



BLACKETT
MAGUIRE+
GOLDSMITH

BCA ASSESSMENT REPORT

GREYSTANES PUBLIC SCHOOL

Prepared for:



Education

February 2018

Ref.: 160520

Rev 2

Address

Suite 2.01,
22-36 Mountain St
Ultimo NSW 2007

Contact

Ph: 02 9211 7777
Fax: 02 9211 7774



REPORT STATUS				
DATE	REVISION	STATUS	AUTHOR	REVIEWED
04/07/2017	0	BCA report on Concept Design	Brian Maguire	Tony Heaslip
13/11/2017	1	Revision following updated plans	Brian Maguire	Tony Heaslip
12/02/2018	2	Further revision following updated Plans	Brian Maguire	Tony Heaslip

Prepared by:

Brian Maguire
Director

Blackett Maguire + Goldsmith

Reviewed by:

Tony Heaslip
Director

Blackett Maguire + Goldsmith



BUILDING CODE OF AUSTRALIA ASSESSMENT

Greystanes Public School

Blackett Maguire + Goldsmith Pty Ltd have been engaged to undertake an assessment of the DA design documentation for the proposed development at Greystanes Public School located on 781 Merrylands Road in Greystanes against the requirements of the Building Code of Australia 2016 (BCA).

REPORT OBJECTIVES

The objectives of this report are to:

- confirm that the DA architectural documentation has been reviewed by an appropriately qualified Building Surveyor and Accredited Certifier;
- confirm that the proposed new building works can readily achieve compliance with the BCA pursuant to *section 109R of the Environmental Planning and Assessment Act, 1979* and/or, clause 145 of the *Environmental Planning and Assessment Regulation 2000*; and
- accompany the Development Application submission to enable the Consent Authority to be satisfied that subsequent compliance with the fire & life safety and health & amenity requirements of the BCA, will not necessarily give rise to design changes to the building which may necessitate the submission of an application under Section 96 of the *Environmental Planning and Assessment Act 1979*.

It should be noted that it is not the intent of this report to identify all BCA provisions that apply to the subject development. The development will be subject further assessment following receipt of more detailed documentation at Crown Certificate stage.

REFERENCED DOCUMENTATION

Our assessment of the concept design documentation was based on the following:

- + Building Code of Australia 2016 (BCA)
- + Guide to the Building Code of Australia 2016 (BCA Guide)
- + Architectural plans prepared by JDH Architects as referenced in Appendix 4 of this report

PROJECT TEAM

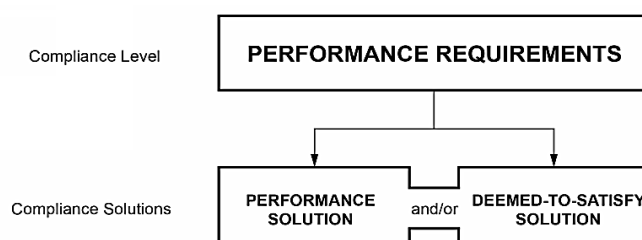
The following BM+G Team Members have contributed to this Report:

- + Brian Maguire - Project Team Leader
- + Patrick Cameron - Building Surveyor

ASSESSMENT METHODOLOGY

The Performance Requirements can only be satisfied by a:

- Performance Solution; or
- Deemed-to-satisfy Solution; or Complying with the Deemed-to-satisfy (DTS) Provisions; or
- A combination of (a) and (b).



In accordance with the above, we note that the proposed building design will achieve compliance with the BCA by way of a combination of compliance with the DtS provisions and also via Performance Solutions where appropriate, by the development and justification of Performance Solutions prepared by a C10 Accredited Fire Safety Engineer and/or an Accredited Accessibility Consultant at the Crown Certificate stage where required.



PROPOSED DEVELOPMENT

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned by JDH Architects to undertake a BCA assessment of the proposed development which comprises of:

- + Demolition of existing Block I, Demountable Buildings, COLAs, Block H and a portion of Block A;
- + Construction of a new three (3) storey Homebase Building (known as Block M) to the east of the school and containing the following.
- + Construction of a new single storey Administration Building (known as Block L) adjacent to a new COLA;
- + Refurbishment of the ground floor of Block A which will include a Multipurpose Learning Space.

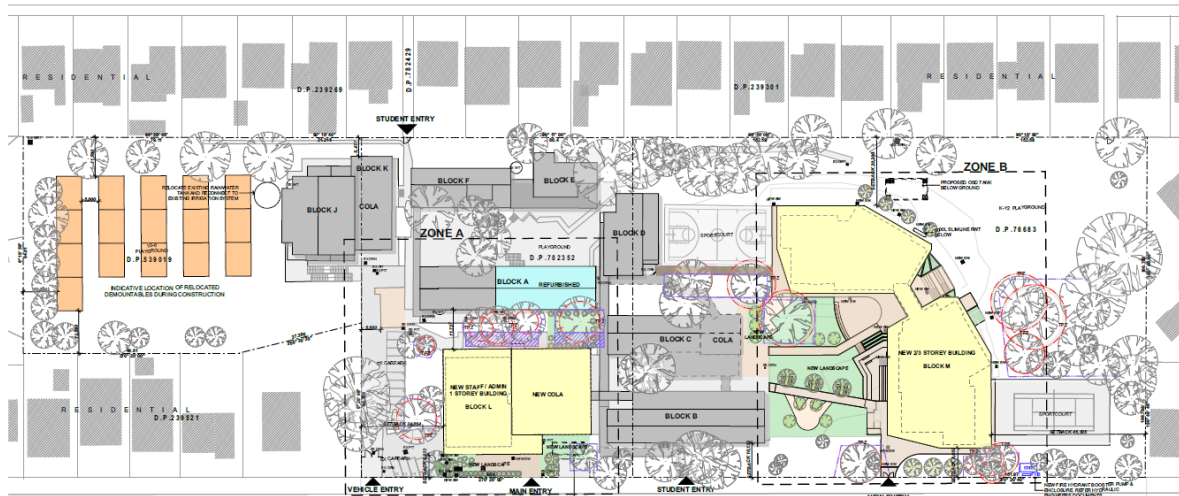


Figure 1: Site Plan



BUILDING CLASSIFICATION

The following table presents a summary of relevant building classification items of the proposed development:

