



Building Code of Australia

Design Compliance Report – Development Application

Upper Australia Exhibit and Refurbishment of Nocturnal House

Taronga Zoo - Bradley's Head Road Mosman NSW



Report Number & Revision:	MSA2080_BCA_Rev01
Prepared For:	Taronga Zoo
Date of Issue:	24.06.2020



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Revision History & Quality Management

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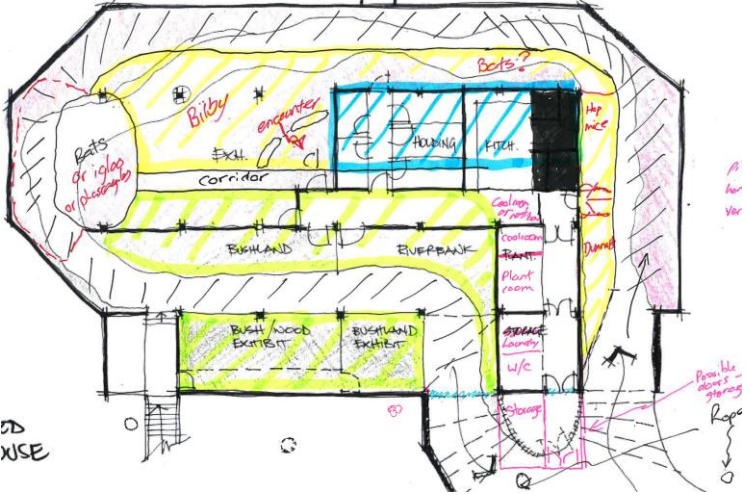
Executive Summary & Recommendations.

This report has assessed the Development Application (DA) level design documentation for the proposed 'Upper Australia' Exhibit and refurbishment of the existing Nocturnal House, at Taronga Zoo under the provisions of the Building Code of Australia (BCA).

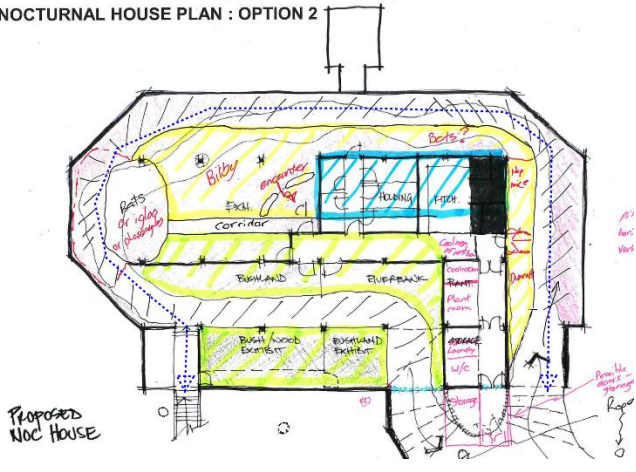
The primary purpose of the report is to assess the development design and identify any significant non-compliance matters in comparison to the current deemed-to-Satisfy (DTS) provisions of the BCA. Assessment is limited to those issues ascertainable from the current level of detail.

Subject to the recommendations contained in Section 3.0 of this report (and as detailed in the Table below), the development can readily comply with the requirements of the BCA.

Based on the reviewed design, the following matters will not comply with the deemed-to-satisfy provisions of the BCA and will need to be addressed by Design Change or Performance Solution at Construction Certification (CC) stage.

#	DTS Clause	Description of Issue.
1.	D1.4	<p>Exit Travel Distances</p> <p>Egress paths from the staff areas of the Nocturnal House will need to be confirmed/clarified (e.g. Egress from the corridor serving the Bats enclosure –can egress be provided through an enclosure?). A performance solution may need to be provided where travel distances are proposed to exceed the limitations of BCA D1.4.</p> 
2.	D1.5	<p>Distance Between Alternative Exits</p> <p>The distance between the alternative exits in the Nocturnal House (as currently proposed – see blue dotted line in plan extract below) will exceed 60m.</p> <p>A Performance Solution is proposed to address this at Construction Approval Stage.</p>



#	DTS Clause	Description of Issue.
		<p>NOCTURNAL HOUSE PLAN : OPTION 2</p> 
3.	F2.3	<p>Uni-sex Facilities</p> <p>The plans indicate that the proposed facilities are 'uni-sex'- The BCA does not permit non-accessible WC's to be unisex. It is considered that a Performance Solution can provided at CC stage to support the current design (on the assumption that full height partitions can be provided).</p>



1.0 Introduction

This report has assessed the Development Application (DA) level design documentation for the proposed 'Upper Australia' Exhibit and refurbishment of the existing Nocturnal House, at Taronga Zoo under the provisions of the Building Code of Australia (BCA).

1.1 Basis of Report

The key basis of this report is to address compliance with the significant requirements of the Building Code of Australia (BCA) and relevant disabled access provisions relevant to the new building works.

The scope of services is limited to assessment against Sections C - **Fire Resistance**, Section D - **Access & Egress** (Excluding BCA D3), Section E - **Services & Equipment**, Section F - **Health and Amenity**, Section G - **Ancillary Provisions** of the BCA.

Note an assessment of the requirements relating to 'Access for People with a Disability' is excluded from this report (Refer to separate MSA Accessibility Compliance Report).

1.2 Assessed Information

This report is based on the following:

- Desktop assessment of DA Level Architectural Plans prepared Lahznimmo Architects (*Insert Transmittal Reference*)
- The National Construction Code – Building Code of Australia (BCA), prepared by the Australian Building Codes Board.

Note: A reference to the "BCA" in this report is a reference to the Building Code of Australia 2019

- The Guide to the BCA, prepared by the Australian Building Codes Board.

1.3 Purpose of Report

The purpose of this report is to assess the following:

- Assessment of the proposed works under the current BCA and detail any significant departures (or those which have the ability to affect the current design);
- Provide recommendations to best address any significant departures from the requirements of BCA

1.4 Limitations of Report

- An assessment of the requirements relating to 'Access for People with a Disability' is excluded from this report (Refer to separate MSA Accessibility Compliance Report).
- Design changes required by Performance Solutions (made after Development Consent is granted) may necessitate further Council approval under Section 4.55 of the EP&A Act 1979.



- The assessment is limited to a desktop assessment only and has not included site assessment or physical assessment of the property in any way.
- Some requirements of the BCA are recognised as being interpretive in nature. Where these matters are encountered, interpretations are made in accordance with MSA policy. Specific relevant interpretations relevant to this assessment are included in Section 2.3 “BCA Interpretation Notes”.
- Assessment beyond the compliance matters ascertainable on the current documentation is beyond the scope of this report. Further assessment of the detailed design is recommended upon approval of the DA.
- Section J Energy Efficiency Assessment is beyond the scope of this report.
- An assessment of the provisions of BCA F1 (Damp & Weatherproofing) is not included in this report. Details would typically be provided at Construction Certificate Stage.
- Reporting on hazardous materials, OH&S matters or site contamination
- Detailed assessment of any engineering matters – e.g.: structural, electrical, hydraulic, mechanical, fire
- Heritage significance
- Environmental or planning issues
- Requirements of statutory authorities
- Provision of any Construction Certification under Part 4A of the Environmental Planning & Assessment Act 1979



2.0 Building Characteristics

2.1 Building Description

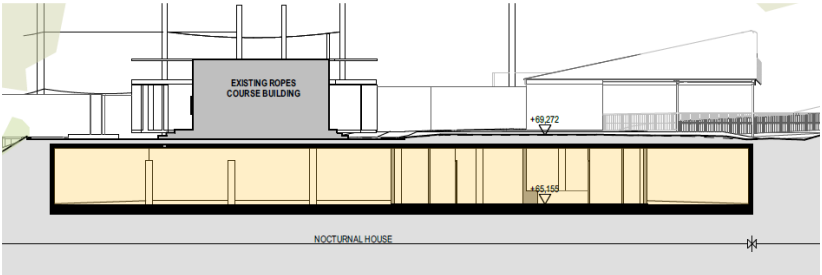
The proposed works primarily comprise:

- Internal refurbishment of the existing nocturnal house
- Construction of 'tree house' and elevated Koala Tree walk
- Construction of external walkways and accessible ramps
- Associated animal exhibits and landscaping

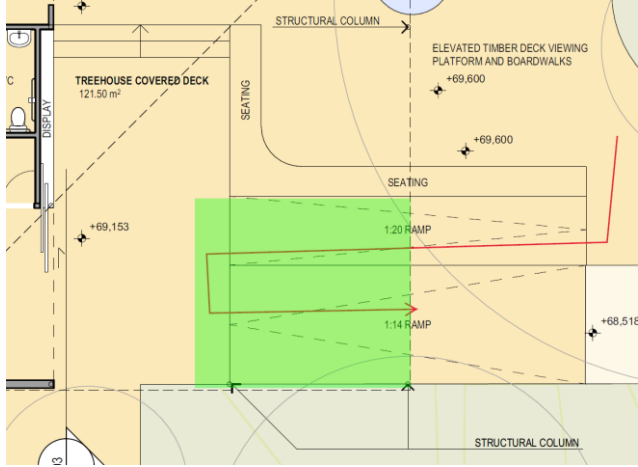
2.2 BCA Assessment Data

The following BCA assessment data is relevant to the proposal under the current BCA.

