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128 ANDREWS ROAD, PENRITH NSW 2750

Schematic Design BCA Report

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Our Ref: 180123 SD Report 151018 NS

15 October 2018

Texco Construction Pty Ltd
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Attention: Kithsiri Amarakoon

Dear Kithsiri,

128 ANDREWS ROAD, PENRITH NSW 2750
PROPOSED INDUSTRIAL LOGISTICS FACILITY (OWENS-ILLINOIS)

SCHEMATIC DESIGN REVIEW PURSUANT TO THE BUILDING CODE OF AUSTRALIA 2016 (BCA)

Having reviewed the preliminary architectural and fire service plans associated with the above mentioned development, we provide the following schematic design BCA report for the information and action of relevant design consultants.

Please don't hesitate to contact the undersigned should you require further clarification or discussion with regard to any of the matters contained herein.

Yours faithfully,
SINGH CONSULTING PTY LTD

Narinder Singh BE RBP MAIBS
Managing Director

128 ANDREWS ROAD, PENRITH NSW 2750
PROPOSED INDUSTRIAL LOGISTICS FACILITY (OWENS-ILLINOIS)

SCHEMATIC DESIGN REVIEW PURSUANT TO THE BUILDING CODE OF AUSTRALIA 2016 (BCA)

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
General	The overall project comprises construction of a new industrial development located at the above mentioned address. The proposed development has been assessed against regulatory provisions contained in the Building Code of Australia 2016 Amendment 1 (BCA).	Note.	
R139 – Applications for construction certificates	A construction certificate application form is required for each and every stage of works requiring a construction certificate. Each application is to include the information and be accompanied by the documentation noted in Part 3 of Schedule 1 of the EP&A Regulation 2000.	Note.	
R140 – Additional information	A certifying authority may require an applicant of a construction certificate to give the certifying authority any additional information concerning the proposed building work that is essential to the certifying authority's proper consideration of the application. This may include certificates of compliance (referenced in Part 3 of Schedule 1 of the EP&A Regulation 2000) issued by suitably qualified building practitioners to certify that a design of building work complies with the EP&A Act 1979, EP&A Regulation 2000 & BCA 2016.	We envisage the structural design shall be independently certified. Other design documentation may also be certified for design compliance if desired.	
R144 & R152 – Fire safety report of Fire Commissioner	Referral to the Fire Commissioner of the relevant fire brigade (FRNSW) will be required for any alternative solution to meet the performance requirements contained in any one or more of the Category 2 fire safety	Discussions and referrals to FRNSW shall take place in due course.	Referral to the Fire Commissioner of the FRNSW is anticipated and shall be applied for in due course.

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	provisions. Namely, the following provisions in Volume 1 of the BCA: - CP9 (perimeter vehicle access & fire brigade intervention); - EP1.3 (fire hydrant systems); - EP1.4 (sprinkler systems); - EP1.6 (facilities for fire brigade intervention); - EP2.2 (evacuation route tenability); and - EP3.2 (emergency lifts). A final fire safety report must be issued by the Fire Commissioner at the completion of works.		
R144A – Alternative solution report	A certifying authority must not issue a construction certificate for building work that involves an alternative solution under the BCA in respect of a fire safety requirement unless the certifying authority has been issued with an alternative solution report that complies with this Regulation.	Note.	
D4.2 & R146 – Development Approval	A development approval and endorsed plans are required to be in place prior to any construction certificate/s being issued. All relevant conditions noted in the development approval will need to be satisfied as required. All design documentation issued for construction certificate approval is to be consistent with development approval documentation.	Note.	
D6.3 & R147– Construction certificate/s	A construction certificate is required for each and every stage of works requiring a construction certificate.	Note.	
R149 – Application for occupation certificate/s	An occupation certificate application form is required prior to any part of the site being occupied or used for its intended purpose. The application is to include the information and be accompanied by	Note.	

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
	the documentation noted in Clause 149 of the EP&A Regulation 2000.		
D6.3 & R155 – Occupation certificate/s	An occupation certificate is required prior to any part of the site being occupied or used for its intended purpose.	Note.	
R162A – Critical stage inspections	For the purposes of section 109E (3) (d) of the EP&A Act, the following critical stage inspections are considered required for the proposed development: - After excavation for, and prior to the placement of, any footings; - Prior to pouring any in-situ reinforced concrete building element; - Prior to covering of the framework for any floor, wall, roof or other building element, - Prior to covering waterproofing in any wet areas; - Prior to covering any stormwater drainage connections; and - After the building work has been completed and prior to any occupation certificate being issued in relation to the building.	Note.	
Build over easement report and consent	Report and consent of relevant service authorities will be required to construct a building over an easement vested in that authority. Relevant service authorities include: - A council; - A drainage authority; - The relevant electricity supply authority; - The relevant gas supply authority; - A sewerage authority; and - A water supply authority.	The plan of subdivision indicates several easements occur on the site and are within the proposed works area. As such, build over easement consents of relevant service authorities will be required.	