+ BCA Classification:	Class 9b (School Assembly buildings) Admin/Staff Building and COLA: Class 5
+ Rise in Storeys:	Main Building: Three (3) Block A (New ground floor Multipurpose Space): Two (2) Admin/Staff Building and COLA: One (1)
+ Effective Height:	Less than 12m
+ Type of Construction:	Type A
+ Climate Zone:	Zone 6
+ Floor Area / Volume Limitations	Main Building: 8,000m ² / 48,000m ³ (complies) Admin: 3,000m ² / 18,000m ³

FIRE SOURCE FEATURE

The distances from the nearest Fire Source Features (Allotments and/or Buildings situated on the same allotments) are noted as follows:

BOUNDARY	DISTANCE TO FIRE SOURCE FEATURE
North	Main Building: >6m Admin: >3m from Block A
South	Main Building: >6m to the far side of Merrylands Road Admin: >3m to the far side of Merrylands Road
East	Main Building: >6m Admin: >3m to adjacent buildings
West	Main Building: >6m to the existing buildings on the site that are to remain Admin: >3m

SUMMARY OF KEY COMPLIANCE ISSUES

The following comprises a summary of the key compliance items identified in the report that will need to be addressed prior to issue of the Crown Certificate:

BCA CLAUSES		DESCRIPTION
1.	C2.6	Spandrel protection is required for the <u>Main Building</u> . Architectural elevations are to be provided for assessment as the design develops.
2.	C2.12	Fire pumps, some types of batteries, boilers and like will need to be provided with fire separating construction. Details of such rooms is to be provided.
3.	D2.21	Door hardware and door furniture for sliding doors in a path of travel is to address the provisions in this clause.
4.	D3	Accessibility matters associated with Door hardware, circulation space and design of sanitary facilities requires further assessment.
5.	E1.3	A fire hydrant system is required to be provided for the <u>Main Building, Staff/Admin and Block A building</u> in accordance with AS2419.1-2005. In this instance plans illustrate that the fire hydrant booster is located not closer than 10m from the nearest external wall therefore demonstrating compliance.



BUILDING CODE OF AUSTRALIA ASSESSMENT

SECTION B – STRUCTURE

Part B1 Structural engineering details prepared by an appropriately qualified structural engineer are to be provided to demonstrate compliance with Part B1. This will include the following Australian Standards (where relevant):

- + AS 1170.0 – 2002: General Principles
- + AS 1170.1 – 2002
- + AS 1170.2 – 2011: Wind Actions
- + AS 1170.4 – 2007: Earthquake Actions
- + AS 1288 – 2006, Glass in Buildings
- + AS 2047-2014: External Glazing
- + AS 3700 – 2011: Masonry Structures
- + AS 3600 – 2009, Concrete Structures
- + AS 4100 – 1998: Steel Structures
- + AS 4600 – 2005: Cold Formed Steel Structures.

SECTION C – FIRE RESISTANCE AND COMPARTMENTATION

The building will comply with the relevant Deemed-to-satisfy requirements of the BCA, having regard to the following specific matters being addressed:

Clause C1.1 (Fire Resisting Construction) All building elements to the Main Building are to achieve the required FRL in accordance with Table 3 in BCA Specification C1.1 for Type A Construction as applicable to Class 9b (See Appendix 1). In this regard the following is noted with respect to our assessment of the development:

- + Due to the fact that the building is required to be constructed of Type A Construction, the FRL to building elements applies in both directions i.e. FRL must be achieved from both sides of the external wall. Note: Non-loadbearing external walls need not be fire rated, with the exception of the spandrel protection portion.
- + All loadbearing internal walls are to be of concrete and/or masonry construction.
- + The following non-loadbearing elements are to be of non-combustible construction:
 - Internal walls required to be fire-resisting; and
 - A lift, ventilating, pipe, garbage, or similar shaft that is not for the discharge of hot products
- + In the storey immediately below the roof, internal columns need not have an FRL
- + Composite timber cladding is not proposed with this development, rather a series of FC sheeting and some Aluminium shading attachments. This will need to be assessed for its ability to comply with BCA Spec C1.1, namely:
 - Clause 2.4 where the product is proposed as an attachment to a wall;
 - Non-combustible construction where it forms part of the external wall.

All building elements to the Staff/Admin Building are to achieve the required FRL in accordance with Table 5 in BCA Specification C1.1 for Type C Construction where relevant (See Appendix 2). Note: Where external walls are >3m from a fire source feature the fire rating will not be required.

Clause C1.10 (Fire Hazard Properties) Fire hazard properties for all floor, wall and ceiling linings within the Main Building, Admin/Staff Building and Multipurpose Space portion of Block A are to comply with BCA Specification C1.10 with regard to smoke development rates, critical radiant flux and group ratings. In this instance, the following fire hazard properties apply:

- + Floor linings and coverings must achieve a Critical Radiant Flux of not less than 2.2kW/m² and a maximum smoke development rate of 750 percent-minutes;
- + Wall and ceiling linings are to achieve a material group number as specified in the table below and Smoke Growth Rate Index of not more than 100 or an Average Specific Extinction Area less than 250 m²/kg.

Class of building	Fire-isolated exits and fire control rooms	Public corridors		Specific areas		Other areas
	Wall/ceiling	Wall	Ceiling	Wall	Ceiling	Wall/ceiling
<u>Class 5, 6, 7, 8 or 9b schools</u>						
Unsprinklered	1	1, 2	1, 2	1, 2, 3	1, 2	1, 2, 3
Sprinklered	1	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3



Note: With respect to a Class 9b school the reference to “Specific areas” in the table above means classrooms.

