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ARMIDALE SECONDARY COLLEGE

BUILDING CODE OF AUSTRALIA 2016 AMENDMENT 1
ZONE 8 REDESIGN & WALKWAYS TO DEN & BUS STOP

APRIL 2020

Report prepared for	NBRS Architecture Level 3, 4 Glen Street Milsons Point NSW 2061 Attention: Ryan Southwell
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CONTENTS

DOCUMENT ACCEPTANCE

Company	Name	Signed	Date
Metro Building Consultancy	Sean Moore		23/04/20

REVISION HISTORY

Description	Prepared by	Revision No.	Date
BCA Report (Zone 8)	Sean Moore	R05	23/04/20
BCA Report (Architectural Zone 8)	Sean Moore	R04	08/11/19
BCA Report (Architectural)	Sean Moore	R03	05/09/19
BCA Report (Services, Civil, Landscaping Drawings)	Sean Moore	R02	26/08/19
BCA Report (Architectural)	Sean Moore	R01	16/07/19

1.0 Introduction and Documentation

Introduction
NBRS Architecture has requested Building Code of Australia 2016 Amendment 1 advice in relation to the BCA compliance of the architectural design documents for the proposed new Zone 8 building at Armidale Secondary College located at Butler Street, Armidale NSW 2350 and the proposed new access walkways down to the Den and bus stop.

The architectural drawings submitted to date has been reviewed for compliance with the Deemed-to-Satisfy provisions of the Building Code of Australia 2016 Amendment 1 excluding Section B structure, Part G5 bushfire and Section J energy efficiency. This report is for the exclusive use of NBRS Architecture 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 architectural drawing 17352-NBRS-DA-012 Rev 04 dated 17/04/20 provided by NBRS Architecture to Metro Building Consultancy on the 21/04/20 and the NBRS sketch for the proposed level of Zone 8 and the Den & Bus Stop sketch dated 12/03/20 have been assessed for compliance to the Building Code of Australia 2016 Amendment 1.

Application of Building Code of Australia 2016 Amendment 1
Clause 109R (2) of the Environmental Planning and Assessment Act states that the BCA that is applicable to the project is the one in force at the time of the date of invitation to tender. As the tender date was prior 01/05/19 the BCA that is applicable to the project is BCA 2016 Amendment 1.

> 109R Building, demolition and incidental work
> (2) Crown building work cannot be commenced unless the Crown building work is certified by or on behalf of the Crown to comply with the technical provisions of the State's building laws in force as at:
> (a) the date of the invitation for tenders to carry out the Crown building work, or
> (b) in the absence of tenders, the date on which the Crown building work commences, except as provided by this section.

2.0 Use and class of building

The following table lists the uses and classifications of the proposed new building.

Zone 8 – Agriculture New Building

Level	Use	Class	Approx. floor area
Ground	Classrooms, amenities and ancillary staff room	Class 9b	503m^2

The building has a rise of storey of 1.
The effective height of the building is NA as it is single storey.

3.0 Construction and fire resistance ratings

A class 9b building (Zone 8 building) with a rise of storeys of 1 is required to comply with the Building Code of Australia Type C Construction requirements. These are listed in Appendix A.

Exposure to a fire source feature
A part of a building element 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, is not obstructed by another part of the building that has an FRL of not less than 30/–/–.

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 walls of Zone 8 are located more than 3m from the external walls of other buildings on site and are not required to be provided with an FRL.

Lightweight construction
New lightweight construction required to have an FRL must comply with Specification C1.8 of the Building Code of Australia.

Fire Hazard Properties
All new floor, wall and ceiling linings are to comply with the requirements of Clause C1.10 and Specification C1.10 of Building Code of Australia 2016 Amendment 1.

The laboratory test result for the fire hazard indices of the proposed timber seating in the tiered seminar space and the resilient flooring are required to be provided for review prior to procurement / installation of the material.

