

Fire Safety Engineering Design Review for SSDA Submission



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221-235 Luddenham Road, Orchard Hills NSW

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NSW**
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1. General

Scientific Fire Services has undertaken a preliminary review and assessment of the architectural drawings/concepts for the development located at 221-235 Luddenham Road, Orchard Hills NSW. The existing site is legally described as Lot 1 in DP 1293805. This site shall be designated as Lot 11 of the new community subdivision plan DP271602 following completion of the site subdivision. This report responds to the SSD-69845208 Secretary's Environmental Assessment Requirement (SEARs) which was issued by the Department of Planning, Housing and Infrastructure on 15th May 2024.

2. Building Description

The site is located at 221-235 Luddenham Road, Orchard Hills within the Penrith Local Government Area (LGA). It is proposed to construct a new Storage and Distribution Warehouse within the Alspeck Industrial Business Park (AIBP). The development shall comprise of the construction of a new Class 7b warehouse with a Class 5 two (2) storey office. The subject site fronts Luddenham Road to the west which shall serve as the principal site entry for pedestrians, cars and trucks. The carpark entry/exit shall lead into the west side of the building where 246 external carparks.

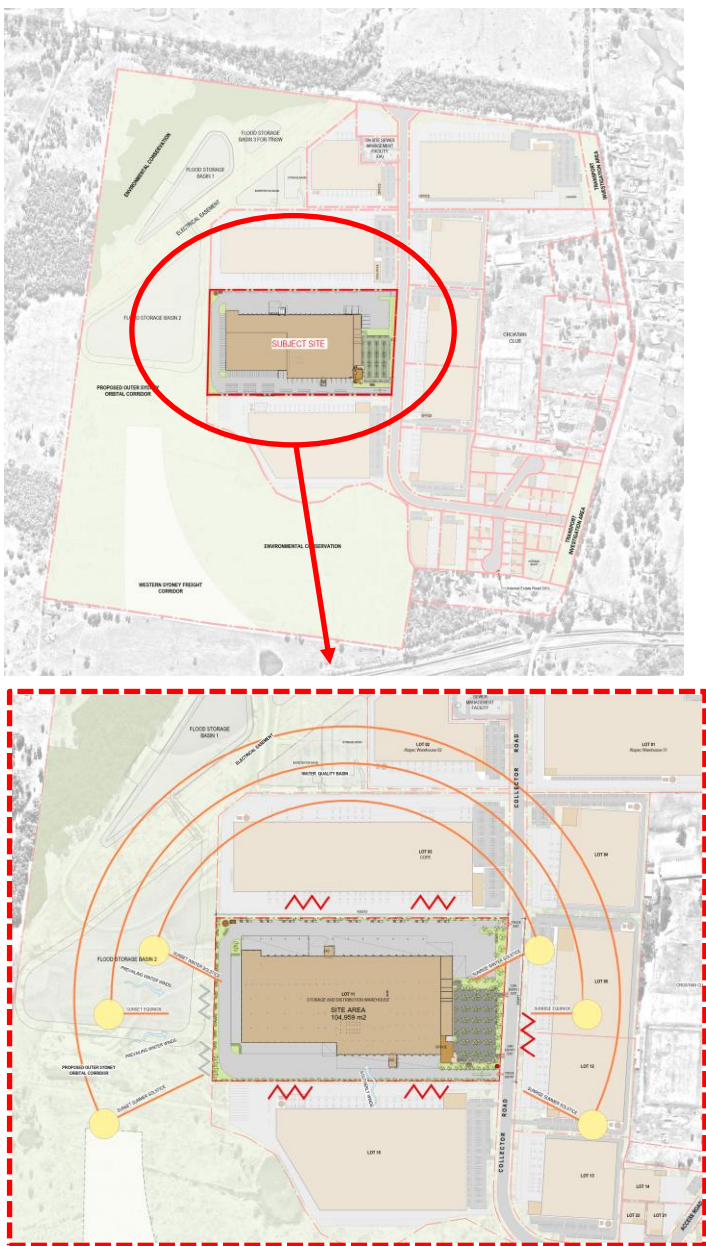


Figure 2.1: Site locality within Alspeck Industrial Business Park (AIBP)