- + Rigid and flexible ductwork must comply with the fire hazard properties in AS 4254 Parts 1 and 2.
- + Sarking material must achieve a Flammability Index of not more than 5.

Clause C2.2 (Compartmentation) The proposed development complies with the maximum floor area and volume limitations of 8,000m² / 48,000m³ for the Main Building and 3,000m² / 18,000m³ for the Staff/Admin Building.

Clause C2.6 (Spandrels) Spandrel protection is required for the Main Building where any part of a window or other opening in an external wall is above another opening in the storey next below and its vertical projection falls no further than 450 mm outside the lower opening (measured horizontally).

Compliance is readily achievable, architectural elevations are required to demonstrate compliance through the provision of either:

- + A vertical spandrel which achieves an FRL of 60/60/60 having an overall height of 900 mm or more, extending at least 600 mm or more above the upper surface of the intervening floor, and;
- + A horizontal projection (balcony) which achieves an FRL of 60/60/60 having an outwards projection from the external face of the wall of 1100 mm or more, and an extension along the wall beyond the openings of at least 450 mm

Note: Within the context of the BCA, a window or other opening means any part of the external wall of a building that does not have an FRL of 60/60/60 or greater.

C2.10 (Separation of Lift Shafts) Any lift connecting more than 2 storeys (or 3 storeys if the building is sprinklered) must be separated from the remainder of the building by an enclosure is a shaft which:

- + Type A Construction – shaft walls as per Spec C1.1
- + Type B – As per Table 4 of Spec C1.1 or be non-combustible if non-loadbearing.

Applies to the Main Building. The lift is indicated to be within its own shaft.

C2.12 (Separation of Equipment) Equipment such as the following is required to be fire separated from the remainder of the building by construction achieving an FRL of 120/120/120:

- + Lift motors/control panels;
- + Emergency generators – emergency equipment in emergency mode;
- + Central smoke control plant;
- + Boilers;
- + Battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours
- + On-site fire pumps

Details are to be provided for any such rooms contained within any of the buildings.

Clause C2.13 (Electricity Supply) Any switchboard sustaining emergency equipment operating in emergency mode must be separated from the remainder of the building with construction achieving an FRL of 120/120/120 with any doors to be -/120/30 self-closing fire doors.

Clause C3.2 (Protection of openings) Openings with a distance of less than 6m to a fire-source feature and 3m to the boundary are required to be protected in accordance with Clause C3.4. In this instance, the buildings proposed are not exposed to a fire source feature. No further action is required.

Clause C3.8 (Openings in fire-isolated exits) Doorways that open into fire isolated stairs must be protected by -/60/30 self-closing or automatic closing fire doors.

A window in an external wall of a fire isolated exit must be protected in accordance with C3.4 if it is within 6m of, and is exposed to a window or other opening in a wall of the same building, other than in the same fire rated enclosure.

Clause C3.9 (Service Penetrations in Fire Isolated Exits) Fire isolated exit must not be penetrated by any services other than:

- + Electrical wiring permitted by D2.7(e);
- + Ducting associated with pressurisation systems;
- + Water supply pipe for fire services.



Clause C3.10 (Openings in Fire isolated lift shafts) A lift shaft required to be protected is required to be provided with FRL -/60/- lift car doors, also complying with AS1735.11. Lift indicator panels must also be backed by -/60/60 construction if it exceeds 35000m² in area.

Clause C3.12 / C3.13 (Openings in floors and ceiling for services / and openings in shafts) Openings to service shafts are required to be protected by -/30/30 panel (if in a sanitary compartment), or a self-closing -/60/30 fire door, or a -/60/30 access panel. If the shaft is a garbage shaft, a door hopper of non-combustible construction is permitted to be installed. Architect to document the fire separating construction around the service shafts on the compartmentation plan accordingly.

Clause C3.15 Where service installations penetrate the walls or floors required to have an FRL with respect to integrity and insulation they are to be protected by fire seals (fire stopping system) having an FRL of the building element concerned. Fire Seals are to comply with the requirements of BCA Clause C3.15 and Specification C3.15 noting the following:

- + Fire seals needs to have been tested on the substrate it has been used on i.e. concrete, masonry, fire rated plasterboard, Hebel etc. – a fire stopping system tested in masonry cannot be relied upon for use in Hebel.
- + The maximum size of the services and the penetrations cannot exceed those tested for the fire stopping system
- + The fire stopping system needs to be used in the same orientation that it has been tested on i.e. floor or wall. A fire stopping system tested through a wall only cannot be relied upon when used for a service penetrating a floor.
- + The fire stopping system needs to have been tested on the service it is used to seal i.e. metal pipes, UPVC/PVC pipes, conduits, electrical cables etc. A fire stopping system tested on a PVC pipe cannot be relied upon for cables.
- + The test fire stopping system needs to include all elements specified to achieve the required FRL i.e. intumescent wraps are commonly required/used to achieve the insulation value (when required) for metal pipes, cable trays and large bundles of cables.
- + Where the mechanical ventilation system penetrates floors or walls that require an FRL, the installation is to comply with AS/NZS 1668.1 - 2015.



SECTION D – ACCESS AND EGRESS

The proposal demonstrates that compliance with the Performance Requirements of Section D of the BCA is readily achievable, noting the following:

Clause D1.2 (Number of Exits) Each storey within the Main Building and the Staff/Admin Building are served by not less than two (2) exits thereby satisfying the minimum requirements for a Class 9b building, and satisfying the minimum requirements for a class 5 building.

Clause D1.3 (Fire Isolated Exits) This clause is applicable to the Main Building only, i.e. the 'central' stair adjacent to the passenger lift connects more than 2 stores in an un-sprinklered class 5-9 building. See D1.7 below for construction of exits.

Clause D1.4 (Exit Travel Distances) The travel distances to exits within the building are required to be not more than 20 metres to a single exit, or a point where travel in different directions to two or more exits is available. Where there is a point of choice of two exits, all points on the floor are required to be within 40 metres to one of the exits. In this instance, compliance with the requirements of this clause has generally been achieved for the Staff/Admin Building and for the Main Building.

