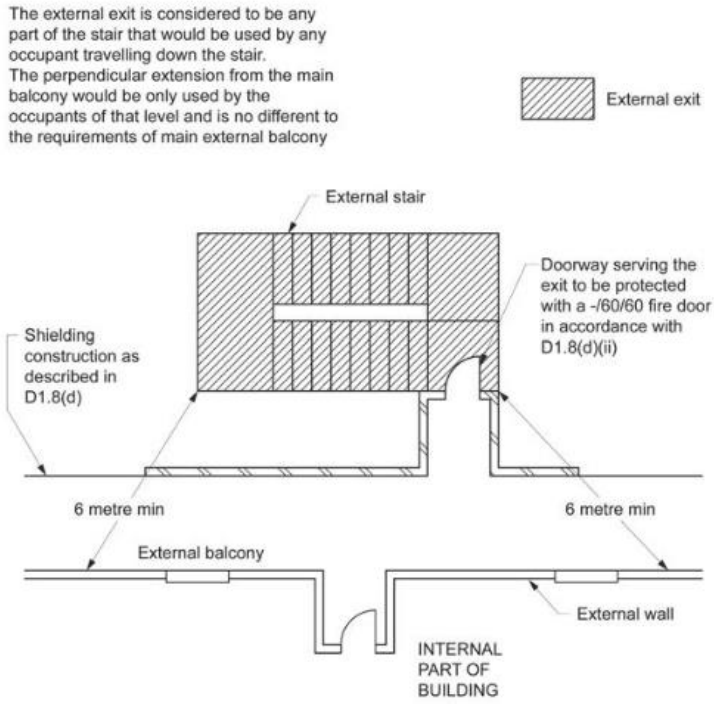


Figure D1.8(2) Protection of the external exit using shielding construction in accordance with D1.8(c)(ii)