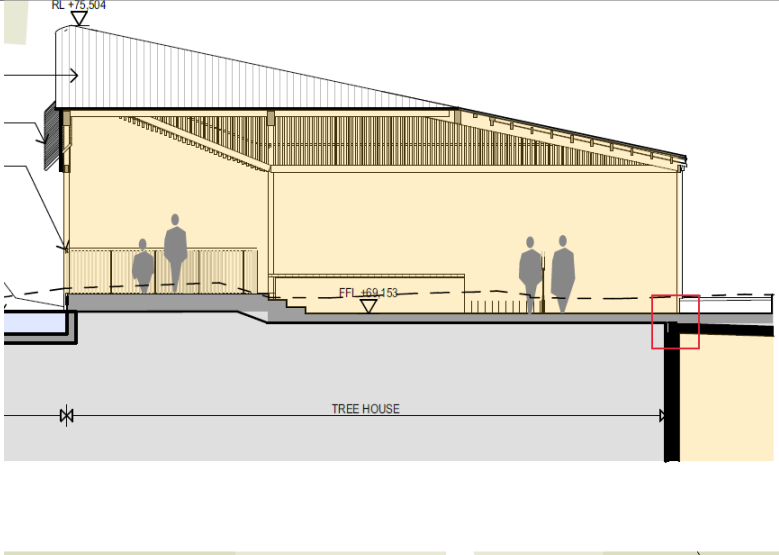
Table 2.2 BCA Assessment Data

<p>BCA Building Classification: BCA A3.2, A3.3</p>	<p>5 – Staff Areas of Nocturnal House and – Ticketing Office & Storeroom 9b – Nocturnal House – Public Areas</p>
<p>Rise in Stories BCA C1.2</p>	<p>Ticketing Office/Tree House – 1 Nocturnal House – Assumed* 1 <i>Note that the 'Ropes Course Building' sits partially over the Nocturnal House. Details for the Ropes Course Building have not been provided and it is assumed that this portion of the building comprises only a single storey above ground at any point along the external walls.</i></p> 
<p>Type of Construction BCA C1.1</p>	<p>All subject buildings are required to be of Type C as a minimum.</p>
<p>Floor Area Limitations for Type of Construction BCA C2.2</p>	<p>The size of the fire compartments (as proposed) will not exceed the limitations of Table C2.2.</p>



Effective Height	Less than 12m
Interpretation	<p>Noting the comments below, for the purposes of this assessment, the raised boardwalks are not considered to form 'outdoor occupiable areas' as referred to in BCA G6 (definition copied below), as they are not considered to be a <i>space on the roof, balcony or similar part of a building – which is not directly connected to open space.</i></p> <p>Occupiable outdoor area means a space on a roof, balcony or similar part of a building—</p> <p>(a) that is open to the sky; and</p> <p>(b) to which access is provided, other than access only for maintenance; and</p> <p>(c) that is not open space or directly connected with open space.</p> <p>Although occupants of the boardwalk are not required to re-enter a 'building' in order to reach open space, the path of travel from the boardwalk passes under the part of the covered deck area of the Treehouse before reaching an area wholly open to the sky (see area in shaded in green below). This covered area is not considered to represent a safety hazard to occupants egressing the boardwalk, although if deemed necessary by the stakeholders, an additional egress path could be provided directly from the boardwalk to 'open space'.</p> 
United Buildings	<p>The Treehouse Building appears to sit partially on/over the rear Nocturnal House (which is underground at this point – refer to section extract below). On this basis it is considered appropriate to consider the Treehouse as being part of the Nocturnal House.</p>



	
<p>Measurement of Travel Distances</p>	<p>For the purposes of this assessment, the internal parts of the animal enclosures have not been considered as 'trafficable parts' of the floor in a building and are not considered to be subject to the requirements relating to travel distance and distance.</p>



3.0 BCA / Access Assessment & Recommendations

The following table provides a 'clause by clause' assessment of the proposed development against the requirements of the BCA and relevant Disabled Access Provisions.

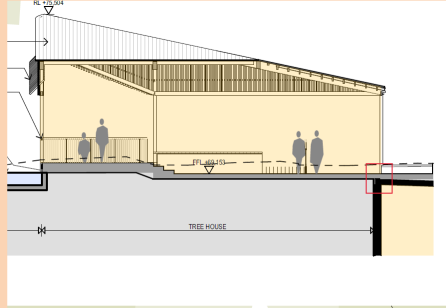
The compliance status and comment/recommendation are indicated (shaded) in the right-hand column as follows:

Complies – The design is considered to meet the requirements of the clause.
Performance Solution Proposed – This clause is proposed to be addressed by Performance Solution
Does not comply – The design does not meet the requirements of the clause OR further information is required to determine compliance OR A Performance Solution is required to address this issue.
Compliance Readily Achievable (CRA) within the constraints of the current design*
Not Applicable (NA). The clause is informational or does not apply to the subject design

**Clauses marked CRA. It should be noted that compliance with these items is not expected to necessitate significant design changes, and therefore can be addressed at Construction Certificate (CC) Stage, e.g. either in the CC architectural plans, or in a BCA Compliance Specification. Note Construction Certification will be carried out under a EP&A Act Section 6.28 Certificate.*



Table 3.0 –BCA Clause by Clause Assessment

BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
SECTION B - STRUCTURE		
Part B1 Structure	All buildings and structures should be designed by appropriately qualified structural engineers in accordance with Part B1 of the BCA and AS 1170 (SAA Loading Code), AS 1684, AS 1720, AS 2870, AS3600, AS4100 and/or other relevant structural codes.	Structural engineer to certify at Construction Certificate (CC) stage.
Clause B1.4 Glazing	All glazing must be selected and installed in accordance with AS2047 & AS1288.	A plan or spec notation to this effect is required. (at CC Stage)
SECTION C - FIRE RESISTANCE		
Part C1 Fire Resistance & Stability		
C1.1 Type of Construction Required	<p>The required type of construction is determined using Table C1.1 and depends on the rise in storeys of the building and Classification of the top storey.</p> <p>BCA Specification C1.1 provides the requirements (including Fire Resistance Levels (FRL)) for buildings elements in each type of Construction for each Classification.</p>	<p>The external walls of the proposed buildings are to be located at least 3m from (or not exposed to) any allotment boundaries or the external walls of other buildings on the allotment.</p> <p>Refer to comments in Section 2.2 of this report (The Treehouse is considered to form part of the Nocturnal House)</p>  <p>On this basis the new building elements are generally not required to achieve a FRL (note comments in BCA C2.12 below in relation to separation of equipment).</p>