Note: areas in the Main building have sliding doors in the paths of travel to exits, and therefore need to be addressed for appropriate door hardware and door furniture. See D2.21 below for further information.

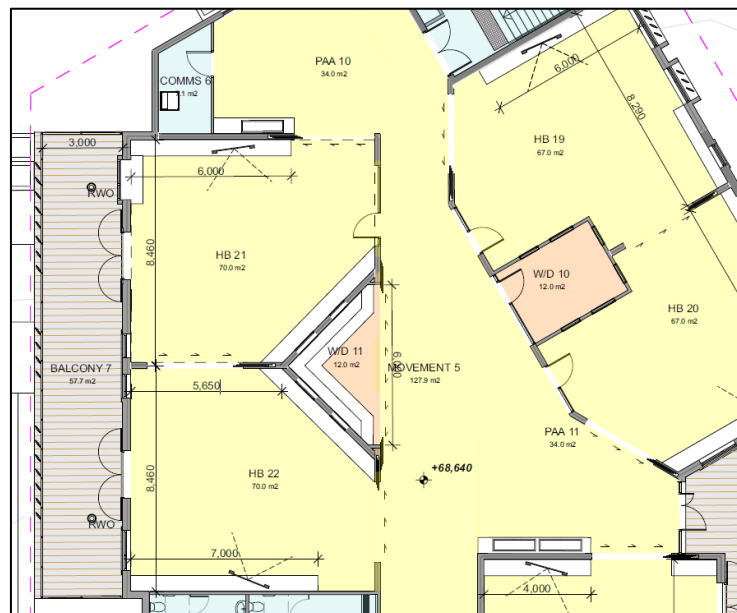


Figure 2: Second Floor Zone B

Clause D1.5 (Distance between alternative exits) The travel distances between alternative exits within the Main Building and Staff /Admin Building comply with the DTS provisions of the BCA, being no more than 60m apart and no less than 9m apart when measured back through the point of choice.

Clause D1.6 (Dimensions of Exits and paths of travel to Exits) The unobstructed height throughout an exit or a path of travel to an exit must be not less than 2 metres, except for doorways which may be reduced to not less than 1980mm. In addition, the unobstructed width of an exit or a path of travel to an exit must be not less than 1 metre or the required exit width determined under D1.6. **Note:** All new doorways must have a minimum clear width of 850mm.

Clause D1.7 (Travel via Fire Isolated Exits) 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 an FRL of not less than 60/60/60 and any openings protected internally in accordance with C3.4, for a distance of 3 m above or below, as appropriate, the level of the path of travel.

In this instance, the current design indicates compliance is achieved, noting that the stair discharges directly to open space at a half level below directly to open space.

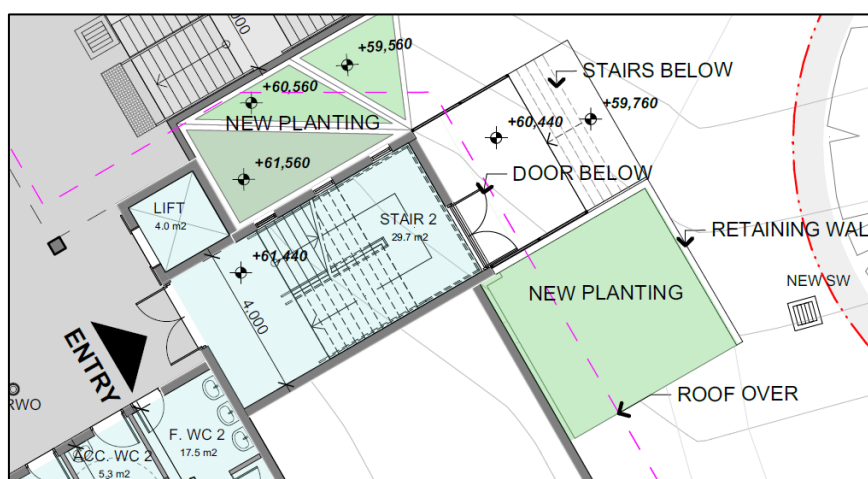


Figure 3: Ground Floor Zone B

Clause D1.9 (Travel via non-fire isolated exits) This clause is applicable to the Main Building only. The travel distance to open space via the non-fire-isolated stairway or non-fire-isolated stairs does not exceed 80 m.

Clause D1.10 (Discharge from Exits) The path of travel from open space to the road for the Main Building and Staff/Admin Building must have an unobstructed width of not less than the minimum width of the required exit or 1 m (whichever is the greater). Where the 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 on grade ramps and/or stairs that comply with BCA Clauses D2.13 and D2.17.

Clause D2.7 (Installations in Exits and Paths of Travel) The construction of Electrical Distribution Boards within the Main Building and Staff/Admin Building is to be in accordance with BCA Clause D2.7 with the enclosure bounded by a non-combustible or fire protective covering and smoke seals provided around the perimeter of the doors in each case.

Clause D2.8 (Enclosure of Space under Stairs and Ramps) This clause is applicable to the Main Building only. The space below the required non-fire-isolated stairways (including an external stairway) must not be enclosed to form a cupboard or other enclosed space unless:

- + The enclosing walls and ceilings have an FRL of not less than 60/60/60; and
- + Any access doorway to the enclosed space is fitted with a self-closing -/60/30 fire door.

Clause D2.13 (Treads and Risers) All stairs to and within the Main Building are to have solid risers, and are to have contrast nosings throughout in accordance with Clause 11.1 of AS1428.1-2009, Furthermore the stairs are required to be slip resistant in accordance with the requirements of Table D2.14 when tested in accordance with AS4586-2014. The following will apply:

- + Stairway must have not more than 18 and not less than 2 risers in each flight.
- + Goings and risers within the stair flights must be constant throughout.
- + Goings and risers are to be in accordance with BCA Table D2.13 as noted below:

	Riser (R)	Going (G)	Quantity (2R+G)
Maximum	190	355	700
Minimum	115	250	550

Clause D2.14 (Landings): Landings must 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; and
- + Have a non-slip finish throughout or an adequate non-skid strip near the edge of the landing where it leads to a flight below.