APPENDIX C – DRAWINGS REVIEWED

Architectural drawings prepared by JDH Architects

Title	Drawing Number	Revision	Date
1. Drawing, Schedule & Legend And Symbols	CHS-JDH-0001-XX-XX-DR-A-S3	P15	6/04/2023
2. Demolition Site Plan	CHS-JDH-0012-ZZ-XX-DR-A-S3	P15	6/04/2023
3. Proposed Site Plan	CHS-JDH-0013-ZZ-XX-DR-A-S3	P15	6/04/2023
4. Staging Plan	CHS-JDH-0014-ZZ-XX-DR-A-S3	P15	6/04/2023
5. General arrangement – Ground Floor plan	CHS-JDH-0101-ZZ-R0-DR-A-S3	P15	6/04/2023
6. General Arrangement - First Floor Plan	CHS-JDH-0102-ZZ-R1-DR-A-S3	P15	6/04/2023
7. General Arrangement - Second Floor Plan	CHS-JDH-0103-ZZ-R2-DR-A-S3	P15	6/04/2023
8. General Arrangement - Third Floor Plan	CHS-JDH-0104-ZZ-R3-DR-A-S3	P15	6/04/2023
9. General Arrangement – Roof floor plan	CHS-JDH-0105-ZZ-R4-DR-A-S3	P15	6/04/2023
10. General arrangement - Refurb Plan	CHS-JDH-0106-ZZ-ZZ-DR-A-S3	P15	6/04/2023
11. General arrangement – Amenities plan	CHS-JDH-0107-ZZ-ZZ-DR-A-S3	P15	6/04/2023
12. General arrangement – Joint use plan	CHS-JDH-0108-ZZ-R0-DR-A-S3	P15	6/04/2023
13. Ground Floor Plan - Sheet 1	CHS-JDH-0121-ZZ-R0-DR-A-S3	P15	6/04/2023
14. Ground Floor Plan - Sheet 2	CHS-JDH-0122-ZZ-R0-DR-A-S3	P15	6/04/2023
15. Ground Floor Plan - Sheet 3	CHS-JDH-0123-ZZ-R0-DR-A-S3	P15	6/04/2023
16. Ground Floor Plan - Sheet 4	CHS-JDH-0124-ZZ-R0-DR-A-S3	P15	6/04/2023
17. First Floor Plan - Sheet 1	CHS-JDH-0131-ZZ-R1-DR-A-S3	P15	6/04/2023
18. First Floor Plan - Sheet 2	CHS-JDH-0132-ZZ-R1-DR-A-S3	P15	6/04/2023
19. First Floor Plan - Sheet 3	CHS-JDH-0163-ZZ-R4-DR-A-S3	P15	6/04/2023
20. Second Floor Plan - Sheet 1	CHS-JDH-0141-ZZ-R2-DR-A-S3	P15	6/04/2023
21. Second Floor Plan – Sheet 2	CHS-JDH-0142-ZZ-R2-DR-A-S3	P15	6/04/2023
22. Third Floor Plan - Sheet 1	CHS-JDH-0151-ZZ-R3-DR-A-S3	P15	6/04/2023
23. Third Floor Plan - Sheet 2	CHS-JDH-0152-ZZ-R3-DR-A-S3	P15	6/04/2023
24. Roof Plan - Sheet 1	CHS-JDH-0161-ZZ-R4-DR-A-S3	P15	6/04/2023
25. Roof Plan - Sheet 2	CHS-JDH-0162-ZZ-R4-DR-A-S3	P15	6/04/2023
26. Roof Plan - Sheet 3	CHS-JDH-0163-ZZ-R4-DR-A-S3	P15	6/04/2023
27. Ground Floor Concrete Setout Plan - Sheet 1	CHS-JDH-0201-ZZ-R0-DR-A-S3	P15	6/04/2023
28. Ground Floor Concrete Setout Plan - Sheet 2	CHS-JDH-0202-ZZ-R0-DR-A-S3	P15	6/04/2023
29. Ground Floor Concrete Setout Plan - Sheet 3	CHS-JDH-0203-ZZ-R0-DR-A-S3	P15	6/04/2023
30. First Floor Concrete Setout Plan - Sheet 1	CHS-JDH-0211-ZZ-R1-DR-A-S3	P15	6/04/2023
31. First Floor Concrete Setout Plan - Sheet 2	CHS-JDH-0221-ZZ-R2-DR-A-S3	P15	6/04/2023
32. Second Floor Concrete Setout Plan - Sheet 1	CHS-JDH-0221-ZZ-R2-DR-A-S3	P15	6/04/2023
33. Second Floor Concrete Setout Plan - Sheet 2	CHS-JDH-0222-ZZ-R2-DR-A-S3	P15	6/04/2023
34. Third Floor Concrete Setout Plan - Sheet 1	CHS-JDH-0231-ZZ-R3-DR-A-S3	P15	6/04/2023
35. Third Floor Concrete Setout Plan – Sheet 2	CHS-JDH-0232-ZZ-R3-DR-A-S3	P15	6/04/2023
36. Ground floor RCP – Sheet 1	CHS-JDH-0301-ZZ-R0-DR-A-S3	P15	6/04/2023
37. Ground floor RCP – Sheet 2	CHS-JDH-0302-ZZ-R0-DR-A-S3	P15	6/04/2023
38. Ground floor RCP – Sheet 3	CHS-JDH-0303-ZZ-R0-DR-A-S3	P15	6/04/2023
39. First floor RCP – Sheet 1	CHS-JDH-0311-ZZ-R1-DR-A-S3	P15	6/04/2023
40. First floor RCP – Sheet 2	CHS-JDH-0312-ZZ-R1-DR-A-S3	P15	6/04/2023
41. First floor RCP – Sheet 3	CHS-JDH-0313-ZZ-R1-DR-A-S3	P15	6/04/2023
42. Second floor RCP – Sheet 1	CHS-JDH-0321-ZZ-R2-DR-A-S3	P15	6/04/2023

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Architectural drawings prepared by JDH Architects (Continued)