Compartmentation – Zone 8
The Building Code of Australia 2016 Amendment 1 requirement for a Type C Class 9b building fire compartment is that the maximum floor area must not exceed 3,000m^2 and the maximum volume must not exceed 18,000m^3. The floor area of Zone 8 does not exceed this limitation.

Boilers
Any rooms that contain boilers must be fire separated from the remainder of the building by construction that achieves an FRL of at least 2 hours.

> **Boiler** means a vessel or an arrangement of vessels and interconnecting parts, wherein steam or other vapour is generated, or water or other liquid is heated at a pressure above that of the atmosphere, by the application of fire, the products of combustion, electrical power, or similar high temperature means, and—
> (a) includes superheaters, reheaters, economisers, *boiler* piping, supports, mountings, valves, gauges, fittings, controls, the *boiler* settings and directly associated equipment; but
> (b) excludes a fully flooded or pressurised system where water or other liquid is heated to a temperature lower than the normal atmospheric boiling temperature of the liquid.

Battery Rooms
Any rooms that contain a battery or batteries that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours (eg UPS, solar panel battery room etc) must be fire separated from the remainder of the building by construction that achieves an FRL of at least 2 hours.

Electricity supply equipment
If the main switchboard sustains emergency equipment operating in the emergency mode 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.

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 C3.15 and Specification C3.15.

4.0 Egress

Principles
The building's egress system 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 maximum distance of travel from any point on a floor to a point of egress to a road or open space by way of a non fire isolated stair must not exceed 80m.
- 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 ie 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.
- Handrails along stairs and ramps are required to have a minimum height of 865-1000mm. (The recommended height for the handrails is 900mm.)
- Balustrades are required to have a minimum height of 865mm along stair flights and 1m along landings and walkways where the drop is greater than 1m.
- The balustrade provisions apply to the tops of all new retaining walls that form part of, or are directly associated with a delineated path of access to a building from the road, or a delineated path of access between buildings.
- Balustrades are not permitted to have an opening greater than 125mm.
- Balustrades that protect a fall of more than 4m are not permitted to facilitate climbing within a 150-760mm zone measured from floor level.
- 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
The buildings are required to be provided with at least two exits per storey and two exits are provided from each storey.

Travel Distances
The maximum distance of travel to an exit is required to be 40 metres, and to a point of choice is required to be 20 metres, the distance between alternate exits is not permitted to exceed 60 metres

The travel distances in Zone 8 comply.

Distance between alternative exits
Exits that are required as alternative means of egress must be located so that alternative paths of travel do not converge such that they become less than 6 m apart.

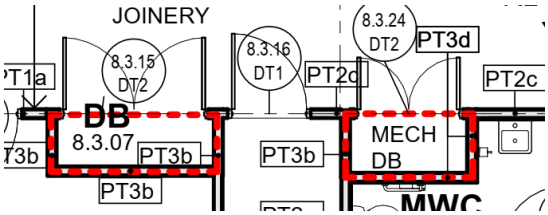
Dimensions of exits
All paths of travel are required to be provided with a minimum 1m clear width and 2m clear head height.

Travel by non-fire-isolated stairways
The BCA requires that the travel distance from any point on a floor to a point of egress to a road or open space by way of a non-fire-isolated stairway must not exceed 80m.

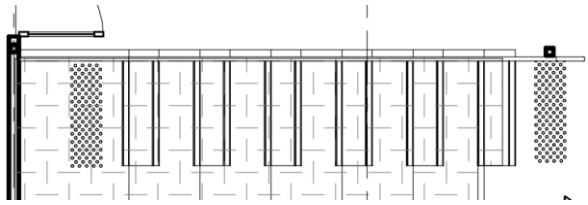
The BCA requires that a non-fire-isolated stairway must discharge at a point not more than:

- 20m from a doorway providing egress to a road or open space; or
- 40m from one of 2 such doorways or passageways if travel to each of them from the non-fire-isolated stairway is in opposite or approximately opposite directions.