Clause D2.15 (Thresholds): Doors must not have a ramp or step closer to the door that the width of the door leaf except where opening to open space, where the change in level may be a maximum of 190mm (applying generally to fire isolated exit doors only).

Note: See D3 below for thresholds throughout 'Accessible Spaces', including the interface at the balconies, and also the entry/exit doors.



Clause D2.16 (Barriers) Barriers to prevent falls (Balustrades) are to be provided to all stairways, floors, corridors, etc. where the fall to the level below is more than 1m in height. Barriers are to comply with Table D2.16a including the following:

- + Achieve a minimum height of a balustrade is 1m above the floor of the landing, walkway or the like; and 865mm above the floor of a stairway or a ramp and not permit a sphere of 125mm diameter to pass through.
- + Where the floor is more than 4m above the surface beneath the balustrade, any horizontal or near horizontal members between 150mm and 760mm above the floor must not include horizontal or near horizontal members that could facilitate climbing.
- + Note: Particular attention will need to be paid to the interface between handrails and barriers at Level 2 of the Main Building.
- + For windows where the floor is more than 4m above the surface beneath, the window sill must be a minimum of 865mm in height above the height of the floor surface.

Clause D2.17 (Handrails) Handrails are required for stairs and ramps in the building and must be designed to include:

- + one handrail fixed at a height of not less than 865 mm; and
- + a second handrail fixed at a height between 665 mm and 750 mm

Furthermore, handrails will require extensions at the top of the stair (minimum of 300mm) and bottom of the stair (minimum of 300mm + 1 tread width) with either a 180° turn-down or be turned 90° back to the wall as per the diagram from AS1428.1-2009. Refer also to Clause D2.16 above regarding floors more than 4m above the surface below.

Clause D2.19 (Doorways and doors) Should any sliding doors be proposed to serve as a required exit, the door must be able to be opened manually under a force of not more than 110N and open automatically if there is a power failure to the door or on the activation of a fire or smoke alarm anywhere in the fire compartment served by the door. Refer to comments under Part D3 for accessibility requirements for the proposed sliding doors.

Clause D2.20 (Swinging doors): A swinging door in a required exit or forming part of a required exit must swing in the direction of egress. The current design for the Main Building indicates compliance has generally been achieved noting that the proposed sliding doors will need to address the requirements of the door furniture in D2.21 below.

Clause D2.21 (Operation of latch) This clause is applicable to the Main Building. Hinged doors in a path of travel to an exit must be readily openable without a key from the side that faces a person seeking egress and have a single handed downward action of pushing action on a single device located between 900mm and 1100mm from the floor.

Further, the sliding doors in the building that are required for a path of travel to an exit (i.e. the sliding doors from the Homebases where hinged doors are not provided) are to be provided with a 'D' type handle located between 900-1100mm above FFL and the force required at the door handle to operate the door shall not exceed 20N as per Clause 13.5.2 of AS1428.1-2009

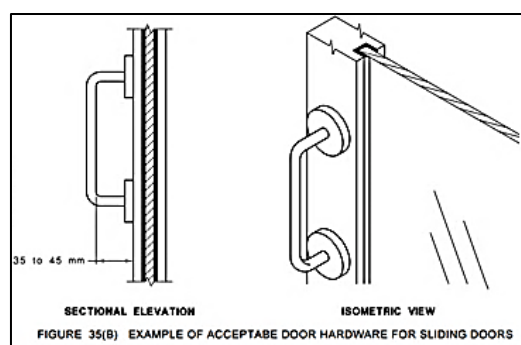


Figure 4: Acceptable sliding door hardware

Clause D2.23 (Signs on Doors): The doors to the fire isolated exits are to have signage located on the outside of the fire isolated exit stating:

**FIRE SAFETY DOOR
DO NOT OBSTRUCT
DO NOT KEEP OPEN**

Where they are proposed to be held open they are to state (on both sides of the door);

FIRE SAFETY DOOR - DO NOT OBSTRUCT



In addition, the discharge doors from the fire stairs are to also have signage located on either side of the door stating:

FIRE SAFETY DOOR – DO NOT OBSTRUCT

All signage is to have lettering not less than 20mm in height. Statutory fire exit signage “Offences Relating to Fire Stairs” is also to be erected adjacent each fire door on the outside in accordance with Clause 183 of the EP & A Regulation 2000

Part D3 (Access for people with disabilities) Access for persons with a disability will be provided to the Main Building, the new Staff/Admin building, and also the new refurbishment works to Block A to create a new Multipurpose space from what is currently staff areas to address BCA Part D3. In this instance, it is understood that an Accredited Access Consultant will be engaged to assess compliance for both Part D3 provisions and the DDA Access to Premises – Buildings Standards.

The following matters at a minimum will need to be addressed:

- + Access from the street to the principal pedestrian entrance of the building is to be provided in accordance with AS1428.1-2009.
- + All new doors to and within are required to have a clear width of not less than 850mm and comply with the circulation space requirements under AS 1428.1 - 2009.
- + Where an entry door is proposed to have multiple door leaves (except an automatic opening door) one of the door leaves must have a clear width of not less than 850mm.
- + The door thresholds to external areas cannot contain any step or change in level exceeding 3mm.
- + 30% luminance contrasts are to be provided to all new doorways e.g. contrasting between door leaf & jamb; or door leaf & wall; or architrave & wall; or door leaf & architrave and/or door jamb & adjacent wall.
- + All frameless glass panels or fully glazed doors on an accessway are to be clearly marking in accordance with AS 1428.1/AS1288. In this instance, all frameless glass panel or fully glazed doors, including glazing capable of being mistaken for a doorway or opening, shall be marked with a full width solid non transparent contrast line not less than 75mm wide is
- + Walking surfaces to be slip resistant and certification in respect to the slip resistance of any tiles and vinyl will be required at the Occupation Certificate stage to verify compliance with AS/NZS 4586.
- + Every accessible stairway in the building is required to satisfy requirements under Clause 11 of AS 1428.1 – 2009. This includes, contrast stair nosing’s between 50 and 75mm deep across the full width of the path of travel. The strip may be set back 15mm from the front of the nosing and must possess a minimum luminance contrast of 30% to the background. The strip must not extend down the riser more than 10mm. This includes the fire EXIT stairs.
- + Handrails are required to both sides of non-fire isolated stairs with 300mm extensions (top) and 1 tread width +300mm extensions (bottom) and full 180 degree turn downs in accordance with Section 11 of AS1428.1-2009.
- + Tactile Ground Surface Indicators are to be provided to all stairs in a building (with the exception of fire isolated exit stairs) required to be accessible. In addition, tactile indicators will need to be provided to an accessway meeting a vehicular way adjacent to a pedestrian entry if there is no kerb or kerb ramp.
- + All door hardware, light switches and GPO’s controls are to comply with Sections 13 and 14 of AS1428.1-2009 respectively.
- + Braille tactile signage is to be provided to all exits



SECTION E – SERVICES AND EQUIPMENT

Clause E1.3 (Fire Hydrants) A fire hydrant system is required to be provided for the new Main Building and the new Staff/Admin building in accordance with AS2419.1-2005 (as the floor area exceeds 500m²).

Fire Hydrant coverage required to be provided to all of Block A as the building has a floor area greater than 500m².

Internal Fire Hydrant landing valves are to be located within 4m of the exit i.e. the nosing of the first riser of the stairs to level 1 & 2 and the designated exit doors at the ground level. Details are to be provided with respect to the location of the fire hydrant booster assembly and its proximity to the building.

Clause E1.4 (Fire Hose Reels) Fire hose reels are not required to serve the new Main Building Homebases. However, they are required to serve the Multipurpose Space in Block A, and also the Staff/ Admin building, and will need to be located within 4m of an exit. Note, coverage to all of Block A is not required, only to the Multi-purpose and non-classroom areas.

Clause E1.6 (Potable Fire Extinguishers) Portable fire extinguishers (PFE) are required to be provided as listed in Table E1.6, to serve the building in accordance with AS 2444-2001.

Clause E2.2 A fire detection and alarm system is not required for the Main Building or Staff/Admin Building as neither building has a rise in storeys of more than 3.

However, Should a ducted air-handling system (other than non-ducted individual room units <1,000l/s) be designed to the new building, the system must be shut down automatically upon the activation of smoke detectors installed complying with Cl. 5 of Spec. E2.2a, i.e. AS1668.1-2015).

Clause E3.3 (Warning Against use of Lifts in Fire): Signage stating “DO NO USE LIFT IF THERE IS A FIRE” is to be provided near the lift call button in letters not less than 10mm in height.

Clause E3.6 (Facilities for People with Disabilities): As the lifts are required to be provided for accessibility, they must be compliant with a lift specified under Table E3.6a (as appropriate) and the provisions of AS1735.12, with the primary matters as below:

- + Have minimum internal floor dimensions of 1400 x 1600mm.
- + Have doors with a minimum clear opening width of 900mm
- + Be fitted with a series of door opening sensory devices / passenger protection devices.

Clause E4.2 Emergency lighting is required to be provided to the Main Building and Staff/Admin Building and the new Multipurpose Space portion of Block A in accordance with AS 2293.1-2005.

Clause E4.5/E4.6 Exit and directional exit signage is required to be provided to the Main Building and Staff/Admin Building and the new multipurpose space portion of Block A in accordance with AS 2293.1-2005.



SECTION F – HEALTH AND AMENITY

The proposal demonstrates that compliance with the DTS provisions of Section F of the BCA is readily achievable subject to the following:

Clause F1.1 (Stormwater drainage): Stormwater drainage must be installed as per AS 3500.3 - 2003.

Clause F1.5 (Roof coverings): A roof must be covered with

- + Concrete roof tiles complying with AS 2049 and fixed as per AS 2050.
- + Cellulose cement corrugated sheeting compiling with AS/NZS 2908.1 and installed as per AS/NZS 1562.2.
- + Metal roof sheeting comply with AS 1562.1
- + Plastic roof sheeting complying with AS/NZS 4256 parts 1, 2 3 and 5 and AS/NZS 1562.3.
- + Asphalt shingles complying with ASTM D3018-90 class A.

Clause F1.6 (Sarking): Sarking must be installed to roof and walls for weatherproofing as per AS/NZS 4200.1 and 2 - 1994.

Clause F1.7 (Waterproofing of wet areas): Wet areas in the building are required to comply with AS 3740-2004.

Clause F1.13 (Glazed assemblies): Glazed assemblies in the external wall of the building are required to comply with AS 2047 requirements for resistance to water penetration. All other glazing installations are to comply with AS1288-2006.

Part F2 (Sanitary and Other Facilities) Preliminary calculations of the maximum population number for students within the Main Building and for staff in the Staff Admin Building have been completed. The proposed sanitary facilities will allow for a maximum population of:

- + Main Building: 1500 Students (700 Male and 800 Female)
- + Staff Admin Building: 70 Staff: (20 Male and 50 Female)

Occupant type		Facilities provided		Maximum Population
Employees	Male	Closet Pans = 2	Urinals = 1	20
	Female	Washbasins = 4	Closet Pans = 4	50
Students	Male	Washbasins = 4	Urinals = 16	700
	Female	Washbasins = 14	Closet Pans = 19	800
			Washbasins = 16	

Clause F2.4 (Facilities for people with disabilities) The Access Consultant will need to review the proposed design and sanitary compartment layouts for accessible and ambulant sanitary facilities to confirm compliance with AS1428.1-2009. However, the following is noted with respect to the proposed sanitary facilities:

- + The sanitary facilities located within the staff Homebase will need to ensure both Male and Female students are designed as ambulant where necessary.
- + Particular attention will need to be given to ensure that the dimensions of the ambulant compartments comply with the requirements of AS1428.1-2009.

