

## Specific BCA Review

### New Indoor Basketball Stadium - 62 Hillsborough Rd Hillsborough

#### BCA requirements for Compartmentation, Services and Egress Only

##### BCA Characteristics

BCA Classification:	Class 9b with different uses associated to different areas including assembly building, entertainment venue and exhibition centre.
Rise in Storeys:	2 (main auditorium) and 1 (other parts)
Type of Construction:	Type A
Compartment limit	8,000m <sup>3</sup> or 48000m <sup>3</sup>
General FRL	120 mins
Effective height:	<12m
Climate zone:	5
Conditioned space:	TBA

The following key provisions are highlighted.

BCA Provision	Comments
C1.9	<b>Non-combustible building elements</b> In a building <i>required</i> to be of Type A construction, the following building elements and their components must be <i>non-combustible</i> : (i) <i>External walls and common walls</i> , including all components incorporated in them including the facade covering, framing and insulation. (ii) The flooring and floor framing of lift pits. (iii) <i>Non-loadbearing internal walls</i> where they are <i>required</i> to be <i>fire-resisting</i> .
C1.10	<b>Fire Hazard Properties</b> New floor linings/ floor coverings require Compliance with BCA C1.10 and Spec C1.10. <a href="#">This will be reviewed once the areas to be sprinkler protected are confirmed.</a>
C2.7	<b>Separation by fire walls</b> <b>Separation of buildings</b> — A part of a building separated from the remainder of the building by a fire wall may be treated as a separate building for the purposes of the Deemed-to-Satisfy Provisions of <b>Sections C, D and E</b> if it is constructed in accordance with <b>(a)</b> and the following: (i) The fire wall extends through all storeys and spaces in the nature of storeys that are common to that part and any adjoining part of the building. (ii) The fire wall is carried through to the underside of the roof covering. <b>Compartmentation Note</b> – Any Sprinkler to non-sprinkler protected areas require separation via FRL 120 min Firewall. A part of a building separated from the remainder of the building by a firewall (FRL 120) may be treated as a separate building for the

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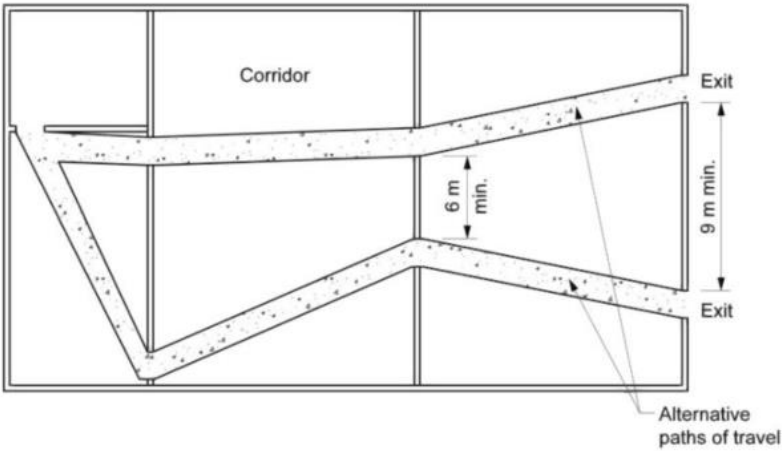
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BCA Provision	Comments
	<p>purposed of BCA Part C, D and E (can share facilities under Part F). This may be beneficial in not having to provide above services to all areas of the building, just the part (fire compartment(s)/ separate building(s)) containing the intended use.</p>
C3.2	<p><b>Protection of openings in external walls</b></p> <p>Openings in an external wall <b>that is required to have an FRL</b> must—</p> <p>(a) if the distance between the opening and the fire-source feature to which it is exposed is less than—</p> <ul style="list-style-type: none"> <li>(i) 3 m from a side or rear boundary of the allotment; or</li> <li>(ii) 6 m from the far boundary of a road, river, lake or the like adjoining the allotment, if not located in a storey at or near ground level; or</li> <li>(iii) 6 m from another building on the allotment that is not Class 10,</li> </ul> <p>be protected in accordance with C3.4 and if wall-wetting sprinklers are used, they are located externally; <b>and windows required for natural ventilation shall not be exposed to boundary without protection.</b></p>
Spec. C1.11	<p><b>Performance of external Walls in a Fire</b></p> <p>Structural engineer to certify compliance – external wall panels to resist collapsing outwards during fire.</p>
D1.4	<p><b>Exit travel distances</b></p> <p>The following is noted on the basis of a max population of 4250 within Auditorium. (Note - egress width and facilities provided will have to cater for this population).</p> <ul style="list-style-type: none"> <li>• NSW D1.2 – 2 exits required from every storey within an auditorium within an entertainment venue. Plans depict 2). <b>Additional exits will be required to support travel distance.</b></li> <li>• D1.4 – Travel distance is limited to 20m to an exit or to a point of choice where two exits are available in which case the max distance to one of these exits is 40m. The max distance between alternate exits shall be non-more than 60m apart and no closer than 9m. Alternate exits shall not converge so any part becomes closer than 6m.</li> </ul> <p><b>Figure D1.5(2) Plan showing converging paths of travel</b></p>
	