Title	Drawing Number	Revision	Date
43. Second floor RCP – Sheet 2	CHS-JDH-0322-ZZ-R2-DR-A-S3	P15	6/04/2023
44. Third floor RCP – Sheet 1	CHS-JDH-0331-ZZ-R3-DR-A-S3	P15	6/04/2023
45. Third floor RCP – Sheet 2	CHS-JDH-0332-ZZ-R3-DR-A-S3	P15	6/04/2023
46. Ground Floor FF - Sheet 1	CHS-JDH-0401-ZZ-R0-DR-A-S3	P15	6/04/2023
47. Ground Floor FF - Sheet 2	CHS-JDH-0402-ZZ-R0-DR-A-S3	P15	6/04/2023
48. Ground Floor FF - Sheet 3	CHS-JDH-0403-ZZ-R0-DR-A-S3	P15	6/04/2023
49. First FLOOR FF - SHEET 1	CHS-JDH-0411-ZZ-R1-DR-A-S3	P15	6/04/2023
50. First FLOOR FF - SHEET 2	CHS-JDH-0412-ZZ-R1-DR-A-S3	P15	6/04/2023
51. First FLOOR FF - SHEET 3	CHS-JDH-0413-ZZ-R1-DR-A-S3	P15	6/04/2023
52. Second FLOOR FF - SHEET 1	CHS-JDH-0421-ZZ-R2-DR-A-S3	P15	6/04/2023
53. Second FLOOR FF - SHEET 2	CHS-JDH-0422-ZZ-R2-DR-A-S3	P15	6/04/2023
54. Third Floor FF - Sheet 1	CHS-JDH-0431-ZZ-R3-DR-A-S3	P15	6/04/2023
55. Third Floor FF- Sheet 2	CHS-JDH-0432-ZZ-R3-DR-A-S3	P15	6/04/2023
56. Elevations	CHS-JDH-0501-ZZ-ZZ-DR-A-S3	P15	6/04/2023
57. IE Typical GLS, Learning, Commons, Seminar	CHS-JDH-0531-B1-ZZ-DR-A-S3	P15	6/04/2023
58. IE Fitness Laboratory	CHS-JDH-0541-B1-R1-DR-A-S3	P15	6/04/2023
59. IE Staff Lounge	CHS-JDH-0551-B1-R1-DR-A-S3	P15	6/04/2023
60. IE Clerical, Public Reception, Staff Interview	CHS-JDH-0561-B1-R0-DR-A-S3	P15	6/04/2023
61. IE Student Reception, Canteen	CHS-JDH-0562-B1-R0-DR-A-S3	P15	6/04/2023
62. Performing Arts Workshop, Movement Studio	CHS-JDH-0571-B2-R1-DR-A-S3	P15	6/04/2023
63. IE Hall Sheet 01	CHS-JDH-0581-B3-R0-DR-A-S3	P15	6/04/2023
64. IE Hall Sheet 02	CHS-JDH-0582-B3-R0-DR-A-S3	P15	6/04/2023
65. Section Detail Sheet 1	CHS-JDH-0901-B1-ZZ-DR-A-S3	P15	6/04/2023
66. Section Detail Sheet 2	CHS-JDH-0902-B1-ZZ-DR-A-S3	P15	6/04/2023
67. Section Detail Sheet 3	CHS-JDH-0903-B1-ZZ-DR-A-S3	P15	6/04/2023
68. Section Detail Sheet 4	CHS-JDH-0904-B1-ZZ-DR-A-S3	P15	6/04/2023
69. Section Detail Sheet 5	CHS-JDH-0905-B1-ZZ-DR-A-S3	P15	6/04/2023
70. Section Detail Sheet 6	CHS-JDH-0906-B1-ZZ-DR-A-S3	P15	6/04/2023
71. Section Detail Sheet 7	CHS-JDH-0907-B1-ZZ-DR-A-S3	P15	6/04/2023
72. Section Detail Sheet 8	CHS-JDH-0908-B1-ZZ-DR-A-S3	P15	6/04/2023

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Structural drawings prepared by Woollacott's Consulting Engineers

Title	Drawing Number	Revision	Date
73. Standard Notes And Drawing List	S001	P4	30/032023
74. Footing Plan - Sheet 1	S010	P4	30/03/2023
75. Footing Plan - Sheet 2	S011	P4	30/032023
76. Footing Plan - Sheet 3	S012	P4	30/03/2023
77. Ground Floor - Sheet 1	S101	P4	30/032023
78. Ground Floor - Sheet 2	S102	P4	30/03/2023
79. Ground Floor - Sheet 3	S103	P4	30/032023
80. Ground Floor Sections And Details	S111	P4	30/03/2023
81. Level 1 - Sheet 1	S201	P4	30/032023
82. Level 1 - Sheet 2	S202	P4	30/03/2023
83. Level 1 - Sheet 3	S203	P4	30/032023
84. Level 2 - Sheet 1	S301	P4	30/03/2023
85. Level 2 - Sheet 2	S302	P4	30/03/2023
86. Level 3 - Sheet 1	S401	P4	30/03/2023
87. Level 3 - Sheet 2	S402	P4	30/032023
88. Roof Plan - Sheet 1	S501	P4	30/03/2023
89. Roof Plan - Sheet 2	S502	P4	30/03/2023
90. Roof Plan - Sheet 3	S503	P4	30/03/2023
91. Cover Page – Concord HS Upgrade	22-108	A	31/03/2023