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
C1.2 Calculation of Rise in Stories	Informational Clause - Provides details for how to calculate the rise in storeys	The building(s) will have a rise in storeys of 1.
C1.3 Buildings of Multiple Classifications	Informational clause relating to buildings containing more than 1 Classification.	NA to subject design.
C1.4 Mixed Types of Construction	Informational clause relating to the requirements for buildings containing more than 1 type of construction.	The building will be of Type C construction throughout
C1.5 Two Storey Class 2, 3 or 9 buildings	Provides a concession for construction type in certain Class 2, 3 and 9b buildings.	NA to subject design.
C1.6 Class 4 Parts	Provides construction type requirements for Class 4 parts	The building contains no Class 4 parts.
C1.7 Open Spectator Stands	Provides construction type requirements for buildings containing open spectator stands.	The building is not an open spectator stand.
C1.8 Lightweight Construction	Provides requirements for lightweight construction where used in fire rated walls or to protect steel columns	Any proposed fire rated lightweight construction must be confirmed as complying with Specification C1.8 by the Structural Engineer (not currently indicated on the plans). <i>Details to be provided at CC stage (Where relevant)</i>
C1.9 Non-combustible Building Elements	In a building <i>required</i> to be of Type A or B construction, the following building elements and their components must be <i>non-combustible</i> : (i) <i>External walls</i> and <i>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> .	The buildings are not required to be of Type A or B construction.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	<p>(b) A <i>shaft</i>, being a lift, ventilating, pipe, garbage, or similar <i>shaft</i> that is not for the discharge of hot products of combustion, that is <i>non-loadbearing</i>, must be of <i>non-combustible</i> construction in—</p> <p>(i) a building <i>required</i> to be of Type A construction; and</p> <p>(ii) a building <i>required</i> to be of Type B construction, subject to C2.10, in—</p> <p>(A) a Class 2,3 or 9 building; and</p> <p>(B) a Class 5,6,7 or 8 building if the <i>shaft</i> connects more than 2 <i>storeys</i>.</p> <p>(c) A <i>loadbearing internal wall</i> and a <i>loadbearing fire wall</i>, including those that are part of a <i>loadbearing shaft</i>, must comply with Specification C1.1.</p> <p>(d) The requirements of (a) and (b) do not apply to gaskets, caulking, sealants and damp-proof courses.</p> <p>(e) The following materials may be used wherever a <i>non-combustible</i> material is <i>required</i>:</p> <p>(i) Plasterboard.</p> <p>(ii) Perforated gypsum lath with a normal paper finish.</p> <p>(iii) Fibrous-plaster sheet.</p> <p>(iv) Fibre-reinforced cement sheeting.</p> <p>(v) Pre-finished metal sheeting having a <i>combustible</i> surface finish not exceeding 1 mm thickness and where the <i>Spread-of-Flame Index</i> of the product is not greater than 0.</p> <p>(vi) Bonded laminated materials where—</p> <p>(A) each lamina, including any core, is <i>non-combustible</i>; and</p> <p>(B) each adhesive layer does not exceed 1 mm in thickness and the total thickness of the adhesive layers does not exceed 2mm; and</p> <p>(C) the <i>Spread-of-Flame Index</i> and the <i>Smoke-Developed Index</i> of the bonded laminated material as a whole do not exceed 0 and 3 respectively</p>	
C1.10	Linings, materials and assemblies must be 'non-combustible' or comply with BCA Specification C1.10.	<i>Details of proposed materials linings and assemblies to be provided in the CC documentation.</i>



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
Fire Hazard Properties	<i>Note - Paint or fire-retardant coatings must not be used to achieve compliance with fire hazard properties requirements.</i>	
C1.11 Performance of External Walls in Fire	Tilt up or pre-cast concrete panels must comply with BCA Specification C1.11	The proposed design does not appear to contain tilt-up panels.
C1.12 Combustible materials	Informational clause – providing details for non-combustible materials	Noted - Informational clause only
C1.13 Fire-protected timber: Concession	<p><i>Fire-protected timber</i> in a Class 2,3 or 5 building may be used wherever an element is <i>required</i> to be <i>non-combustible</i>, provided—</p> <p>(a) the building is—</p> <p>(i) a separate building; or</p> <p>(ii) a part of a building—</p> <p>(A) which only occupies part of a <i>storey</i>, and is separated from the remaining part by a <i>fire wall</i>; or</p> <p>(B) which is located above or below a part not containing <i>fire-protected timber</i> and the floor between the adjoining parts is provided with an FRL not less than that prescribed for a <i>fire wall</i> for the lower <i>storey</i>; and</p> <p>(b) the building has an <i>effective height</i> of not more than 25 m; and</p> <p>(c) the building has a sprinkler system throughout complying with Specification E1.5; and</p> <p>(d) any insulation installed in the cavity of the timber building element <i>required</i> to have an FRL is <i>non-combustible</i>; and</p> <p>(e) cavity barriers are provided in accordance with Specification C1.13.</p>	Noted - Informational clause only



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
C1.14 Ancillary elements	<p>An <i>ancillary element</i> must not be fixed, installed or attached to the internal parts or external face of an <i>external wall</i> that is <i>required</i> to be <i>non-combustible</i> unless it is one of the following:</p> <ul style="list-style-type: none"> (a) An <i>ancillary element</i> that is <i>non-combustible</i>. (b) A gutter, downpipe or other plumbing fixture or fitting. (c) A flashing. (d) A grate or grille not more than 2m² in area associated with a building service. (e) An electrical switch, socket-outlet, cover plate or the like. (f) A light fitting. (g) A <i>required</i> sign. (h) A sign other (refer to clause for concessions) (i) An awning, sunshade, canopy, blind or shading hood (refer to clause for concessions) 	NA as the buildings are not required to be of Type A or B construction.
Part C2 Compartmentation & Separation		
C2.2 General Floor Area & Volume Limitations	Floor areas and volumes of fire compartments must be in accordance with BCA Table C2.2.	Floor areas and volumes of fire compartments are less than the maximum allowed for Type C construction.
C2.3 Large Isolated Buildings Note requirements of NSW C2.3	Provides concessions from the fire compartment floor area and volume limitations of BCA C2.2 for 'large isolated buildings'.	The building is not considered to be a 'large isolated building'.
C2.4 Requirements for Open Space	Provides requirements for open space and vehicular access for large isolated buildings	As above



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
& Vehicular Access		
C2.5 Class 9a & 9c Buildings	<p>Class 9a and 9c buildings are subject to further requirements in terms of smoke and fire compartmentation.</p> <p>Note BCA NSW C2.5 contains variations to this clause (Applicable in NSW)</p>	The building is not a Class 9a or 9c building
C2.6 Vertical Separation of openings in external walls	<p>In buildings required to be of Type A construction, openings in external walls are required to be protected with vertical spandrels or horizontal slabs to prevent fire from spreading from a storey below.</p> <p>Vertical separation must be in the form of:</p> <ul style="list-style-type: none"> • 'Vertical spandrels' which must be non-combustible, have a FRL of at least 60/60/60, and a height of at least 900mm. At least 600mm must be above the surface of the intervening floor; OR • Horizontal Slab separation (e.g. balcony) – which must have a FRL of not less than 60/60/60 and extend outwards of the opening not less than 1100mm and horizontally not less than 450mm from the side of the opening. 	NA – the building is not required to be of Type A construction.
C2.7 Separation by Fire Walls	Provides the requirements for fire wall construction.	See comments in C2.8 below.
C2.8 Separation of Classifications in the same storey	<p>Where a building has different Classifications in the same storey:</p> <ul style="list-style-type: none"> • The Classifications must be separated by a fire wall (with the 'higher' FRL); OR • The entire storey must be constructed to the 'higher FRL' 	The buildings are required to be of Type C construction (so are inherently building the 'higher FRL').
C2.9 Separation of Classifications in different stories	<p>Where a building contains different Classifications and one Classification is situated above, they must be fire separated as follows:</p> <p>a) Type A Construction – the separating floor must achieve the required FRL (under BCA Spec C1.1) for the lowest storey</p>	The buildings are required to be of Type C construction and do not contain any Class 2-4 parts).