**Numerous areas are non-compliant for this aspect. Confirmation is required how compliance will be achieved for:**

- Exits from court 1-4 are not clear. Some areas appear more than 40m to an exit, more than 60m between alternate exits where measure through the point of choice.
- Toilet facilities that discharges near function and plant room have extended travel to POC. The toilet facilities also has extended travel to either of the alternate exits.
- Egress from the general facilities and ancillary rooms that surround court 10 merge with auditorium egress (refer D1.6).
- The western stands house approx. 273 persons. Travel distance complies for 20m to POC and <40m to an exit. This will use approx. 1.37m of egress width from each of the alternate egress paths adjoining the stand. This allows an additional 1.2m (120 persons) from the main grandstand to egress through the exit either side. Note current plans depict boundary along western façade less than that of the aggregate egress width it is intended to be catered for.
- Travel distance is non-compliant in many areas in main auditorium due to lack of provision of exits, merging of egress paths that do not support the combined clear width clear width and extended travel to exits.
- The upper auditorium level can achieved compliant travel distance to NFI stair and then from NFI stair to through horizontal exit to court 6-7 alternate exits. Where the court 6-7 diminished exit width is use for upper floor it cannot be used for GL (combined aggregate width refer D1.6).

D1.6

### Dimensions of exits

Note - An exit must lead to open space which must connect back to public road. The external courtyard between court 3 and court 10 cannot be used as an exit unless the path of travel from open space to public road is greater or equal to the persons discharging from exit. Indications are that the boundary is to be increased to accommodate **the combined aggregate width** of persons discharging into the area. Significant design changes will be required where this is not provided. Similarly the road that runs along courts 2-9 is 6.9m and shall not cater to more than 6.9m in either direction.

#### NSW D1.6 Dimensions of exits

(f)

(vi) in a Class 9b building used as an *entertainment venue*—

(A) in parts of the building used by the public, the width of the *required exit* or path of travel, and the unobstructed width of each doorway must not be less than 1 m and not more than 3 m; and

(B) in other parts of the building, doorways must comply with D1.6(f).

NSW BCA D1.6 – The above Clause requires min 1m and max 3m for the width of the required exits OR path of travel within shall not be less than 1m or more than 3m. In other parts of the buildings doorways shall comply with BCA D1.6(f). *Only exits that are required as an alternative path to each other are required to be more than 9m path. It is permissible to have different exits (not used as an alternative to each other) to be located next to each other e.g the southern external stairs from auditorium are not alternate exits to each other therefore permitted to be closer than 9m.*

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- (j) in a Class 9b building used as an *entertainment venue*—
- (i) the aggregate width must be not less than 2 m plus 500 mm for every 50 persons or part in excess of 200; and
  - (ii) D1.6(b), (c) and (d) do not apply; and
  - (iii) where one or more paths of travel merge, the width of the combined path of travel must be not less than the sum of the *required* widths of those paths of travel; and
  - (iv) the *required* widths of the paths of travel connecting the *exits* from the building to a public road or *open space* must comply with (iii).