Civil drawings prepared by Woollacott's Consulting Engineers

Title	Drawing Number	Revision	Date
92. Key Plan, Standard Notes And Drawing List	C001	P2	30/032023
93. Civil Works Details - Sheet 1	C002	P2	30/03/2023
94. Civil Works Details - Sheet 2	C003	P2	30/03/2023
95. Civil Works Plan - Sheet 1	C101	P2	30/03/2023
96. Civil Works Plan - Sheet 2	C102	P2	30/032023
97. Civil Works Plan - Sheet 3	C103	P2	30/03/2023
98. Erosion And Sediment Control Plan	C201	P2	30/03/2023
99. Erosion And Sediment Control Details	C202	P2	30/03/2023
100. Bulk Earthwork Plan	C301	P2	03/04/2023
101. Cover Page	22-108	P2	30/03/2023

Fire drawings prepared by Erbas

Title	Drawing Number	Revision	Date
102. Fire Services Cover Sheet, Notes, Legend, Symbols And Drawing Schedule	SYD22247-F000	P4	30/032023
103. Fire Services Site Plan	SYD22247-F001	P4	30/03/2023
104. Fire Services Ground Floor Fire Detection Layout	SYD22247-F100	P5	30/03/2023
105. Fire Services First Floor Fire Detection Layout	SYD22247-F101	P4	30/03/2023
106. Fire Services Second Floor Fire Detection Layout	SYD22247-F102	P4	30/032023
107. Fire Services Third Floor Fire Detection Layout	SYD22247-F103	P4	30/03/2023
108. Fire Services Ground Floor Sprinkler Layout	SYD22247-F200	P3	30/03/2023
109. Fire Services First Floor Sprinkler Layout	SYD22247-F201	P3	30/03/2023
110. Fire Services Second Floor Sprinkler Layout	SYD22247-F202	P3	03/04/2023
111. Fire Services Third Floor Sprinkler Layout	SYD22247-F203	P3	30/03/2023

Hydraulic drawings prepared by Erbas

Title	Drawing Number	Revision	Date
112. Hydraulic Services Cover Sheet, Notes, Legend, Symbols, And Drawings Schedule	SYD22247-H000	P6	30/032023
113. Hydraulic Services Site Plan Drainage Layout	SYD22247-H001	P7	30/03/2023
114. Hydraulic Services Asset Protection Plan	SYD22247-H002	P4	30/03/2023
115. Hydraulic Services Ground Floor Drainage Layout	SYD22247-H100	P7	30/03/2023
116. Hydraulic Services First Floor Drainage Layout	SYD22247-H101	P7	30/032023
117. Hydraulic Services Second Floor Drainage Layout	SYD22247-H102	P7	30/03/2023
118. Hydraulic Services Third Floor Drainage Layout	SYD22247-H103	P7	30/03/2023
119. Hydraulic Services Roof Drainage Layout	SYD22247-H104	P7	30/03/2023
120. Hydraulic Services Ground Floor Pressure Services Layout	SYD22247-H200	P7	30/03/2023
121. Hydraulic Services First Floor Pressure Services Layout	SYD22247-H201	P7	30/03/2023
122. Hydraulic Services Second Floor Pressure Services Layout	SYD22247-H202	P7	30/03/2023
123. Hydraulic Services Third Floor Pressure Services Layout	SYD22247-H203	P7	30/03/2023
124. Hydraulic Services Typical Details	SYD22247-H300	P6	30/03/2023

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Mechanical drawings prepared by Steensen Varming