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	b) Type B/C Construction – where one of the Classifications is 2/3/4, the separating floor must achieve a FRL of 30mins, RISF not less than 60mins or be lined to the underside with a 'fire protective covering'	
C2.10 Separation of lifts shafts	<p>The following lift shafts are required to achieve a FRL:</p> <p>a) General - lifts connecting more than 2 storeys b) Lifts in Class 9a or 9c buildings c) 'Emergency Lifts'</p> <p>Openings for landing doors and services must be protected in accordance with the requirements of BCA Part C3.</p>	NA to subject design.
C2.11 Stairways and lifts in one shaft	Stairs and lifts must not be in the same shaft if either is required to be 'fire isolated'	As above.
C2.12 Separation of Equipment	<p>The following equipment is required to be fire separated from the remainder of the building:</p> <ul style="list-style-type: none"> • Lift motors or control panels • Emergency generators for emergency equipment • Central smoke control plan • Boilers • Batteries (>24V & exceeding 10 ampere hours) • Fire pumps 	<p>Any equipment specified by this clause must be separated by 120/120/120 construction, including boilers, batteries, diesel pumps etc.</p> <p>Full details of equipment to be provided (<i>note that a fire hydrant pump room required to be fire separated from the remainder of the building</i>)</p> <p><i>Details to be submitted at CC stage.</i></p>
C2.13 Electrical Supply	Substations, main switchboards (where sustaining emergency equipment) and certain electrical conductors must be fire separated from the remainder of the building.	<i>Details to be submitted at CC stage (where relevant)</i>
C2.14 Public corridors in Class 2 & 3 Buildings	Where 'public corridors' in a Class 2 or 3 building exceed a length of 40m, they must be subdivided into smoke compartments (at intervals of not more than 40m).	NA to subject design.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
Part C3 Protection of Openings		
C3.2 Protection of openings in external walls Note NSW C3.2 ((a) deleted)	Openings in external walls of buildings must be protected in accordance with BCA C3.4 where they are: <ul style="list-style-type: none"> • Less than 3m from an allotment boundary (other than the boundary of a road, river or lake etc); or • 6m from the far side of a boundary with road, river or lake etc; or • 6m from the external wall of another building on the allotment 	The openings in the external walls are typically setback at least 3m from fire source features.
C3.3 Separation of external walls and associated openings in different fire compartments	External walls (and associated openings) of different fire compartments must be fire rated/protected where they are exposed to one another (refer to Table C3.3)	NA to subject design.
C3.4 Acceptable Methods of Protection	Openings required to be protected under Clause C3.2 (or C3.3) above must be protected as follows: <p>(i) Doorways—</p> <p>(A) internal or external wall-wetting sprinklers as appropriate used with doors that are self-closing or automatic closing; or</p> <p>(B) /60/30 fire doors that are self-closing or automatic closing.</p> <p>(ii) Windows—</p> <p>(A) internal or external wall-wetting sprinklers as appropriate used with windows that are automatic closing or permanently fixed in the closed position; or</p> <p>(B) /60/ fire windows that are automatic closing or permanently fixed in the closed position; or</p> <p>(C) /60/ automatic closing fire shutters.</p>	Informational clause



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	<p>(iii) Other openings—</p> <p>(A) excluding voids — internal or external wall-wetting sprinklers, as appropriate; or</p> <p>(B) construction having an FRL not less than /60/.</p> <p>(b) Fire doors, fire windows and fire shutters must comply with Specification C3.4.</p>	
C3.5 Doorways in Fire Walls	<ul style="list-style-type: none"> The aggregate width of doorways in fire walls must not exceed ½ of the length of the fire wall. The doorways can be protected with 1 or 2 doors to achieve the required FRL Doors must be self or automatic closing 	Refer to comments in Clause C2.8 above.
C3.6 Sliding Fire Doors	Sliding fire doors must automatically close in accordance with this clause and be provided with warning signage	There are no sliding fire doors proposed.
C3.7 Protection of Doorways in horizontal exits	<p>Doors in horizontal exits must achieve the same FRL as that of the fire wall</p> <p>Doors must be self or automatic closing</p>	There are no horizontal exits proposed.
C3.8 Openings if fire isolated exits	<p>Doorways serving the fire isolated exit must be protected with a self-closing fire door achieving a FRL of not less than -/60/30.</p> <p>Where the window in the external wall of a fire isolated exit is within 6m and exposed to a window or other opening in a wall of the same building it must be protected externally in accordance with Clause C3.4.</p>	NA to subject design.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
C3.9 Service Penetrations in fire-isolated exits	Service penetrations in fire exits must comply with this clause. Generally, only electrical wiring and water supply pipes for fire services are permitted within the exits.	NA to subject design.
C3.10 Openings in Fire isolated lift shafts	<p>The entrance doorways must be protected with fire doors (achieving a FRL of not less than -/60/- which comply with AS1735.11 and are set to remain in the closed position (except when discharging or receiving passengers)</p> <p>The lift indicator panels and the like must be backed with construction achieving a FRL of not less than -/60/60 – if it exceeds an area of 35,000mm²</p>	NA to subject design.
C3.11 Bounding Construction	<p>Applies to Class 2 and 3 buildings and Class 4 parts</p> <p>The entrance doorways of the sole occupancy units, or from other rooms which open onto a public corridor must be protected with a self-closing fire door achieving a FRL of not less than -/60/30.</p> <p>In a Class 2 or 3 building, where the path of travel to an exit does not provide a person seeking egress with a choice of travel in different directions to alternative exits and is along an open balcony, landing or the like and passes the external wall of another unit or other room, then that wall must be fire rated and openings protected internally.</p> <p>Note NSW C3.11 Bounding Construction: Class 2, 3, 4 and 9b buildings</p>	NA to subject design.
C3.12 Openings in floors and ceilings for services	Services penetrations must be protected in accordance with this clause. See C3.15 below also.	<i>Details to be submitted at CC stage.</i>
C3.13 Openings in Shafts	Openings in shafts required to be fire rated to be protected in accordance with this Clause.	<i>Details to be submitted at CC stage.</i>

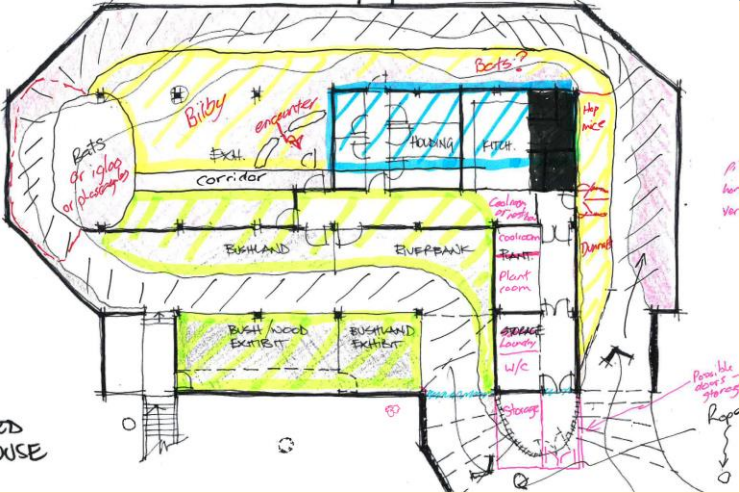


BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
C3.15 Openings for Service Installations	<p>Services must be protected against the spread of fire when penetrating any building element that is required to be fire-rated (i.e., separating floor/wall/shaft).</p> <p>All cable penetrations through floors or fire walls must be fire stopped in accordance with BCA C3.15 and AS1530.4.</p>	<i>Details to be submitted at CC stage.</i>
C3.16 Construction Joints	Fire-rated mastic or other approved product tested to AS1530.4 is required to seal gaps in fire rated construction.	<i>Details to be submitted at CC stage.</i>
C3.17 Columns protected in lightweight construction to achieve FRL	Columns protected in lightweight construction which penetrate a building element required to achieve a FRL or a RISF must be installed using a method and materials identical with a prototype assembly of the construction which has achieved the required FRL or RISF.	<i>Details to be submitted at CC stage.</i>
SECTION D ACCESS & EGRESS		
Part D1 Provision for Escape		
D1.2 Number of Exits required Note NSW D1.2	<p>At least one exit must be provided from each storey of every building</p> <p>At least 2 alternative exits must be provided from:</p> <ul style="list-style-type: none"> • Every storey of a building which has an effective height of more than 25m • Basement storeys where egress from the building involves a vertical rise of 1.5m or more (some small basements provided with an exemption) • Class 8 buildings with a rise in storeys of more than 6 • A storey which contains a 'patient care area' • A storey which contains sleeping areas in a Class 9c building • Every storey in a child care centre • Each storey of a primary/secondary school with a rise in storeys of 2 or more 	The design generally complies.