For a max expected population of 4000 this will require  $2\text{m} + ((3800/50) \times 500\text{mm}) = 40\text{m}$ . The min unobstructed aggregate exit width (path of travel to exits) shall not be less than **40m**. The will require further design development as the plans are less than this **Approx 28m currently** assuming travel distance complies, merge and pinch points are rectified. Note – all stairs that are NFI require a handrail on both sides which will reduce egress width.

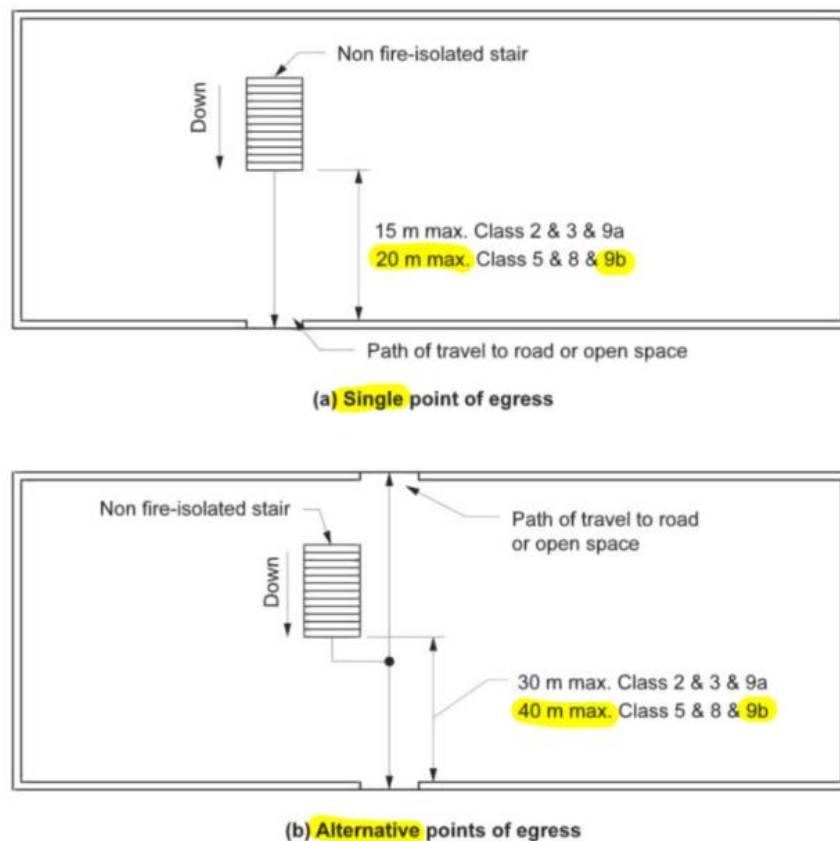
BCA D1.6(f) requires the unobstructed width of a doorway used as exit shall not be less than 250mm of the required width of the exit. This will require further design development where larger population are intended to egress through front foyer.

D1.9

**Non fire isolated stairs**

Non fire isolated stairs (Court 10 upper floor) has travel distance restrictions of max 80m from start point to open space. The stair must discharge at a point no further than 20m from a doorway opening to road or public space OR 40m from two such doorways if travel is in the approximately opposite direction.

**Figure D1.9(4) Plans showing compliance with D1.9(d) and (e) for the discharge of non-fire-isolated stairways**



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D1.10 **Discharge from Exits**

D1.10 – Exits cannot be blocked at the point of discharge, **the path of travel from open space to public road cannot be less than that required for aggregate egress width or all merging paths (exit paths cannot diminish)**

**NSW D1.10 Discharge from exits**

(f) In a Class 9b building used as an *entertainment venue*, at least half of the *required* number of *exits* from each *storey* or *mezzanine*, and at least half of the aggregate width of such *exits* must discharge otherwise than through the main entrance, or the area immediately adjacent to the main entrance of the building.

NSW D1.10 (f) – requires at least half the aggregate exit width **(20m)** must discharge **otherwise than** through the main entrance or immediately adjacent to the main entrance.

Bollards may required to new exit doors capable of being blocked by vehicles.