Clause F2.5 (Construction of Sanitary Compartments) A clear space of 1200mm is required between the closet pan and the hinge of the door unless the door is readily removable from the outside. In this instance it is noted that compliance is generally achieved based upon the assumption that the closet pans are only partially enclosed i.e. the cubicle does not extend to the ceiling.



Clause F2.6 (Interpretation: Urinals and Washbasins) The calculation of sanitary facilities referenced in Clause F2.3 (above) has incorporated the following:

- + The urinal troughs provided in the male student sanitary facilities have been counted in accordance with F2.6 (a)(ii) i.e. each 600 mm length of a continuous urinal trough to counts as a urinal.
- + Closet pans have been counted in place of a urinal as specified in BCA Clause F2.6(a)(iii) – this is noted as surplus WCs may be counted as urinals to allow for a greater population.

Part F3 (Room Heights) Rooms within the Main Building, Multipurpose Space portion of Block A and Staff/Admin Building are to achieve a minimum floor to ceiling height of:

- + Homebases/Classrooms and other parts of the assembly buildings which accommodate less than 100 persons – 2.4m;
- + Other parts of the assembly buildings which accommodate more than 100 persons – 2.7m;
- + Corridors serving parts of the building which accommodate less than 100 persons – 2.4m;
- + Corridors that serve parts of the building which accommodate more than 100 persons – 2.7m;
- + Office and admin areas – 2.4m;
- + Public corridors in the office and admin areas – 2.1m;
- + All bathrooms, sanitary compartments, kitchens, store rooms etc. – 2.1m;
- + Above a stairway, ramp, landing or the like – 2m measured vertically above the nosing line of stairway treads or the floor surface of the ramp, landing or the like.

Note: Architectural Sections and Elevations will be required to verify compliance with the above requirements.

Clause F4.1 (Natural Lighting) Natural light is required to be provided to all general-purpose classrooms within the Main Building. The windows to Homebases are to have an aggregate light transmitting area of at least 10% of the floor area of the room they serve.

In this instance compliance is readily achievable. The proposed 'withdrawal spaces' are not considered General Purpose Classrooms for the purposes of providing natural light. In this instance it is evident that both artificial and also the light borrowed from the main general classroom will be available to the occupants.

Clause F4.4 (Artificial Lighting) Artificial lighting complying with AS/NZS 1680.0-2009 is required to the following rooms/spaces within the Main Building, Multipurpose space and Staff/Admin Building where natural light cannot be provided, and the periods of occupation or use will create undue hazard to occupants seeking egress in an emergency:

- + Rooms that are frequently occupied,
- + All spaces required to be accessible,
- + All corridors, lobbies, internal stairways, other circulation spaces; and
- + Paths of egress.

Clause F4.5 (Ventilation of Rooms): The building is required to be provided with:

- + Natural ventilation consisting of permanent openings, windows, doors or other devices which can be opened in and which achieves an open area not less than 5% of the floor area of the room; or
- + a mechanical ventilation or air-conditioning system complying with AS1668.2; or
- + A combination of the abovementioned natural ventilation and mechanical ventilation/air-conditioning.

In this instance compliance is readily achievable. The proposed 'withdrawal spaces' are to rely on either natural or mechanical ventilation, and if natural ventilation is the proposed method this will need to be based on the calculation of the natural ventilation available to the General classroom.

Clause F4.8 (Restriction of position of water closets and urinals) A room containing a closet pan or urinal must not open directly into

- + Kitchen or pantry;
- + Public dining room or restaurant;
- + Dormitory in a class 3;
- + A room used for public assembly (not being a room in a early child hood, primary school or open spectator stand);
- + Workplace normally occupies by more than 1 person.



Unless provided with an airlock, or unless the WC is provide with mechanical exhaust, and the door is screened from view, such a design will need to be addressed.

In this instance, the concession relating to public schools apply to the Main Building and the Multipurpose Space. The WCs in the Staff/Admin building open into a public corridor. No further action is required in this regard.

SECTION J – ENERGY EFFICIENCY

The following energy efficiency design measures will be required to be implemented into the design of the Main Building and Staff/Admin Building to satisfy the requirements for Climate Zone 6. In this respect, we note that the following requirements of BCA Section J will apply to the building (of which the applicant may engage the services of an Energy Efficiency Consultant):

- + J1: Building Fabric - the external fabric to be designed and constructed to reduce heat flow
- + J2: External Glazing - Thermal performances, solar orientation, shading
- + J3: Building Sealing - Doors, windows, roof lights i.e. to avoid leakage
- + J5: Air-conditioning and ventilation systems - operation, e.g. time switches; exhaust
- + J6: Artificial lighting and power - type and operation of lighting and power system
- + J7: Hot water supply - avoiding heat loss
- + J8: Access for maintenance - access to time switches, shading devices, etc.

Note: BCA Section J requirements with respect to building fabric, building sealing and glazing are only applicable to the parts of the Multipurpose Space portion of Block A where there a proposed changes to the external walls or windows.



CONCLUSION

In view of the above assessment we can confirm that subject to the above measures being undertaken that compliance with the Performance Requirements of the BCA is readily achievable. In addition, it is considered that such matters can adequately be addressed in the preparation of the tender documentation design documentation without giving rise to any inconsistencies with the development consent.

Should you wish to discuss please do not hesitate to contact me on 9211 7777.

Yours sincerely,

Brian J. Maguire (JP)
Accredited Certifier (BPB Accreditation No.0241)
Director - Blackett Maguire + Goldsmith



APPENDIX 1

TABLE 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

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

Note: the roof of the building is not required to be fire rated, i.e. it does not have a rise in storeys greater than 3.