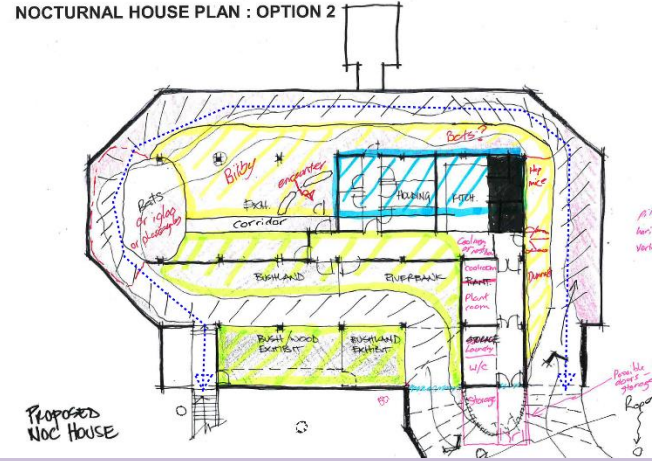


BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	<ul style="list-style-type: none"> Any storey in a Class 9 building which accommodates more than 50m <p>Additional requirements apply to Class 9a and 9c buildings and to open spectator stands.</p> <p>Egress is not permitted to be provided through another sole occupancy unit.</p>	
D1.3 When Fire Isolated exits are required	<p>Exits are required to be fire isolated depending on the Classification of the building and number of storeys connected.</p> <p>The following general requirements apply (exits are required to be fire isolated in the following circumstances):</p> <ul style="list-style-type: none"> Class 2 buildings – 3 consecutive storeys Class 3 buildings – 2 consecutive storeys Class 5-9 buildings (2 consecutive storeys) Class 9a (patient care parts) & 9c buildings – all exits to be fire isolated. 	NA to subject design.
D1.4 Exit Travel Distances	<ul style="list-style-type: none"> Class 2 & 3 buildings <ul style="list-style-type: none"> The distance between the entrance door of a Sole Occupancy Unit (SOU) and an exit or Point of Choice (POC) to 2 alternative exits must not exceed 6m (20m on ground floor) From all parts not in a SOU – 20m to exit or POC Class 4 buildings – entrance door of SOU to exit or POC must not exceed 6m Class 5, 6, 7, 8 or 9 buildings – 20m to exit or POC <p>Additional requirements apply to Class 9 buildings, and open Spectator stands</p>	Egress paths from the staff areas of the Nocturnal House will need to be confirmed/clarified (e.g. Egress from the corridor serving the Bats enclosure –can egress be provided through an enclosure?). A performance solution may need to be provided where travel distances are proposed to exceed the limitations of BCA D1.4.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
		
<p>D1.5 Distance Between Alternate Exits Note NSW D1.6</p>	<p>Alternative exits must:</p> <ul style="list-style-type: none"> • Be not less than 9m apart • Be not more than 45m apart in a Class 2 or 3 building (or patient care area in a Class 9a building) • Be not more than 60m apart in any other case • Be located so that alternative paths of travel do not converge to be less than 6m apart. 	<p>The distance between the alternative exits in the Nocturnal House (as currently proposed – see blue dotted line in plan extract below) will exceed 60m.</p> <p>A Performance Solution is proposed to address this at Construction Approval Stage.</p>



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
		
D1.6 Dimensions of Exits and paths of Travel to Exits	Exits and paths of travel to exits are required to be unobstructed for a width of no less than 1000mm wide and a height of no less than 2000mm – see D2.17 also. Additional exit width must be provided where the storey or part accommodates more than 100 people, or is in a Class 9a or 9c building.	General – egress paths must be not less than 1m wide, with exit doors to be not less than 750mm clear. (note that doors in an accessible pathway must be not less than 850mm clear - refer to Part D3 of the report for further details) Details to be provided at CC stage.
D1.7 Travel via Fire Isolated Stairs	<ul style="list-style-type: none"> Doors from rooms must not open directly into a fire isolated exit (unless the room is a public corridor, lobby, SOU occupying the whole of storey, or sanitary compartment. Fire isolated exists must provide independent egress from each storey served and discharge directly to: <ul style="list-style-type: none"> A road or open space A covered area of the building which is suitably open 	NA to subject design.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	<ul style="list-style-type: none"> Where a path of travel from a fire isolated exit involves passing within 6m of the external wall of the building, the external wall must be fire rated and openings protected in accordance with BCA C3,4. 	
D1.8 External Stairways or ramps in lieu of Fire Isolated Stairs	This clause permits external stairways to be used in lieu of fire isolated exits – providing the external stairs are suitably protected.	As above.
D1.9 Travel by non-fire-isolated stairs	<ul style="list-style-type: none"> Non-fire-isolated exits serving as a required exit must provide a continuous measure of travel by its own flights and landings to the level at which egress to a road or open space is provided. The distance between the doorway of an SOU and the point of egress to a road or open space must not exceed – 30m (Type C construction) or 60m in any other case. The distance between any point on the floor and the point of egress to road/open space in a Class 5, 6, 7, 8 or 9 building must not exceed 80m. The distance between the point of discharge of a non-fire isolated stair and a doorway leading to road open space must not exceed 15m for Class 2 or 3 buildings, or 20m for Class 5, 6, 7, 8 or 9 buildings In Class 2 or 3 buildings – non-fire isolated exits must provide separate egress to road/open space and be smoke separated at the level of discharge. 	Travel via the non-fire isolated stairs serving the Nocturnal House is generally in accordance with this clause.
D1.10 Discharge from Exits Note NSW D1.10	<p>Barriers must be provided where necessary to prevent exits being obstructed by vehicles.</p> <p>The path of travel between an exit and the street must be not less than 1m wide and be provided with stairs and or ramps complying with BCA Part D2/D3</p> <p>Additional requirements apply to Class 9b building/open spectator stands.</p>	The path of travel from the building exits to the street is existing and not proposed to be affected by the proposed development.
D1.11 Horizontal Exits	<ul style="list-style-type: none"> Horizontal exits must not be used between SOUs or from a childcare centre or primary/secondary school. 	There are no horizontal exits relied upon for the purposes of this assessment.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	<ul style="list-style-type: none"> Sufficient space must be allocated on either side of the fire wall serving as a horizontal exit. Additional requirements apply in Class 9a or 9c buildings. 	
D1.12 Non-required stairways, ramps or escalators	<ul style="list-style-type: none"> Non-fire-isolated stairs, ramps or escalators must not connect more than 2 consecutive storeys (or 3 consecutive storeys in a sprinkler protected building)- assuming one of the storeys connected provides direct egress to road/open space. Some exemptions apply to open spectator stands, stadiums, carparks and external stairs. Additional requirements apply in Class 9a or 9c buildings. 	There are no non-required stairs/ramps in the subject development.
D1.13 Number of Persons Accommodated	Provides methods for calculating number of occupants for different building uses.	Informational clause only.
D1.14 Measurement of Distances	Provides details for how to measure distances for exits.	Informational clause only.
D1.15 Method of Measurement	Provides further details for how to measure egress distances.	Informational clause only.
D1.16 Plant Rooms and lift Motor Rooms: Concession	Provides concessions for egress requirements in certain plantrooms.	Informational clause only.
D1.17 Access to lift pits	Provides requirements for access/egress to/from lift pits.	There are no lift pits indicated on the plans.
Part D2 Construction of Exits		
D2.1 Application of Part	With the exception of certain clauses (relating to stair construction, handrails, balustrades, door hardware and window fall protection, this Part does not apply to the internal parts of a SOU in residential buildings.	Informational clause only.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
Note NSW D2.1		
D2.2 Fire-Isolated stairways and ramps	The fire isolated stairs must be of non-combustible construction and be design such that if there is local failure it will not cause structural damage to or impair the fire resistance of the shaft.	NA to subject design.
D2.3 Non-fire Isolated stairways and ramps	Non-fire isolated stairs/ramps in a building having a rise in storeys of more than 2 are required to be constructed in concrete, 6mm steel or 44mm thick timber (additional requirements apply in relation to glue and timber density).	Non-fire isolated stairs are concrete.
D2.4 Separation of Rising and Descending Stairs	In a fire isolated stair, rising and descending stair flights must be physically separated by non-combustible smoke proof construction.	NA to subject design.
D2.5 Open Access ramps and balconies	Provides requirements for open access ramps/balconies which are provided to meet smoke hazard management requirements of BCA E2.2a.	There are no open access ramps or balconies required to be provided for smoke hazard management.
D2.6 Smoke Lobbies	Provides requirements for smoke lobbies (where required by BCA D1.7)	Smoke lobbies are not required to be provided.
D2.7 Installations in Exits and Paths of Travel	<ul style="list-style-type: none"> Electrical distribution and telecommunications, boards etc. where located in a path of travel to an exit, must be enclosed in non-combustible construction, with openings suitably smoke sealed. Gas services must not be located in a required exit Wiring associated with fire, security, lighting may be installed in a fire isolated exit Access to service shafts (other than for fire services) must not be provided from a fire isolated exit. 	<i>Details to be provided at CC stage.</i>
D2.8 Enclosure of Space Under Stairs and ramps	<ul style="list-style-type: none"> The space below a fire isolated stairway must not be enclosed for form a storage cupboard or similar. 	NA to subject design.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	<ul style="list-style-type: none"> The space below a non-fire-isolated exit may be enclosed, providing the enclosure achieves a FRL of at least 60/60/60 & the access doorway is protected with a self-closing fire door 	
D2.9 Width of Stairs	Informational clause confirming that a required stairway which exceeds a width of 2m is only counted as having a width of 2m – unless intermediate handrails/barriers are provided.	Informational clause only.
D2.10 Pedestrian Ramps	<ul style="list-style-type: none"> Fire isolated ramps may be used in lieu of fire isolated stairways Ramps must not exceed a grade of 1:14 where required to be 'accessible', or 1:8 in any other case. Ramp surface must be slip resistant. 	<i>Details to be provided at CC stage.</i>
D2.11 Fire-Isolated Passageways	Fire isolated passageways must generally achieve a FRL consistent with the stair/ramp to which it is connected OR 60/60/60 in any other case.	There are no fire isolated passageways currently proposed.
D2.12 Roof as Open Space	If an exit discharges to the roof of a building, the roof must achieve a FRL of 120/120/120 and not contain any openings/rooflights etc within 3m of the path of travel.	The roof is not proposed to be used as open space.
D2.13 Goings & Risers Note NSW D2.13	Stairways must have: <ul style="list-style-type: none"> A minimum 2 risers (single steps not permitted), and maximum 18 risers in each flight Going/riser/quantity dimensions in accordance with BCA Table D2.13 Constant riser/going dimensions (variation 5mm between treads and 10mm overall permitted) Risers which will not permit a 125mm sphere to pass through Slip resistant treads Required exits must not contain winders in lieu of a quarter landing (up to 3 winders in a quarter landing are permitted in non-required stairs and in residential SOUs') Solid treads required where stair exceed 10m in height or 3 storeys In a Class 9b building – not more than 36 risers are permitted in consecutive flights without a change in direction of at least 30 degrees 	<i>Details to be provided at CC stage.</i>
D2.14 Landings	<ul style="list-style-type: none"> Landings must have a grade not steeper than 1:50 Be not less than 750mm long 	Landings appear to be provided as required, however full details should be provided at CC stage.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	<ul style="list-style-type: none"> Be slip resistant as per BCA Table D2.14 	<i>Details to be provided at CC stage.</i>
D2.15 Thresholds Note NSW D2.15	Internal doorways must not contain a step/ramp within the door threshold A single 190mm step is typically permitted for external doorways which are not required to be accessible. Accessible doorways must be provided with a threshold ramp or landing + step ramp in accordance with AS1428.1 Additional requirements apply to Class 9a/9c buildings	<i>Details to be provided at CC stage.</i>
D2.16 Balustrades and other Barriers Note NSW D2.16	The following general requirements are applicable <ul style="list-style-type: none"> Balustrades to balconies and landings must be not less than 1,000mm in height Balustrades to the sides of stairs must be not less than 865mm high, measured along the nosing line Balustrades must not have any openings which would allow a 125mm sphere to pass through Balustrades serving a floor which is more than 4m above the surface beneath must not incorporate 'climbable elements' in the zone between 150mm and 760mm above the floor Balustrades are also required to operable windows where the sill height is less than 865mm and it is possible for a person to fall more than 4m. Balustrades in fire isolated stairs must comply with BCA Clause D2.16 (g) & (h) (i) (no opening >300mm & where rails are used the rail must not permit a 150mm sphere to pass through the nosing line and the bottom rail, openings between rails not to exceed 460mm) 	<i>Details to be provided at CC stage.</i>
D2.17 Handrails	A handrail is required to at least one side of every stairway or ramp (and to both sides where the stair has a width of 2m or more) Handrails must be at a height of not less than 865mm above the stair nosing line (additional handrail at 665-750mm to be provided in primary schools)	<i>Note the additional handrail requirements in Part D3 (Refer to MSA Accessibility Report for further details).</i> <i>Full details to be provided at CC stage.</i>