E1.3 **Fire hydrants**

Coverage required to entire building in accordance with AS2419.1-2005.

E1.4 **Hose reels**

Coverage required to entire building in accordance with AS2441-2005. **Ensure Hose reels do not pass through fire rated doors.**

E1.5 **Sprinklers - TBA**

E1.6 **Portable Fire Extinguishers**

Required in accordance with Table E1.6

**Table E1.6 REQUIREMENTS FOR EXTINGUISHERS**

Occupancy class	Risk class (as defined in AS 2444)
<b>General provisions</b> —Class 2 to 9 buildings (except within <i>sole-occupancy units</i> of a Class 9c building)	<p>(a) To cover Class AE or E fire risks associated with emergency services switchboards. (Note 1)</p> <p>(b) To cover Class F fire risks involving cooking oils and fats in kitchens.</p> <p>(c) To cover Class B fire risks in locations where flammable liquids in excess of 50 litres are stored or used (not including that held in fuel tanks of vehicles).</p> <p>(d) To cover Class A fire risks in normally occupied <i>fire compartments</i> less than 500 m<sup>2</sup> not provided with fire hose reels (excluding <i>open deck carparks</i>).</p> <p>(e) To cover Class A fire risks in classrooms and associated corridors in primary and secondary schools not provided with fire hose reels.</p> <p>(f) To cover Class A fire risks associated with a Class 2 or 3 building or Class 4 part of a building.</p>

E2.2

**Smoke hazard management**

Primary use Class 9b assembly Building which includes an **Entertainment venue** and Auditorium.

**Assembly building** means a building where people may assemble for—

- (a) civic, theatrical, social, political or religious purposes including a library, theatre, public hall or place of worship; or
- (b) educational purposes in a **school, early childhood centre**, preschool, or the like; or
- (c) entertainment, recreational or sporting purposes including—
  - (i) a cinema; or
  - (ii) a sports stadium, sporting or other club; or
- (d) transit purposes including a bus station, railway station, airport or ferry terminal.

**Entertainment venue** is as defined in the Environmental Planning and Assessment Regulation 2000.

(see below)

**entertainment venue** means a building used as a cinema, theatre or concert hall or an indoor sports stadium.

**Auditorium** means a part of an **entertainment venue** used or intended to be used for the purposes of accommodating an audience to an entertainment.

**Services Note** – Where the above is the only intended use and the floor area of a fire compartment does not **exceed 5,000m<sup>2</sup>**. This will require:

- Auto shutdown of mech vent (**requires smoke detection**) **AND**
- Auto smoke exhaust i.a.w Spec E2.2b **OR**
- Roof mounted smoke and heat vents i.a.w Spe E2.2c **OR**
- Auto smoke detection i.a.w Spec E2.2a **OR**
- **Sprinkler system to BAC E1.5. OR**
- Smoke detection to **E2.2a OR EWIS** to E4.9 (where intended to have theatre or public hall use)

Secondary (to be confirmed) is **Exhibition hall**/ museum/ art galleries or the like. Museums and art galleries are self-explanatory however exhibition hall are defined as:

**Exhibition halls**

The **Table E2.2b** provisions for exhibition halls which are used for trade displays and the like are based on them having hazards similar to those for shopping centres and indoor markets.

**Services Note** – Where there is intended to be **any** use as an exhibition hall , museum or art gallery or the like (in addition to detection and auto shut down and EWIS) this will also require:

Building or part has floor area between 2000m<sup>2</sup> and 3,500m<sup>2</sup> requires:

- a) Automatic smoke exhaust i.a.w BCA Spec E2.2b **OR**
- b) Roof mounted smoke and heat vents i.a.w Spe E2.2c **OR**
- c) Sprinkler system complying with BAC Spec E1.5.