Installations in exits and paths of travel
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. See example below.



Enclosure of space under stairs and ramps
The space below a required non fire-isolated stairway (to the tiered seminar space) 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.



Stairs
Stairs are considered to be 2 risers and this includes the stairs to the tiered seminar space.

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 700mm and 900mm.

The treads or nosing strips of the internal stairs must have a slip-resistance classification not less than P3 when tested in accordance with AS 4586 2013.

Stairs are required to be provided with treads with a constant dimension and treads and risers that comply with the formula 2R+G = 550-700.

Landings
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.

Door thresholds
The threshold of all doorways must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless it is provided with a threshold ramp or step ramp in accordance with AS1428.1 2009.

The fall to the double gates and sliding doors are not permitted to be steeper than 1:33.

Balustrades
A balustrade with a minimum height of 865mm is required to be provided to the side of a stairs to protect a fall of more than 1m eg 900mm.

A balustrade with a minimum height of 1m is required to be provided to protect a fall of more than 1m eg 1100mm.

All balustrade are required to not have any openings greater than 125mm and a construction tolerance should be added eg 100mm.

Handrails
Handrails along stairs are required to have a minimum height of 865-1000mm. The recommended height the handrails are 900mm.

Fixed platforms, walkways, stairways and ladders
A fixed platform, walkway, stairway, ladder and any going and riser, landing, handrail or barrier attached thereto may comply with AS 1657 2013 in lieu of the BCA if it only serves machinery rooms, boiler houses, lift-machine rooms, plant-rooms and the like.

Exit door swing
All exit doors are required to swing in the direction of travel i.e. outwards.

Door hardware
The door hardware to all proposed swing and sliding 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 device which is located between 900 mm and 1.2 m from the floor.

A door is only permitted to be provided with a fail-safe device which automatically unlocks the door if the building is provided with a sprinkler system or a smoke detection system.

5.0 Accessibility

General building access requirements

Disabled access is required to be provided to and within all areas normally used by the occupants.

As stated above disabled access is required to be provided to and within all areas normally used by the occupants. This includes the bootroom etc.

Access to buildings

Disabled access is required to be provided to the proposed building from:

- the existing and proposed main points of a pedestrian entry at the allotment boundary; and
- from another accessible building connected by a pedestrian link; and
- from any required accessible carparking space on the allotment.

From the allotment boundary
The BCA states that disabled access must be provided to a building from the main points of a pedestrian entry at the allotment boundary.

Accessible carspaces
Disabled access is required to be provided from the accessible carspaces to the proposed buildings.

Access within buildings

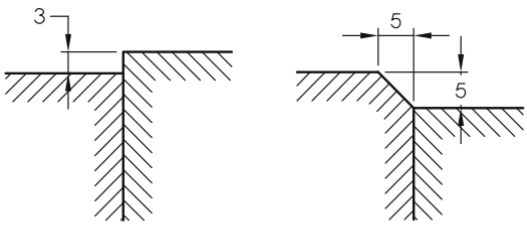
Continuous accessible paths of travel
The minimum unobstructed height of a continuous accessible path of travel is required to be 2m or 1.98m at doorways and the minimum width is required to be 1m and 850mm at doorways.

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 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 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.

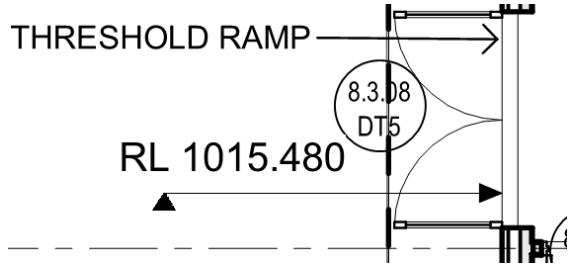
Location	Wet pendulum test	Oil-wet inclining platform test
External ramps steeper than 1:14	P5	R12
External ramps and walkways not steeper than 1:14	P4	R11
Wet areas within schools eg toilets	P3	R10
Transitional areas within schools	P2	R9
Dry areas within schools	P1	R9
Stair tread or landing surface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