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Electricity supply authority report and consent	Report and consent of the relevant electricity supply authority will be required for any sub-station required on the site to service the proposed building/s.	Report and consent of the relevant electricity supply authority is to be obtained to confirm if an electricity sub-station or upgrade to existing electricity supply is required. Alternatively, a letter of offer for power supply to the site will suffice.	
Protection of the public	Precautions are required to be taken before and during building work to protect the safety of the public. If any protection measures extend over the street alignment, report and consent of the relevant Council is to be obtained.	Precautionary measures to be implemented for the protection of the public are to be nominated and submitted to our office for review and approval. If any protection measures extend over the street alignment, report and consent will be required from Penrith City Council.	
Stormwater drainage	The report of the relevant Council is to be obtained indicating the location of the approved point of stormwater discharge.	The stormwater drainage system is to be designed and connected to the approved point of discharge as nominated by Penrith City Council.	
A3.2 – Classifications	Class 5 – Office Class 7a – Carpark Class 7b – Warehouse (Primary use)	Note.	

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
Part B1 – Structural provisions	The structure is to be designed to cater for relevant loads and actions determined in accordance with BCA Part B1 and AS1170 Parts 0, 1, 2, 3 and 4.	It is anticipated that design documentation will be coordinated to comply with these requirements. The structural engineer will be required to verify this in his/her design certificate.	
C1.1 – Type of construction required	Given the building has a rise in storeys of 1, Type "C" fire resistant construction is required. Since all walls and structural elements of the buildings are positioned greater than 3m from adjoining allotment boundaries, Nil Fire Resistance Level (FRL) is required to structural elements (other than shield walls to fire hydrants).	A non-fire rated concrete structure and/or steel portal frame would be able to achieve these requirements.	
C1.2 – Calculation of rise in storeys	Number of levels = 1 Rise in storeys = 1 Effective Height = N/A	Note.	
C1.10 – Fire hazard properties	The fire hazard properties of materials, linings and assemblies in the building must comply with the relevant provisions contained in BCA Specification C1.10.	It is expected that design documentation will be coordinated to comply with these requirements.	
C2.2 – General floor area and volume limitations	The maximum size of a fire compartment in a Class 7 building of Type "C" construction must not exceed 2,000m² or 12,000m³. Our calculations indicate floor areas and volumes occur as follows: Floor area ~61,000m² Volume ~700,000m³ Note: The above figures include the canopies/awnings.	We've considered the building as a large isolated building of Type "C" fire resistant construction as noted in C2.3.	
C2.3 – Large isolated buildings	The size of a fire compartment in a Class 5 and 7 building may exceed the limits specified in C2.2 above where the building exceeds	We understand the building shall be provided with ESFR	Fire safety report pursuant to Reg. 144 & Reg. 152 is anticipated and shall

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	18,000m² or 108,000m³ and is provided with: - A sprinkler system throughout to BCA Specification E1.5; and - Perimeter vehicle access not less than 6m wide around the entire building.	sprinkler protection throughout. 6m wide perimeter vehicle access is also proposed around the building however parts of it occur greater than 18m from the building and parts are less than 6m wide which will require FRNSW approval.	be applied for in due course.
C2.7 – Separation by fire walls	An FRL of 1.5-hours (90/90/90) is to be provided to all fire walls that separate sprinklered areas from non-sprinklered areas or to separate the buildings into separate fire compartments.	In a fully sprinklered scenario, fire walls are not required since the building can be treated as a single fire compartment as per C2.2 / C2.3 above.	
C2.12 – Separation of equipment	The following equipment (if located within the building) is to be separated by construction having an FRL not less than 2-hours (120/120/120 FRL): - Lift motors and lift control panels; - Emergency generators; - Central smoke control plant; - Boilers; and - Batteries greater than 24 volts and a capacity greater than 10 ampere hours.	It is not envisaged that any of this equipment is to be located within the building. We require further details on the forklift battery charge area to confirm if any fire ratings are required to this area.	
C2.13 – Electricity supply system	The following equipment (if located within the building) is to be separated by construction having an FRL not less than 2-hours (120/120/120 FRL): - Electricity sub-stations; - Main switchboards; and - Electrical conductors that supply a sub-station or main switchboard.	It is not envisaged that any of this equipment is to be located within the building.	