Building or part has floor area exceeding 3,500m<sup>2</sup> requires:

- d) Sprinkler system complying with BAC Spec E1.5. **AND**
- e) Automatic smoke exhaust i.a.w BCA Spec E2.2b **OR**
- f) Roof mounted smoke and heat vents i.a.w Spe E2.2c

BCA Provision	Comments
Part E3	<b>Lifts</b> Lift to comply with Spec E3.1 Warning signs required to E3.3 Stretcher facility not required. Not an emergency lift. AS1735.12 compliance required
E4.2 & E4.4	<b>Emergency lighting</b> Required to all egress paths and internal stairways in accordance with AS2293.1-2018
E4.5, E4.6, E4.8	<b>Exit signs</b> Exit signage required to exit doors and any other area where the exit is not readily apparent to occupants. AS2293.1-2018
E4.9	<b>EWIS</b> EWIS will be required for any community or public hall use in accordance with E4.9.

**Note – Part H have numerous area that will impact egress and seating and will likely limit the expected population. This will be reviewed as the design progresses.**

Some have been listed below:

#### NSW H101.1 Application of Part

This Part applies to every *entertainment venue* as described in the Environmental Planning and Assessment Regulation 2000.

#### NSW H101.2 Fire separation

If an *entertainment venue* forms part only of a building, then—

- (a) the whole of the *entertainment venue*; or
- (b) the part containing the *stage*, *backstage* area and *auditorium*,

must be separated from the other parts of the building by construction having an FRL of not less than 60/60/60.

#### NSW H101.3 Foyer space

Where an *entertainment venue* is used principally for the purpose of—

- (a) exhibiting *films*; or
- (b) conducting live *stage* productions,

foyer space (excluding stairways and concession areas) must be provided on the basis of at least 0.25 m<sup>2</sup> for each person that the *auditorium* accommodates.

#### NSW H101.4 Sprinkler systems for common foyers

In an *entertainment venue*, where multiple *auditoriums* have a foyer in common, the following applies—

- (a) If the foyer serves not more than 2 *auditoriums*; that foyer must be separated from any adjoining foyer by construction having an FRL of not less than 60/60/60.
- (b) If the foyer serves more than 2 *auditoriums*, a sprinkler system (other than a FPAA101D or FPAA101H system) complying with *Specification E1.5* must be installed—
  - (i) throughout the *storey* containing the foyer; and
  - (ii) throughout each *storey* in the building below that *storey*.



## NSW H101.11 Seating in rows

This clause does not apply to *continental seating* or seating at tables.

### NSW H101.11.1 Number of seats

Subject to NSW H101.11.5, where seating is arranged in *rows*, the maximum of seats in each *row* must not exceed—

- (a) 8 where there is an *aisle* at one end only of the *row*; or
- (b) 6 where there are *aisles* on both ends of the *row*.

### NSW H101.11.2 Chairs used for seating

Chairs used for seating must—

- (a) where they have arms, be at least 500 mm from centre to centre; and
- (b) where they do not have arms, be at least 450 mm from centre to centre; and

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- (c) have a *minimum lateral clearance* of at least 300 mm between—
  - (i) the front of each chair and the back of the chair in front; or
  - (ii) if a guardrail is provided in front of the chairs, between the front of each chair and the guardrail; and
- (d) have a distance of at least 950 mm between the back of each chair and the back of the chair in front.

### NSW H101.11.3 Chairs in auditoriums—Level floors

Chairs in an *auditorium* that has a level floor must be—

- (a) securely fastened to the floor; or
- (b) secured together in groups of not less than 4 and not more than 16.

### NSW H101.11.4 Chairs in auditoriums—Sloping floors

Chairs in an *auditorium* having a sloping floor, or having stepped or inclined platforms, must be securely fastened to the floor or platform.



### NSW H101.11.7 Platforms and steps

Where an *aisle* contains platforms or steps—

- (a) the platforms and steps must extend for the full width of the *aisle*; and
- (b) if there are no intervening steps between levels of platforms, the height of the platform riser must not be more than 200 mm; and
- (c) if there are one or more intervening steps between levels of platforms—
  - (i) each riser must be at least 100 mm but not more than 200 mm high; and
  - (ii) each going must be at least 250 mm deep; and
  - (iii) risers and goings must be uniform; and
- (d) goings which are more than 450 mm deep at platform level must not have a grade of more than 1 in 50; and
- (e) at the entrance from the *aisle* to each *row* there must be a clear level floor space, extending the full width of the *aisle*, of at least 300 mm, measured from the back of the *row* in front; and
- (f) any going projecting in front of a seat adjacent to an *aisle* must be protected by a guardrail.