The Class 7b warehouse shall have a ridge height of predominantly 14.7m, with the introduction of a high-bay warehouse component at the western portion of the building which achieves a maximum height of 39m. The facility shall consist of an Automatic Storage and Retrieval System (ASRS) within the high-bay warehouse area. The building shall have a total area of 45,512m² with the Class 5 office being 1,843m² and the Class 7b warehouse being 43,606m².



Figure 2.2: Site Plan

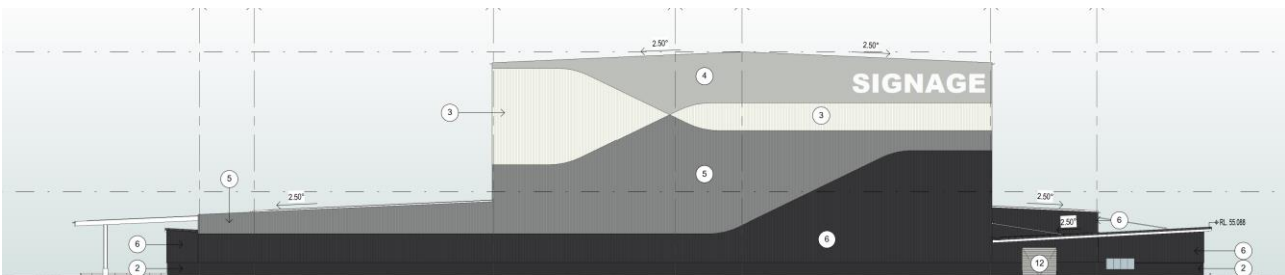


Figure 2.3: Elevations Plan

As the volume of the proposed building exceeds the maximum volume permitted in Table C3D3 of Volume One of the BCA, the building has been classified as a 'Large Isolated Building' (LIB). The building is required by Clause C2D2 of the BCA to be constructed in accordance with Type B fire-resisting construction. Furthermore, the building is required to be provided with an automatic fire sprinkler system incorporating a storage sprinkler system in accordance with Clause E1D4 of the BCA.

3. Purpose

The preliminary fire safety engineering review was undertaken to determine 'in-principle' whether the design will achieve compliance with the Performance Requirements of the Building Code of Australia (BCA) (ABCB, 2022). The design review relates to the fire-resisting construction, egress provisions and fire protection services proposed for the entire development.

The design issues specific to the development will be formally assessed through the application of the fire safety risk engineering process in accordance with the Australian Fire Engineering Guidelines (AFEG) (ABCB, 2021). It is the expectation that a suitable Performance Solution will be developed and supported through robust fire engineering methodologies in accordance with the current design proposal.

4. Compliance Expectation

4.1 General

The relevant Performance Requirements against which the Performance Solution is assessed must be established in accordance with the BCA. From Clause A2G2, a number of 'Performance Solutions' may be used to show that a Building Solution complies with the Performance Requirements. The design issues that will be the subject of the project Performance Solution has been identified by the BCA consultant in conjunction with the Principal Certifying Authority (PCA). The following table provides a summary of the fire safety risk engineering aspects of the design that will be the subject of the project Performance Solution.