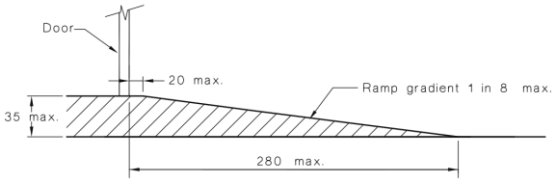
The laboratory test result for the slip resistance of the proposed timber seating in the seminar spaces, the resilient flooring and the epoxy flooring is required to be provided for review prior to procurement / installation of the material.

Parts of buildings to be accessible

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.

Please note that threshold ramps are not permitted to be under the doors and are to start at the doorway or a maximum distance of 20mm from the edge of the doorways.





DIMENSIONS IN MILLIMETRES

FIGURE 21 THRESHOLD RAMP

Step Ramps

As1428.1 2009 requires a max grade of 1:10 for step ramps, a max rise of 190mm and a max length of 1900mm. The edges of the step ramp are required to be protected by a suitable barrier as documented.

Stairs

Stairs are required to have opaque risers and the stair nosings are not permitted to project beyond the face of the riser. (Note that it is very common for timber stairs to have nosings projecting beyond the face of the riser, this is not permitted, and a right angle connection has to be clearly specified eg the timber stairs to seminar space)

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.

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 lack of a second handrail to the seminar space stairs has been addressed in a performance solution.

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

Stair flights are required to be provided with landings at the top and bottom. Landings are required to have a minimum length of 750mm and a maximum gradient of 1:50.

The BCA states that a stair consists of two or more risers and not more than 18 are permitted in a flight. Single steps are therefore not considered to be stairs.

Walkways

Walkways are required to have a maximum gradient of 1:20 and 1:20 walkways are required to be provided with landings at intervals no greater than 15m.

Where walkways are provided on site they 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.

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.

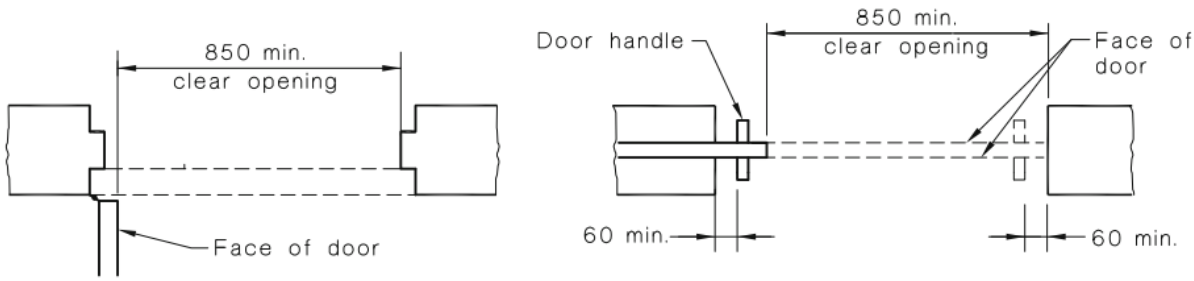
Doorways

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.



(a) Swing door (b) Cavity sliding door

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.

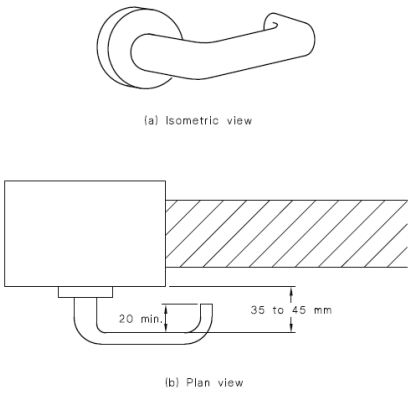
Door handles and related hardware are required to be of the type that allows the door to be unlocked and opened with one hand. The handle is required to be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch. ‘D’ type handles shall be provided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