Title	Drawing Number	Revision	Date
125. Cover Sheet	CHS-SV-XX-R0-DR-MS-M-1000-S3	3	30/032023
126. Standard Details -Sheet 1	CHS-SV-XX-R0-DR-MS-M-1003-S3	3	30/03/2023
127. Standard Details -Sheet 2	CHS-SV-XX-R0-DR-MS-M-1004-S3	3	30/03/2023
128. Standard Details -Sheet 3	CHS-SV-XX-R0-DR-MS-M-1005-S3	3	30/03/2023
129. Mechanical Site Plan	CHS-SV-XX-R0-DR-MS-M-1010-S3	1	30/032023
130. Ground Floor HVAC Layout -Sheet 1	CHS-SV-XX-R0-DR-MS-M-2000-S3	3	30/03/2023
131. Ground Floor HVAC Layout -Sheet 2	CHS-SV-XX-R0-DR-MS-M-2001-S3	3	30/03/2023
132. Ground Floor HVAC Layout -Sheet 3	CHS-SV-XX-R0-DR-MS-M-2002-S3	3	30/03/2023
133. First Floor HVAC Layout -Sheet 1	CHS-SV-XX-R1-DR-MS-M-2010-S3	3	30/03/2023
134. First Floor HVAC Layout -Sheet 2	CHS-SV-XX-R1-DR-MS-M-2011-S3	3	30/03/2023
135. First Floor HVAC Layout -Sheet 3	CHS-SV-XX-R1-DR-MS-M-2012-S3	1	05/04/2023
136. Second Floor HVAC Layout -Sheet 1	CHS-SV-XX-R2-DR-MS-M-2020-S3	3	30/03/2023
137. Second Floor HVAC Layout -Sheet 2	CHS-SV-XX-R2-DR-MS-M-2021-S3	3	30/03/2023
138. Second Floor HVAC Layout -Sheet 3	CHS-SV-XX-R0-DR-MS-M-2022-S3	1	05/04/2023
139. Third Floor HVAC Layout -Sheet 1	CHS-SV-XX-R3-DR-MS-M-2030-S3	3	30/03/2023
140. Third Floor HVAC Layout -Sheet 2	CHS-SV-XX-R3-DR-MS-M-2031-S3	3	30/032023
141. Roof Level HVAC Layout - Sheet 1	CHS-SV-XX-RF-DR-MS-M-2040-S3	3	30/03/2023
142. Roof Level HVAC Layout - Sheet 2	CHS-SV-XX-RF-DR-MS-M-2041-S3	3	30/03/2023
143. Control Schematic	CHS-SV-XX-R0-DR-MS-M-3001-S3	1	30/03/2023
144. Control Schematic 2	CHS-SV-XX-R0-DR-MS-M-3002-S3	1	30/03/2023
145. Mechanical Fan Coil Unit Schematic	CHS-SV-XX-R0-DR-MS-M-3003-S3	1	30/032023

Electrical and lighting drawings prepared by Steensen Varming

Title	Drawing Number	Revision	Date
146. Ground Floor Lighting Layout - Sheet 1	CHS-SV-XX-R0-DR-LS-E-3000-S3	3	30/032023
147. Ground Floor Lighting Layout - Sheet 2	CHS-SV-XX-R0-DR-LS-E-3001-S3	3	30/03/2023
148. Ground Floor Lighting Layout - Sheet 3	CHS-SV-XX-R0-DR-LS-E-3002-S3	3	30/03/2023
149. First Floor Lighting Layout - Sheet 1	CHS-SV-XX-R1-DR-LS-E-3010-S3	3	30/03/2023
150. First Floor Lighting Layout - Sheet 2	CHS-SV-XX-R1-DR-LS-E-3011-S3	3	30/032023
151. Second Floor Lighting Layout - Sheet 1	CHS-SV-XX-R2-DR-LS-E-3020-S3	3	30/03/2023
152. Second Floor Lighting Layout - Sheet 2	CHS-SV-XX-R2-DR-LS-E-3021-S3	3	30/03/2023
153. Third Floor Lighting Layout - Sheet 1	CHS-SV-XX-R3-DR-LS-E-3030-S3	3	30/03/2023
154. Third Floor Lighting Layout - Sheet 2	CHS-SV-XX-R3-DR-LS-E-3031-S3	3	30/03/2023

Landscape drawings prepared by Space Landscape Designs

Title	Drawing Number	Revision	Date
155. Landscape Site Plan	L-01	D	05/042023
156. Landscape detail plan	L-02	D	05/04/2023
157. Landscape sections	L-03	D	05/042023
158. Planting plan– Informal outdoor learning area	L-04	D	05/04/2023
159. Planting plan – Outdoor covered area	L-05	D	05/042023
160. Planting plan – Sensory Garden	L-06	D	05/04/2023