Table 4.1: BCA departures – Fire safety engineering scope of works

No.	Design Issue to be Addressed	BCA DtS Provision	Performance Requirement
1.	<p>Entire Site:</p> <p>Due to the rise in storeys being three (3) storeys the building is required to be constructed in accordance with Type B construction. In this instance, it is proposed to permit Type C fire resisting construction in lieu of Type B fire resisting construction.</p>	<p>Clause C2D2, Clause C2D10, Clause C2D14 inter alia Specification 5</p>	C1P1 & C1P2
2.	<p>Entire Site:</p> <p>The following design issues have been identified with respect to the proposed perimeter vehicular access serving the building:</p> <ul style="list-style-type: none"> • To permit to perimeter vehicular access to be located more than 18m away from the external wall of the building; and <ul style="list-style-type: none"> – Western elevation to the high bay warehouse up to 23m when inclusive of the 6m perimeter path. – Southern elevation to the high bay warehouse up to 23m when inclusive of the 6m perimeter path. – Northern elevation to the high bay warehouse up to 36m when inclusive of the 6m perimeter path. – Eastern elevation to the Keg Palletising Area up to 72m when inclusive of the 6m perimeter path. • To permit the main entry gate to be fitted with swipe card readers and provided to responding fire stations and/or auto open upon GFA; and <ul style="list-style-type: none"> – Chain wire gates along PVA road to be fitted with L003 key locks or alternatively, FRNSW to receive tenant keys; – Main entry sliding gates to be fitted with swipe card readers (provided to FRNSW stations). 	<p>Clause C3D4 & C3D5(2)</p>	C1P9
3.	<p>Warehouse Portion:</p> <p>It has been identified that the exit travel distance to a point of choice within the <u>warehouse portion</u> exceeds the maximum prescribed exit travel distances. More specifically:</p> <ul style="list-style-type: none"> • The exit travel distance is greater than 20m to a point of choice (i.e. 30m); and • The exit travel distance is greater than 40m to an exit (i.e. 100m); and • The distance between alternative exits is greater than 60m (i.e. 200m). 	<p>Clause D2D5 Clause D2D6</p>	D1P4 & E2P2
4.	<p>Office Portion:</p> <p>It has been identified that the exit travel distance to a point of choice within the <u>office portion</u> exceeds the maximum prescribed exit travel distances. More specifically:</p> <ul style="list-style-type: none"> • The exit travel distance is greater than 40m to an exit (i.e.: up to 45m) within Level 1. 	<p>Clause D2D5</p>	D1P4 & E2P2
5.	<p>Warehouse Portion:</p> <p>Review the zones throughout the mechanical plant contain areas in which the required path for maintenance personnel only to provided with egress widths of 600mm in lieu of 1000mm.</p>	<p>Clause D2D8 & Clause D2D10</p>	D1P4, D1P6 & E2P2