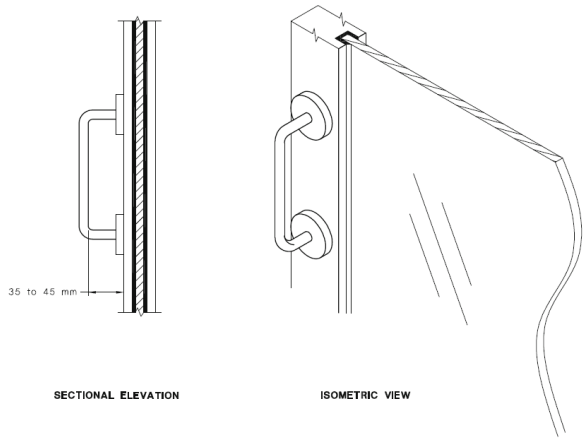
The clearance between the handle and the back plate or door face at the centre grip section of the handle is required to be not less than 35mm and not more than 45mm.

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

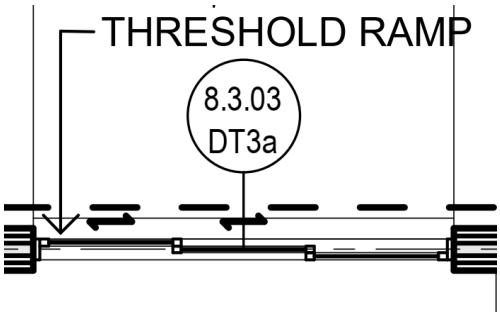
For doors other than fire doors where a door closer is fitted, the force required at the door handle to operate the door shall not exceed 20N.

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 sliding door shown below is required to be automated or provided with a compliant D pull handle that has a minimum 60mm gap between it and the door frames when in the open and closed position.



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 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 storerooms or other areas used occasionally by staff.

Signage
Braille and tactile signage complying with the requirements of BCA Specification D3.6 is required to be provided to:

- The doorway to the female toilets;
- The doors to the male and female ambulant cubicles;
- The doorway to the accessible toilets.

The sign to the doorway of the accessible toilet must identify if the facility is suitable for left or right handed use.

Braille and tactile signage complying with the requirements of BCA Specification D3.6 is required to be provided to the exit doorway. The sign is required to state 'Exit Ground Level'.

Braille and tactile signage complying with the requirements of BCA Specification D3.6 is required to be provided to a room and space provided with hearing augmentation.

The signage is required to include the international symbol for deafness and must identify:

- the type of hearing augmentation; and
- the area covered within the room; and
- 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.

This applies to AV systems such as period bells if they are also capable of operating as an inbuilt amplification system ie making announcements etc.

If a hearing augmentation system is an induction loop, it must be provided to not less than 80% of the floor area of the room or space served by the inbuilt amplification system.

If a hearing augmentation system is a system requiring the use of receivers or the like, it must be available to not less than 95% of the floor area of the room or space served by the inbuilt amplification system, and the number of receivers provided must not be less than:

- if the room or space accommodates up to 500 persons, 1 receiver for every 25 persons or part thereof, or 2 receivers, whichever is the greater; and
- if the room or space accommodates more than 500 persons but not more than 1000 persons, 20 receivers plus 1 receiver for every 33 persons or part thereof in excess of 500 persons.

Any screen or scoreboard associated with a Class 9b building and capable of displaying public announcements must be capable of supplementing any public address system, other than a public address system used for emergency warning purposes only.

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

- the non fire rated stairway serving the tiered seminar space;
- the underside of an overhead obstruction (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.