### NSW H101.11.8 Stepped platforms

Where stepped platforms without chairs or stepped platforms with bench seats, are used for seating—

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- (a) each platform must be at least 700 mm deep; and
- (b) each seating space must be at least 450 mm wide, measured along the front of the platform or bench seat; and
- (c) each seating space must be numbered consecutively; and
- (d) at the entrance from the *aisle* to each *row* there must be a clear level floor space, extending the full width of the *aisle*, of at least 300 mm, measured from the back of the *row* in front; and
- (e) any going projecting in front of a seat adjacent to an *aisle* must be protected by a guardrail; and
- (f) in the case of stepped platforms with bench seats, there must be at least 300 mm between the back of each seat and the front of the platform behind, or the front of the bench seat behind, whichever is the closer.

### NSW H101.12.2 Maximum seats per row

The number of seats in a *row* must not exceed 120.

### NSW H101.12.3 Depths of seating rows

The depth of each *row* of seating (that is, the distance between the back of the *row* in front or, if there is a guardrail in front, between the back of the *row* and the guardrail) must, in respect of a *row* containing a number of seats specified in Column 1 of [Table H101.12](#) be not less than the distance specified in Column 2 of that Table in respect of that number of seats.

### NSW H101.12.4 Clearance between rows

The *minimum lateral clearance* between each *row* of seating must, in respect of a *row* containing a number of seats specified in Column 1 of [Table H101.12](#) be not less than the clearance specified in Column 3 of that Table in respect of that number of seats.

### NSW H101.12.5 Chairs used for seating

Chairs used for seating must comply with [NSW H101.11.2\(a\)](#) and [\(b\)](#).

### NSW H101.12.6 Egress Doorways

Egress doorways through the walls of the *auditorium*—

- (a) must have an aggregate width of at least twice the sum of the clearances specified in Column 3 of [Table H101.12](#) for each *row* of the *auditorium* to be served by those doorways; and
- (b) must be provided at each end of every fifth *row*, excluding the first 2 *rows* and the last 2 *rows* in the *auditorium* if those *rows* each contain no more than 16 seats; and
- (c) must lead—
  - (i) directly to a road or *open space*; or
  - (ii) into a foyer or other area giving access to a road or *open space*; and
- (d) must be provided with *exit* signs if the egress doorways are not sufficiently conspicuous.

### NSW H101.12.7 Clear Areas

A clear area—

- (a) must be provided from each end of each *row* to an egress doorway in the wall of the *auditorium*; and
- (b) must have a width of at least—
  - (i) the sum of the clearances specified in Column 3 of [Table H101.12](#) for each such *row*; or

- (ii) 500 mm, whichever is the greater; and
- (c) if it contains platforms or steps, must comply with [NSW H101.11.7\(a\)](#), [\(b\)](#), [\(c\)](#), [\(d\)](#) and [\(f\)](#).

### NSW H101.12.8 Minimum clear space

At the entrance from a [row](#) to a clear area, there must be a clear level floor space having a width of at least the clearance specified for the [row](#) in Column 3 of [Table H101.12](#).

### NSW H101.12.9 Doors

A door fitted to the egress doorway in the wall of an [auditorium](#) must comply with [NSW D2.15](#) and [NSW D2.19](#).

**Table H101.12 Spacing of auditorium seating**

Column 1	Column 2	Column 3
Number of seats in <a href="#">Rows</a>	Depth of <a href="#">Rows</a> (mm)	Clearance between <a href="#">Rows</a> (mm)
Not exceeding 16	950	300
17 - 30	975	325
31 - 45	1000	350
46 - 60	1025	375
61 - 75	1050	400
76 - 90	1075	425
91 - 105	1100	450
106 - 120	1125	475

### NSW H101.13 Provision of guardrails

#### NSW H101.13.1 Location

Guardrails must be provided—

- (a) along the fascia of each balcony or box;
- (b) if there is a stepped floor, along the front edge of each [cross-over](#); and
- (c) where [NSW H101.13.2](#) and [NSW H101.13.3](#) apply.