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	<p>The handrail must be continuous between stair flight landings and have no obstructions that will tend to break a hand-hold (except for newel posts, ball type sanctions or the like).</p> <p>Handrails required to assist people with disabilities must comply with BCA D3.3.</p> <p>In a required exit, the handrail must comply with Clause 12 of AS1428.1. This typically requires the handrail to have a continuous height to the stair nosing line & around landings, and also incorporate extensions/terminations at the top and bottom as per AS1428.1.</p> <p>Additional requirements apply to Class 9a and 9c buildings.</p>	
D2.18 Fixed Platforms, walkways and ladders	Informational clause only noting fixed platforms, walkways and ladders for access can be in accordance with AS1657 to service/plant areas or in low-use areas in a residential SOU.	Informational clause.
D2.19 Doorways & Doors Note NSW D2.19	<ul style="list-style-type: none"> Doors in required exits must not be fitted with roller shutters/tilt up doors (except in Class 6-8 SOUS with a floor area of not more than 200m², and where only one exit is required, and the door is held open when in use. Doors in required exits must not be sliding unless the door leads directly to road/open space (and can be manually opened with force less than 110 N) Where power operated doors are provided they must open automatically on power failure or fire alarm trip. Additional requirements apply to Class 9a and 9c buildings. 	Swinging or sliding doors are typically proposed as required.
D2.20 Swinging Doors	<ul style="list-style-type: none"> Swinging egress doors must not impede/obstruct egress width within an exit Doors must generally swing in the direction of egress (except where serving parts of the building with a floor area of 200m²) 	The final egress doors and doors serving as exits swing in the direction of egress as required (on the assumption that the total floor area of the staff/back of house area (excluding exhibits) in Nocturnal House is less than 200m ²)



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
D2.21 Operation of Latch Note NSW D2.21	<ul style="list-style-type: none"> Exit doors and doors in a path of travel to an exit must generally be readily operable without a key from the side that faces a person seeking egress by a single handed downward action or pushing action on a single device which is located between 900mm and 1100mm above the floor. Some concessions are provided to certain buildings – including doors in a residential SOU, childcare centers, banks, jails, mental health facilities. Doors which open automatically on the activation of a fire trip are also provided with a concession under this clause. Additional requirements apply to assembly buildings accommodating more than 100 people (which generally requires that panic bars be provided) 	Details to be provided at CC stage.
D2.22 Re-entry from Fire isolated exits	<p>Doors in fire isolated exits in Class 9a/9c buildings and buildings with an effective height exceeding 25m must not be locked from the inside of the exit.</p> <p>Some exemptions can be applied where security measures are implemented.</p>	NA to subject building
D2.23 Signs on Doors	Signage must be provided to fire exit doors.	NA to subject building
D2.24 Protection of openable windows	<p>This clause applies to all windows serving a bedroom in the Class 2/3/4 buildings and in Class 9b buildings.</p> <p>Where the window (serving a floor more than 2m from the surface beneath) has a sill height of less than 1.7m, the openable portion of the window must be fitted with:</p> <p>A device to restrict the window openings; or A screen with secure fittings (<i>refer to Clause D2.24 for requirements</i>)</p> <p>Note balustrading may also be required to windows.</p>	NA to subject building



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
D2.25 Timber Stairways: Concession	Provides a concession allowing timber stairways to be used in fire exits subject to protective measures being provided.	Informational Clause
SECTION E SERVICES & EQUIPMENT		
Part E1 Fire Fighting Equipment		
E1.3 Fire Hydrants	<p>Where the floor area of a building is considered over 500m² (and the fire brigade is available to attend a fire), the building must be provided with Fire Hydrant coverage in accordance with BCA E1.3 and AS2419.1.</p> <p>Attention should be paid to the location of the fire hydrant pump room (<u>which is required to be accessed via open space or from a fire isolated exit</u>). The pump room is also required to be fire separated from the remainder of the building in construction achieving a FRL of not less than 120/120/120.</p> <p>Attention should also be paid to the location of the booster – which is required to be not less than 10m from the building (or in a shielded part of the external wall) and in site of the main entrance to the building. As the building has more than 1 main entrance – advice from a hydraulic consultant and/or Fire and Rescue NSW should be sought (as the location of the booster may have an impact on the current design).</p>	<p><i>A fire hydrant system must be provided to the Nocturnal House (and Treehouse). The fire services consultant must confirm that the building is provided with a hydrant system in accordance with this Clause (or in accordance with the existing standard of installation).</i></p>
E1.4 Fire Hose Reels	<p>Where the building is provided with an internal fire hydrant system or incorporates a fire compartment with a floor area of more than 500m², it must be provided with a fire hose reel system in accordance with BCA E1.4 and AS2441.</p> <p>Note that fire hose reels are not required in a:</p> <ul style="list-style-type: none"> • Class 2/3/4 building • Class 8 electrical substation 	<p><i>A fire hose reel system must be provided to the Nocturnal House.</i></p> <p><i>The fire services consultant must confirm that the building is provided with a hydrant system in accordance with this Clause (or in accordance with the existing standard of installation).</i></p>