No.	Design Issue to be Addressed	BCA DtS Provision	Performance Requirement
6.	<p>Warehouse Portion:</p> <p>The following departures affiliated with the use of the non-fire isolated stairs are to be addressed through means of a performance basis:</p> <ul style="list-style-type: none"> • A travel distance where a point of choice is available at the bottom of the non-fire isolated exit exceeds 40m to reach the road/open space; and • An overall travel distance from the mezzanine levels exceeds 80m to reach the road/open space; and • A discontinuous means of travel is applicable via each the non-fire isolated stairs serving the mezzanine where occupants need to traverse to an additional non-fire isolated exit in lieu of directly discharging to a road or open space. 	Clause D2D14	D1P4, D1P5 & E2P2
7.	<p>Entire Site:</p> <p>The fire hydrant system is proposed to be designed & installed in accordance with AS2419.1:2021; and</p> <ul style="list-style-type: none"> • As the Class 7b building exceeds a total volume of 108,000m³, the fire hydrant system is proposed to be designed based on a performance approach and accordingly to facilitate the operational requirements of the attending fire brigade; and • Permit fire hydrant shortfalls within the warehouse. In this instance, three (3) lengths of fire hose may be required from external fire hydrants in order to achieve complete fire hydrant coverage; and • Permit the fire appliances to be within 10m from the external wall/awnings/canopies; and • Permit the fire hydrant booster assembly to not being within direct line of sight of the main entry; and • Permit the fire hydrants located under the sprinkler protected super awnings to be treated as external hydrants; and • Permit the use of internal fire hydrants which are additional to the initial attack which are not permitted under AS2419.1-2021. Clause 3.6.3 of AS2419.1-2021 only provides a concession for Class 2, 3 & part 4 buildings. 	Clause E1D2 inter alia AS2419.1:2021	E1P3
8.	<p>Warehouse Portion:</p> <p>The fire hose reel system shall be designed and installed in accordance with AS2441.1:2005 with the exception of the following:</p> <ul style="list-style-type: none"> • It is proposed to permit 50m fire hose reels in lieu of 36m fire hose reels at the warehouse portions only. 	Clause E1D3 inter alia AS2441:2005	E1P1
9.	<p>Office Portion:</p> <p>The fire hose reel system shall be designed and installed in accordance with AS2441.1:2005 with the exception of the following:</p> <ul style="list-style-type: none"> • It is proposed to omit the fire hose reels from the office portion of the building only 	Clause E1D3 inter alia AS2441:2005	E1P1
10.	<p>Office Portion:</p> <p>It is proposed to omit the requirement for sprinkler protection to the Comms Room. In this instance, it is proposed to provide fire separation achieving a minimum FRL of 120 minutes and furthermore provide point type smoke detection within the Comms Room.</p>	Clause C3D4(a) Clause E1D4 (Specification 17C3) inter alia AS2118.1:2017 (Clause 3.1.1)	E1P4
11.	<p>Entire Site:</p> <p>It is proposed to permit the sprinkler booster assembly to be located adjacent to the sprinkler tank facing the emergency vehicular access road; and</p> <ul style="list-style-type: none"> • Not being within direct line of sight of the main entry contrary to Clause 7.3(d)(i) from AS2419.1:2021; and • Not be adjacent to the principal vehicular entry contrary to Clause 7.3(d)(i) from AS2419.1:2021; and • Not be located at the site boundary; and • Booster assembly being located within 1.5 times the building height. 	Clause E1D4 inter alia AS2118.1:2017	E1P4

No.	Design Issue to be Addressed	BCA DtS Provision	Performance Requirement
12.	<p>Warehouse Portion Only:</p> <p>The sprinkler system shall be designed and installed in accordance with AS2118.1:2017 with the exception of the following:</p> <ul style="list-style-type: none"> The storage sprinklers within the warehouse portion shall be permitted to comply with FMDS 8-9, Table 17(b) in lieu of AS2118.1:2017. FMDS 8-9 is to be adopted to allow flexibility in the building design (i.e.: ridge height); and The ASRS system within the warehouse portion shall be permitted to comply with FMDS 8-34 in lieu of AS2118.1:2017. FMDS 8-34 is to be adopted as a suitable protection for Automatic Storage and Retrieval System storage. 	Clause E1D4 inter alia AS2118.1:2017	E1P4
13.	<p>Entire Site:</p> <p>It is proposed to provide an automatic smoke exhaust system in accordance with Clause E2D10, Specification 21 from BCA 2022 and AS1668.1:2015 except for the following:</p> <ul style="list-style-type: none"> It is proposed to rationalise the smoke exhaust capacity of the automatic smoke exhaust capacity serving the Class 7b warehouse portions of the building; and It is proposed to omit the requirement for smoke baffles throughout the building; and It is proposed to omit the smoke detection provisions throughout which would otherwise form part of an automatic smoke exhaust system; and It is proposed to omit the requirement for the automatic smoke exhaust system throughout all other Class 5 parts of the building. 	Clause E2D10	E2P2
14.	<p>Warehouse Portion Only:</p> <p>Exit signs and directional exit signs are to be installed throughout the warehouse tenancy in accordance with Clauses E4D6 and E4D8 from Volume One of the BCA and AS2293.1:2018 with the exception of the intermediate mounting heights of exit signage within the warehouse portion of the building. The directional and non-directional exit signs are to be "JUMBO" signs and furthermore, shall be mounted between 3.6m to 5.5m above the finished floor level (measured to the top of the exit signage) within the ground floor warehouse portion only in lieu of 2.7m as required by the prescriptive provisions from Volume One of the BCA. Exact number would be determined in the FSER stage; and</p> <ul style="list-style-type: none"> Exit signage serving the office must be at height which complies with the DtS provisions of the BCA; and Exit signage above the PA doors (within the office and the warehouse) must be at height which complies with the DtS provisions of the BCA. <p><i>*Note: The increase in exit signage of the intermediate mounting heights is only limited to the ground floor only and not to any potential levels of the Autostore or High Bay area.</i></p>	Clause E4D6 & E4D8 inter alia AS2293.1:2018	E4P2