Wheelchair seating spaces in Class 9b assembly buildings
Where fixed seating is provided in a Class 9b assembly building (ie school), wheelchair seating spaces complying with AS 1428.1 2009 must be provided in the following ratios:

Number of fixed seats	Number of wheelchair spaces	Grouping & location
Up to 150	3 spaces	1 single space & 1 group of 2 spaces

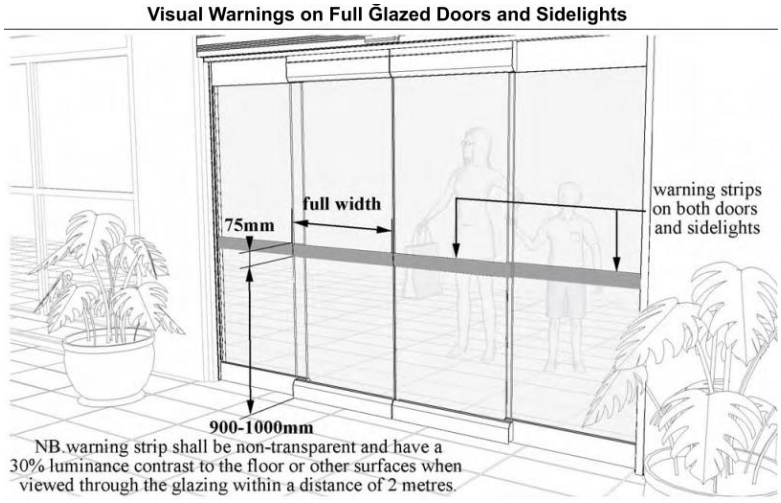
The tiered seminar seating is deemed to be fixed seating in a Class 9b building and are required to be provided with wheelchair seating spaces as per the BCA and AS1428.1 2009.

This has been addressed in a performance solution.

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.



Accessible sanitary facilities

Accessible toilets
At least 1 accessible toilet is required to be provided on every storey containing sanitary compartments and where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments and accessible toilet is required to 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 1100 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 1100N;
- 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.

Ambulant cubicles
An ambulant cubicle is required to be provided at each bank of toilets where there is one or more toilets in addition to an accessible toilet.

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.

6.0 Services and Equipment

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

Fire Hydrants
If the Ag building will have a floor area that exceeds 500m^2 it is required to be provided with fire hydrant coverage in accordance with BCA Clause E1.3 and AS2419.1 2005.

Fire Hose-Reels
If the Ag building will have a floor area that exceeds 500m^2 all areas, other than the classrooms and associated corridors, are required to be provided with fire hose reel coverage in accordance with BCA Clause E1.4 and AS2441 2005.

Portable Fire Extinguishers
Portable fire extinguishers must be provided in accordance with BCA Clause E1.6 and AS 2444 2001.

Smoke hazard management – Auto Shutdown
The NSW Variation of the BCA states that Class 9b assembly buildings (eg schools) 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/NZS 1668.1 2015) on the activation of smoke detectors installed complying with Clause 5 of BCA Specification E2.2a and any other fire detection and alarm system.

Clause 5 of BCA Specification E2.2a 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 2015.

Emergency Lighting and Exit Signs
Exit signs and an emergency lighting system must be provided and must be in accordance with the BCA Clause E4.2, E4.4, E4.5, E4.6, E4.8 and AS 2293.1 2005.

7.0 Health and Amenity

Damp & weatherproofing
The external walls of the proposed building are required to comply with BCA Performance Requirement FP1.4. Where a cladding is proposed it is required to have a CodeMark Certificate of Conformity confirming compliance to BCA FP1.4.

Stormwater drainage
The stormwater drainage is required to comply with AS/NZS 3500.3 2015.

Roof coverings
All metal sheet roofing is required to comply with AS 1562.1 2018.

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 Table F1.7; and
(ii) comply with AS 3740 2010.

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 2000 or 2014.

Damp-proofing of floors on the ground
If a floor of a room is laid on the ground or on fill, moisture from the ground must be prevented from reaching the upper surface of the floor and adjacent walls by the insertion of a vapour barrier in accordance with AS 2870 2011, except damp-proofing need not be provided if—
(a) weatherproofing is not *required*; or
(b) the floor is the base of a stair, lift or similar *shaft* which is adequately drained by gravitation or mechanical means.