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
	<ul style="list-style-type: none"> Class 9c building Class 9b primary or secondary school Classrooms/corridors. 	
E1.5 Sprinklers	<p>A building must be provided with a sprinkler system complying with BCA E1.5, Specification E1.5 and AS2118.1 - where required by BCA Table D1.5. The following buildings typically required sprinkler systems:</p> <ul style="list-style-type: none"> Buildings with an effective height of more than 25m Class 3/9a buildings used as residential aged care Class 6 buildings with floor area of more than 3,500m² or volume of 21,000m³ Class 7a (non-open deck) carparks accommodating more than 40 vehicles Certain Class 9b buildings, large isolated buildings and containing an atrium Buildings with a floor area of more than 2000m² or volume of more than 12,000m³ and containing an 'excessive hazard' 	A sprinkler system is not required to be provided under this Clause.
E1.6 Portable Fire Extinguishers	Portable fire extinguishers must be provided throughout the building in accordance with BCA E1.6, Table E1.6 and AS2444.	<i>Details to be submitted at CC stage.</i>
E1.8 Fire Control Centre	A fire control centre in accordance with BCA Specification E1.8 is required to be provided in a building with an effective height of more than 25m or a Class 6-9 building with a floor area exceeding 18,000m ²	A fire control centre is not required to be provided in the subject building.
E1.9 Fire Precautions during construction	Buildings under construction are required to be provided with portable fire extinguisher and hydrant coverage.	<i>Details to be submitted at CC stage.</i>
E1.10 Provision for Special Hazards	Suitable additional provision must be made for firefighting where it is considered that the building incorporates a <i>special hazard</i> .	It is assumed that the building will not incorporate any additional hazards.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
Part E2 Smoke Hazard Management		
E2.2 General Requirements Note: NSW Table E2.2b Specific Provisions Note NSW Specification E2.2a Smoke Detectors and Alarms Systems	Buildings must be provided with smoke hazard management in accordance with BCA Table E2.2a (and BCA E2.2b for certain Class 6 & 9b buildings)	The building is required to be provided with the following in relation to smoke hazard management: <ol style="list-style-type: none"> 1. The building must be provided with a smoke detection and alarm system & building occupant warning system in accordance with Specification E2.2a (Clause 4). 2. Mechanical ventilation systems on the Nocturnal House must be provided with a system of automatic shutdown as per BCA NSW E2.2b <p><i>An electrical/fire services engineer (as appropriate) should provide design details and certification at CC stage.</i></p>
E2.3 Provision for Special Hazards	Suitable additional provision must be made for smoke hazard management where it is considered that the building incorporates a <i>special hazard</i> .	It is assumed that the building will not incorporate any additional hazards.
Part E3 Lift Installations		
E3.2 Stretcher Facility in Lifts	Stretcher facilities comprising a space which is able to accommodate a patient lying on it horizontally by providing a clear space not less than 600mm wide x 2000mm long x 1400mm high.	NA to subject design.
E3.3 Warning Against the use of lifts in Fire	Warning signage must be provided near every call button for the lifts in accordance with this Clause. The sign must state: "DO NOT USE LIFTS IF THERE IS A FIRE" In 10mm high capital letters or 8mm high lower-case letters	NA to subject design.
E3.4 Emergency Lifts	Emergency lifts are required to be provide in buildings with an effective height of more than 25m and in certain Class 9a buildings.	NA to subject design.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
E3.5 Landings	Access and egress via the lift landings must comply with the DTS provisions of Section D.	
E3.6 Passenger Lifts	The lifts in 'accessible areas' must be one of the types identified in Table E3.6a and have accessible features in accordance with Table E3.6b, and not rely on a constant pressure device for its operation if the lift car is fully enclosed.	
E3.7 Fire Service Controls	Where lifts serve a storey with an effective height of more than 12m – fire service controls must be provided.	
E3.8 Aged Care Buildings	Upper levels of Class 9c aged care buildings must be provided with a lift with stretcher facilities or a ramp complying with AS1428.1 – which discharges to the level of road/open space.	
E3.9 Fire Service Recall Operation Switch	Where a lift is required to be provided with fire service controls under BCA E3.7 – fire service recall switch must be provided in accordance with this Clause	
E3.10 Lift car service drive control switch	Where a lift is required to be provided with fire service controls under BCA E3.7 – fire service drive control switch must be provided in accordance with this Clause	
Part E4 Visibility in and Emergency, Exit Signs and Warning Systems		
E4.2 Emergency Lighting Requirements	Emergency lighting in accordance with AS2293.1 must be provided in: <ul style="list-style-type: none"> • Fire exits • Class 5- 9 buildings with floor area exceeding 300m² • Egress pathways in Class 2-4 buildings • Non-fire isolated stairs • Certain Class 9 buildings • Fire control rooms 	<i>Design Engineer to certify their design meets BCA and AS2293.1 at CC stage.</i>
E4.3 Measurement of Distance	Informational clause relating to method of measurement.	Informational

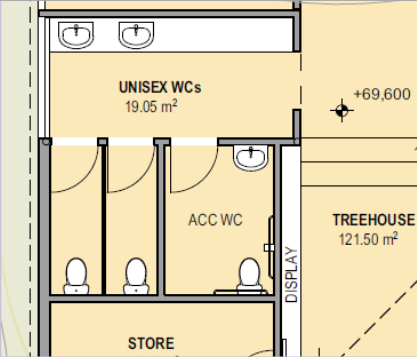


BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
E4.4 Design and Operation of Emergency Lighting	Emergency lighting systems must comply with AS2293.1	See E4.2.
E4.5 Exit Signs	Exit signs must be provided to: <ul style="list-style-type: none"> • Doors leading to internal and external stairs/ramps serving as a required exit • Horizontal exits • A door serving as or in a required exit in an area required to be provided with emergency lighting under BCA E4.2 	<i>Design Engineer to certify their design meets BCA and AS2293.1 at CC stage.</i>
E4.6 Direction Signs NSW E4.6 Direction Signs	Where an exit is not apparent to an occupant, directional signage is required to be installed.	<i>Design Engineer to certify their design meets BCA and AS2293.1 at CC stage.</i>
E4.7 Class 2 & 3 Buildings & Class 4 Parts: Exemption	Provides a concession from BCA E4.5 to doors in Class 2-4 buildings provided with non-illuminated exit signage.	The exemptions allowed by this clause are noted and can be applied to the Class 2/3 parts.
E4.8 Design & Operation of Exit Signs	Exit signage must comply with AS2293.1 (and BCA Specification E4.8 for photoluminescent exit signs)	Informational clause only.
E4.9 Sound Systems and Intercom Systems for Emergency Purposes	A sound system and intercom system for emergency purposes (SISEP) complying with AS1670.3 is required to be provided in: <ul style="list-style-type: none"> • building has an effective height of not more than 25m. • a Class 3 building having a rise in storeys of more than 2 and used as a residential part of a school or accommodation for the aged/children or people with a disability • Class 3 building used as a residential aged care building • Certain Class 9a and 9b buildings 	Not required in subject building.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
SECTION F HEALTH & AMENITY		
Part F2 Sanitary & Other Facilities		
F2.1 Facilities in residential buildings	Facilities must be provided to residential buildings as follows: <ul style="list-style-type: none"> • Class 2, 4 & 9c buildings – kitchen, bath/shower, WC, washbasin & laundry facilities + WC & washbasin for employees where >10 SOU's are provided • Class 3 buildings – bath/shower 	NA to subject design.
F2.2 Calculation of number of occupants and fixtures	<ul style="list-style-type: none"> • Number of occupants to be calculated as per BCA D1.13 • Sanitary facilities to be generally provided assuming a 50:50 male:female split • A unisex accessible sanitary facility can be counted once for each sex 	Informational clause only.
F2.3 Facilities for Class 3 to 9 Buildings	Facilities to be provided in accordance with BCA F2.3 and Table F2.3, noting: <ul style="list-style-type: none"> • Separate facilities typically required for males and female • Separate facilities required for staff and student in schools • Specific kitchen, laundry and bathing facilities required to be provided in Class 9a buildings • Specific facilities are required to be provided in childcare centres – including junior toilet pans & basins, kitchen facilities, laundry facilities and nappy changing benches 	<p>The existing facilities are unaffected by the proposed works. It is understood that the proposed works will not result in additional staff or patrons being accommodated. On this basis no additional facilities are required.</p> <p>It is noted that the staff facilities are proposed to be provided in the Nocturnal House, and additional facilities for patrons are proposed in the Treehouse.</p> <p>The plans indicate that the proposed facilities are 'uni-sex'- The BCA does not permit non-accessible WC's to be unisex. It is considered that a Performance Solution can be provided at CC stage to support the current design (on the assumption that full height partitions can be provided).</p>