Fire isolated stairs and fire isolated lifts are required to have a fire rated lid.



APPENDIX 2

TABLE 5 TYPE C CONSTRUCTION: FRL OF BUILDING ELEMENTS

BUILDING ELEMENT	Class of building—FRL: (in minutes)			
	Structural Adequacy/Integrity/Insulation			
	2, 3 or 4	5, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any <i>fire-source feature</i> to which it is exposed is—				
Less than 1.5 m	90/90/90	90/90/90	90/90/90	90/90/90
1.5 to less than 3 m	-/-/-	60/60/60	60/60/60	60/60/60
3 m or more	-/-/-	-/-/-	-/-/-	-/-/-
EXTERNAL COLUMN not incorporated in an <i>external wall</i> , where the distance from any <i>fire source feature</i> to which it is exposed is—				
Less than 1.5 m	90/-/-	90/-/-	90/-/-	90/-/-
1.5 to less than 3 m	-/-/-	60/-/-	60/-/-	60/-/-
3 m or more	-/-/-	-/-/-	-/-/-	-/-/-
COMMON WALLS and FIRE WALLS—	90/90/90	90/90/90	90/90/90	90/90/90
INTERNAL WALLS—				
Bounding public corridors, public lobbies and the like—	60/60/60	-/-/-	-/-/-	-/-/-
Between or bounding sole-occupancy units—	60/60/60	-/-/-	-/-/-	-/-/-
Bounding a stair if required to be rated—	60/60/60	60/60/60	60/60/60	60/60/60
ROOFS	-/-/-	-/-/-	-/-/-	-/-/-



APPENDIX 3

PRELIMINARY LIST OF FIRE SAFETY MEASURES

Based on the preliminary assessment of the development, the following fire safety measures are required within the building:

MAIN BUILDING	
Statutory Fire Safety Measure	Design / Installation Standard
Emergency lighting	BCA Clause E4.2 and E4.4 & AS 2293.1-2005
Exit Signs	BCA Clause E4.5, E4.6, E4.8 & AS 2293.1-2005
Fire Blankets	AS 3504 – 1995 & AS2444 – 2001
Fire Hydrants	BCA Clause E1.3 and AS2419.1 - 2005
Fire Hose Reels (Non-classroom areas)	BCA Clause E1.4 & AS 2441 -2005
Mechanical Air handling (Automatic shutdown)	BCA Clause E2.2 and AS1668.1-2015
Paths of Travel	EP&A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001

Staff/Admin Building	
Statutory Fire Safety Measure	Design / Installation Standard
Emergency lighting	BCA Clause E4.2 and E4.4 & AS 2293.1-2005
Exit Signs	BCA Clause E4.5, E4.6, E4.8 & AS 2293.1-2005
Fire Hose Reels	BCA Clause E1.4 and AS2441-2005
Fire Hydrants	BCA Clause E1.3 and AS2419.1-2005
Paths of Travel	EP&A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001

Block A Schedule

Staff/Admin Building	
Statutory Fire Safety Measure	Design / Installation Standard
TBC	TBC



APPENDIX 4

ARCHITECTURAL PLANS PREPARED BY JDH ARCHITECTS

DRAWING NUMBER	REV	DATE	DRAWING NUMBER	REV	DATE
SSD00	A	07.11.2017	SSD01	B	29.11.2017
SSD02	B	29.11.2017	SSD11	D	08.02.2018
SSD12	B	29.11.2017	SSD13	B	29.11.2017
SSD22	B	29.11.2017	SSD31	D	08.02.2018
SSD32	B	29.11.2017	SSD33	E	08.02.2018
SSD34	D	08.02.2018	SSD35	D	08.02.2018
SSD36	B	29.11.2017	SSD41	B	29.11.2017
SSD42	B	29.11.2017	SSD43	B	29.11.2017
SSD44	B	29.11.2017	SSD51	B	29.11.2017
SSD52	B	29.11.2017	SSD61	A	07.11.2017
SSD71	B	29.11.2017	SSD81	B	29.11.2017
SSD82	A	07.11.2017	SSD91	A	07.11.2017

APPENDIX 5

BUILDING CODE OF AUSTRALIA TERMINOLOGY

Performance Solution

A Building Solution which complies with the Performance Requirements other than by reason of satisfying the DtS Provisions.

Building Code of Australia (BCA)

Document published on behalf of the Australian Building Codes Board. The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia and is adopted in New South Wales (NSW) under the provisions of the EP&A Act.

Climatic Zone

Is an area defined in BCA Figure A1.1 and in Table A1.1 for specific locations, having energy efficiency provisions based on a range of similar climatic characteristics.

Crown Certificate

Approval issued by the Certifying Authority pursuant to s.109R(2) of the EP&A Act 1979.

Construction Type

The construction type is a measure of a buildings ability to resist a fire. The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1, except as allowed for—

- (i) certain Class 2, 3 or 9c buildings in C1.5; and
- (ii) a Class 4 part of a building located on the top storey in C1.3(b); and
- (iii) open spectator stands and indoor sports stadiums in C1.7.

Note: Type A construction is the most fire-resistant and Type C the least fire-resistant of the types of construction.

Deemed to Satisfy Provisions (DtS)

Provisions which are deemed to satisfy the Performance Requirements.

Exit

An exit means –

- i. Any of a combination of the following if they provide egress to a road or open space:
 - a. An internal or external stairway
 - b. A ramp;
 - c. A fire isolated passageway
 - d. A doorway leading to a road or open space
- ii. A horizontal exit or a fire isolated passageway leading to a horizontal exit



Effective Height

The vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units).

Fire Source Feature (FSF)

The far boundary of a road which adjoins the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.

Fire Resistance Level (FRL)

The grading periods in minutes for the following criteria-

- (a) structural adequacy; and
 - (b) integrity; and
 - (c) insulation,
- expressed in that order.

Fire Source Feature (FSF)

The far boundary of a road which adjoins the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.