The abovementioned design issues shall be addressed through a combination of qualitative & quantitative assessment methodologies. The methodologies will rely upon a combination of enhanced passive and active fire safety measures specific to each design issue which is to be rationalised through a holistic approach.

4.2 FRNSW Consultation

Scientific Fire Services can confirm that the approvals process through Fire & Rescue NSW (FRNSW) will be followed in regard to the Performance Solution submission of this project which have been categorised as "State Significance". FRNSW has confirmed that they look forward to reviewing the design once the design has been further development and will likely support a meeting during the FRNSW consultative stage and Fire Engineering Brief Questionnaire (FEBQ) stage. The role of the Authority Having Jurisdiction (FRNSW) is clearly understood and Scientific Fire Services confirm that the fire engineering consultation and design shall comply with Fire & Rescue NSW Fire Safety Guidelines and Position Statements and all other relevant requirements.as provided within <https://www.fire.nsw.gov.au/page.php?id=9145>.

5. Statement of Endorsement

The fire and life safety related design issues will be addressed through the performance-based path of compliance. Scientific Fire Services can confirm that the proposed design will achieve fire safety design compliance to the Performance Requirements of Volume 1 of the Building Code of Australia (BCA)(ABCB, 2022).

The formulation of the Performance Based Design Brief (PBDB) represents the next step in the approvals process. Scientific Fire Services shall commence the process of developing this document and will provide a formal comprehensive PBDB submission. As part of the process, a Fire Engineering Brief Questionnaire (FEBQ) document shall be prepared in accordance with the Fire and Rescue NSW pro forma and formally submitted as part of the referrals process.

Finally, and in order to ensure that the client can obtain a Construction Certificate for the proposed building works, Scientific Fire Services will prepare a Fire Safety Engineering Report (FSER) incorporating stakeholder conditions, comments and advice to the satisfaction of the Principle Certifying Authority (PCA).

On the basis of the review of the proposed design issues identified herein, Scientific Fire Services can confirm that the design of the building will achieve fire safety design compliance to the relevant Performance Requirements of the National Construction Code Series – Volume 1, Building Code of Australia (BCA), 2022.

I trust the above is satisfactory for your current purposes. Should you have any queries, please do not hesitate to contact me on (02) 9221 3658 or parkan.behayeddin@scifire.com.au



Parkan Behayeddin

Scientific Fire Services

BDC: 0756 - Certifier – Fire Safety

Appendix A. Architectural Drawings

Drawing Number	Drawing Name	Revision	Date
DA001	MASTER PLAN	P4	23/05/25
DA002	SITE CONTEXT	P2	10/03/25
DA003	SITE ANALYSIS	P3	23/05/25
DA010	GENERAL ARRANGEMENT PLAN - WAREHOUSE	P5	23/05/25
DA011	GENERAL ARRANGEMENT PLAN - MEZZANINE	P5	23/05/25
DA015	GENERAL ARRANGEMENT PLAN - ROOF	P5	23/05/25
DA016	OFFICE LAYOUTS	P3	23/05/25
DA017	DOCK OFFICE LAYOUT	P3	23/05/25
DA021	ELEVATIONS	P4	23/05/25
DA025	OFFICE ELEVATIONS	P3	23/05/25
DA031	BUILDING SECTIONS	P4	23/05/25