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
		
F2.5 Construction of Sanitary Compartments	<ul style="list-style-type: none"> Sanitary compartments (except in child care centres) must have doors and partitions to provide privacy In enclosed sanitary compartments, where the distance between the closet pan and the nearest part of the doorway of an inwards swinging door is less than 1.2m, the door must be fitted with lift off hinges. 	NA – as above
F2.6 Interpretation: Urinals and washbasins	<ul style="list-style-type: none"> Urinals may be individual stalls or a length of 600mm in a trough A closet pan may be used in lieu of a urinal Washbasins may be single basins or part of a trough provided with a tap 	Informational clause.
Part F3 Room Sizes		
F3.1 Height of Rooms and other spaces	<p>The following general ceiling height requirements apply:</p> <ul style="list-style-type: none"> Habitable areas – generally 2.4m Non-habitable areas – including bathrooms, hallways, corridors, storerooms – generally 2.1m Above a stairway – 2m Additional requirements apply in Class 9 buildings. 	<p>2400mm required to habitable rooms and 2100mm to non-habitable including sanitary compartments.</p> <p><i>Detailed sections to be provided at CC stage.</i></p>



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
Part F4 Light & Ventilation		
F4.1 Provision of natural light	Natural light is required to be provided to habitable/sleeping rooms in Class 2, 3, 4 and 9 buildings	NA to subject design.
F4.2 Methods and extent of natural lighting	<p>Natural light must be provided from:</p> <ul style="list-style-type: none"> • Windows (with an aggregate light transmitting area of not less than 10% of the floor area of the area which they serve); or • Skylights with an aggregate light transmitting area of not less than 3% of the floor area of the area which they serve; or • A combination of both <p>Windows must typically be setback from the boundary/wall of the building or other building on the allotment:</p> <ul style="list-style-type: none"> • Generally at least 1m (or 3m for sleeping rooms in a Class 9a building) • 50% of the square room of the height of the wall in which the window is located. I.e. the higher the wall the greater the setback required. <p>Note in Class 9b childcare centres, at least 50% of the windows must have sill height not greater than 500mm from the floor level.</p>	As above.
F4.3 Natural light borrowed from adjoining room	<p>This clause allows natural light in Class 2-4 buildings to be borrowed from an adjoining room.</p> <p>The room providing the borrowed light must be provided with windows which have a light transmitting area of at least 10% (or skylights with an area or 3%) of the combined floor area of both rooms.</p>	Borrowed natural light is not proposed to be utilised.
F4.4 Artificial lighting	<p>Artificial lighting complying with AS1680.0 must be provided to:</p> <ul style="list-style-type: none"> • all required stairs, ramps and passageways • areas not provided with natural light (or areas that may cause a hazard when people are seeking egress) 	<i>Details to be provided at CC stage.</i>



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
F4.5 Ventilation of Rooms Note NSW F4.5	Any room occupied by a person for any purpose must be provided with either: <ul style="list-style-type: none"> natural ventilation complying with BCA F4.6 or: mechanical ventilation in accordance with AS1668.2 	<i>Details to be provided at CC stage.</i>
F4.6 Natural Ventilation	Natural ventilation must constitute 5% of the floor area of the area serving and open to a suitable outdoor, covered open area or adjacent shared room with suitable natural ventilation openings.	<i>Details to be provided at CC stage.</i>
F4.7 Ventilation borrowed from adjoining room	Natural ventilation can be borrowed from an adjoining room providing adjacent room is provided ventilating area that is 5% (or 10% in Class 5-9 buildings) of the both the subject room and the adjoining room combined.	It appears that the building will not rely on 'borrowed' natural ventilation.
F4.8 Restriction of position of water closets and urinals	Generally sanitary compartments must not open directly into: <ul style="list-style-type: none"> A kitchen, pantry, public dining area or restaurant Dormitory in a Class 3 building Room used for public assembly Workplace normally occupied by more than 1 person 	The design is considered to show general compliance.
F4.9 Airlocks	Airlocks can be used between a sanitary compartment and area described in BCA F4.8 above. In a Class 5-9 building, airlocks must have a floor area of at least 1.1m ² and be fitted with self-closing doors. Alternatively, the sanitary compartment must be provided with mechanical exhaust and the doorway suitably screened from view.	See comments in Clause 4.8 above.
F4.11 Carparks	Carparks (excluding open deck carparks) must be provided with: <ul style="list-style-type: none"> A system of mechanical ventilation in accordance with AS1668.2; or A system of natural ventilation complying with Section 4 of AS1668.4 	The mechanical ventilation system serving the Nocturnal House must comply with AS1668.2. <i>Details to be provided at CC stage.</i>
F4.12 Kitchen local exhaust	A commercial kitchen must be provided with an exhaust hood in accordance with AS1668.1 & AS1668.2	There are no commercial kitchens proposed on the current plans.



BCA DEEMED-TO-SATISFY PROVISION	SUMMARY OF REQUIREMENT	COMPLIANCE COMMENT/STATUS/RECOMMENDATION
Part F5 Sound Transmission		
F5.2 Determination of airborne sound insulation ratings	A form of construction required to achieve a sound insulation rating may achieve be determined in accordance with AS/NZS 1276.1 or ISO 717.1 or comply with Specification F5.2	NA to subject design.
F5.3 Determination of impact sound insulation ratings	Walls in the Class 2 & 3 parts, where required to have an impact sound insulation rating must be of discontinuous construction i.e. provided with a 20mm cavity between the leaves	
F5.4 Sound Insulation of floors between units	The floor separating storeys must comply with F5.4 of the BCA (Rw + Ctr (airborne) not less than 50 and Ln,w+Cl (impact) of not more than 62).	
F5.5 Sound insulation of walls between units	Walls between residential SOUs must achieve an Rw + Ctr (airborne) not less than 50 and a Rw (airborne) if it separates a SOU from a plant room, lift or stair shaft, public corridor or the like – or parts of a different Classification. Noting, discontinuous construction is also required (i.e. 20mm cavity) to separate a bathroom, sanitary compartment, laundry or kitchen in one sole-occupancy unit from a habitable room (other than a kitchen) in an adjoining unit.	
F5.6 Sound insulation rating of services	Service pipes must be sound insulated in accordance with this clause.	
F5.7 Sound isolation of pumps	Flexible couplings must be used at the point of connection between service pipes and circulating pumps.	



4.0 Conclusion

This report has assessed the Development Application (DA) level design documentation for the proposed **'Upper Australia' Exhibit and refurbishment of the existing Nocturnal House**, at **Taronga Zoo** under the provisions of the Building Code of Australia (BCA).

It is understood that this report will be submitted to Council to support the Development Application for the subject building.

The primary purpose of the report was to assess the development design and identify any significant non-compliance matters in comparison to the current deemed-to-Satisfy (DTS) provisions of the BCA. Assessment is limited to those issues ascertainable from the current level of detail.

Subject to the recommendations contained in Section 3.0 of this report, the development can readily comply with the requirements of the BCA.

Further assessment of the detailed design should also be undertaken upon determination of the Development Application, and prior to the Construction Certificate being issued.