Subfloor ventilation
Subfloor spaces must be provided with openings in *external walls* and internal subfloor walls in accordance with BCA Table F1.12 for the climatic zones given in BCA Figure F1.12 and have clearance between the ground surface and the underside of the lowest horizontal member in the subfloor in accordance with BCA Table F1.12.

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

Toilets
Please provide the proposed population of Zone 8 so that an assessment can be made of the number of toilets required.

Accessible toilets
Accessible toilets must comply with the requirements of AS1428.1 2009.

Ambulant cubicles
Separate male and female ambulant cubicles for staff and students are required and must comply with Clause 16 of AS1428.1 2009.

Room Sizes
All classrooms and offices are required to have a minimum ceiling height of 2.4m.

Corridors, passageways and sanitary compartments are required to have a minimum height of 2.1m.

All stairs are required to have a minimum height of 2m.

Light
All general purpose classrooms must be provided with adequate natural light amounting to at least 10% of the floor area of the room. Windows are required to open to the sky or face a court or other space open to the sky or an open verandah, carport or the like.

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.

Ventilation
All areas of the buildings, except the storerooms, 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. Note that the window openings must make an allowance for any opening size restrictions placed on the windows by the balustrade requirements.

8.0 Class 9b Building – Special Use Buildings

In a seating area in the seminar spaces the gradient of the floor surface must not be steeper than 1 in 8, or the floor must be stepped so that a line joining the nosings of consecutive steps does not exceed an angle of 30° to the horizontal.

9.0 Energy Efficiency

Building Fabric
Any parts of the building that are provided with an air-conditioning system (including a gas heater) with an input power of more than 15 W/m^2 (ie it is a conditioned space) must comply with the building fabric requirements of Part J1 of the Building Code of Australia 2016 Amendment 1.

External Glazing
Any parts of the building that are provided with an air-conditioning system (including a gas heater) with an input power of more than 15 W/m^2 (ie it is a conditioned space) must comply with the glazing requirements of Part J2 of the Building Code of Australia 2016 Amendment 1.

Building Sealing

Any parts of the building that are provided with an air-conditioning system (including a gas heater) with an input power of more than 15 W/m^2 (ie it is a conditioned space) must have seals specified to the external doors and operable windows and must have self-closing devices specified to the external doors all as per the requirements of Part J3 of the Building Code of Australia 2016 Amendment 1.

The provision of non self-closing doors in the building envelope has been addressed in a performance solution. Please ensure that the ESFG requirement that the air conditioning (in the areas served with the sliding doors) be provided with a 1 hour count down timer to limit the use of air conditioning in these areas is incorporated into the mechanical services design.

Ventilation Systems, Artificial Lighting, Hot Water Supply

The design stage services consultants design certificates have confirmed that the services comply with the requirements of BCA Section J.

10.0 Conclusion

The architectural design documentation provided to date has been assessed in respect to the deemed to satisfy provisions of the Building Code of Australia 2016 Amendment 1. The design is at a point where the design can be finalised, further reviews are required as the design is completed.

APPENDIX A – TYPE C CONSTRUCTION REQUIREMENTS

The following table lists the fire resistance levels for the proposed Zone 8 building.

Building Element	Fire Resistance Level in minutes Structural adequacy/Integrity/Insulation Required for Class 9b
External wall (including any column and other building element incorporated therein) or other external building element, where the distance from any fire source feature to which it is exposed is -	
Less than 1.5m	90/90/90
1.5 to less than 3m	60/60/60
3m or more	-/-/-
External column not incorporated in an external wall, where the distance from any fire source feature to which it is exposed is -	
Less than 1.5m	90/-/-
1.5 to less than 3m	60/-/-
3m or more	-/-/-
Common wall and fire walls	90/90/90
Internal walls bounding a stair if required to be rated	60/60/60
Roofs	-/-/-