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
C3.5 – Doorways in fire walls	If fire walls are incorporated into the buildings, any doorway openings in the fire walls would need to be self-closing or automatic-closing and require an FRL not less than 1.5-hours (-/90/30 FRL).	We understand the building shall not be provided with internal fire walls. As such, no specific requirements apply for fire doors.	
D1.4 – Exit travel distances	Travel distances in a Class 5 office and Class 7 warehouse building must not exceed 20m to a point from which travel in different directions to exits is available and the maximum distance to one of those exits must not exceed 40m from the starting point.	It is anticipated that extended travel distances to an exit up to ~75m shall occur.	A Performance Building Solution (PBS) prepared by a fire safety engineer will be required to justify the extended travel distances.
D1.5 – Distance between alternative exits	Distances between required alternative exits must not be greater than 60m apart in all cases.	It is anticipated that extended travel distances between exits up to ~150m shall occur.	A Performance Building Solution (PBS) prepared by a fire safety engineer will be required to justify the extended travel distances.
D1.6 Dimensions of exits and paths of travel to exits	In a required exit or path of travel to an exit, the following requirements apply: - An unobstructed height of 2m is required (except at doorways where it may be reduced to 1980mm); and - An unobstructed width of 1m is required throughout.	Compliance apparent.	
D1.10 – Discharge from exits	An exit must not be blocked at the point of discharge and where necessary, suitable barriers must be provided to prevent vehicles from blocking the exit, or access to it. If an exit discharges to open space that is at a different level than the public road to which it is connected, the path of travel to the road must be by: - By a ramp having a gradient not steeper than 1 in 8 at any part; or - By a ramp having a gradient not steeper than 1 in 14 if required by Part D3 of the BCA.	Bollards positioned externally are required adjacent to each exit door.	

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
	If a required leads to an open space, the path of travel to the road must have an unobstructed width throughout not less than the minimum width of the required exit or 1m, whichever is the greater.		
D2.7 Installations in exits and paths of travel to exits	Services or equipment such as electricity meters / distribution boards or ducts / central telecommunications distribution boards / electrical motors or other motors serving equipment may be installed in non-fire isolated exits or a corridor, hallway, or the like leading to an exit where the service or equipment is enclosed by non-combustible construction with doorways and openings sealed by smoke seals.	It is expected that design documentation will be coordinated to comply with these requirements.	
D2.15 – Thresholds	Doorway thresholds must not incorporate a step or ramp within a distance of at least the width of the door leaf, unless: - The doorway opens to a road or open space, external stair landing or external balcony; and - The door sill is not more than 190mm above the finished ground or floor surface to which the doorway opens.	It is expected that design documentation will be coordinated to comply with these requirements.	

D2.16 – Balustrades or other barriers	A continuous balustrade or other barrier must be provided along the side of any roof to which public access is provided, any stairway or ramp, any floor, corridor, hallway, balcony, deck, verandah, mezzanine, access bridge or the like and along the side any delineated path of access to a building, if:
	- it is not bounded by a wall; and
	- Its level above the surface beneath, is more than:
	  - 4m where it is possible for a person to fall through an openable window; or
	  - 1m in any other case.
		It is expected that design documentation will be coordinated to comply with these requirements.	

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
	Where required, balustrades shall be provided in accordance with BCA Clause D2.16.		
D2.17 – Handrails	Handrails are required to each side of ramps provided for access by persons with disabilities.	It is expected that design documentation will be coordinated to comply with these requirements.	
D2.18 – Fixed platforms, walkways, stairways and ladders	Machinery rooms, lift-machine rooms, plant rooms, and the like may be provided with fixed platforms, walkways, stairways, ladders complying with AS1657.	It is expected that design documentation will be coordinated to comply with these requirements.	
D2.20 – Swinging doors	Exit doors are required to swing in the direction of egress.	Compliance apparent.	

D2.21 – Operation of latch	All doors must be openable without a key from the side that faces a person seeking egress, by a single hand downward or pushing action on a single device located between 900mm and 1100mm above the floor, except if it:
	- Serves a mental health facility or the like and it can be immediately unlocked:
	  - By operating a fail-safe control switch to unlock the door; or
	  - By hand by a properly trained nominated person/s available at all times; or
	- Is fitted with a fail-safe device which automatically unlocks the doors upon activation of a smoke or any other detector deemed suitable in accordance with *AS1670.1* installed throughout the building.
		It is expected that design documentation will be coordinated to comply with these requirements.	

Part D3 – Access for people with a disability	Access for persons with disabilities is required to and within all areas of the building in accordance with the BCA 2016 and AS1428.1-2009 requirements. Furthermore:	Compliance generally apparent however we'll need fully dimensioned working drawings with finished ground / surface	A Performance Building Solution (PBS) prepared by an accredited disability access consultant will be required to justify the non-provision of wheelchair access

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
	- The lift car requires the following minimum dimensions: 1100mm wide x 1400mm deep and 900mm clear doorway opening; - All passageways and corridors to be minimum 1240mm wide; and - All doorways require a clear opening width not less than 850mm (we recommend using 920mm doors), 110mm hinge side clearance and 530mm latch side clearance.	levels to confirm compliance.	from the footpath to the office entry.
Part D3.5 – Carparking	Carparking complying with AS/NZS 2890.6-2009 must be provided in the following ratios: - 1 space for every 100 carparking spaces or part thereof.	A car space and adjoining shared space is currently shown adjacent the main office entry. We'll require finished ground / surface levels from this car space to the main office entry to confirm a compliant accessibly path of travel is achieved.	
D3.6 – Identification of accessible facilities, services and features	Braille and tactile signage complying with BCA Specification D3.6 and AS1428.1-2009 is required.	It is expected that design documentation will be coordinated to comply with these requirements.	
D3.8 – Tactile indicators	Tactile ground surface indicators complying with AS1428.4.1 must be provided to warn visually impaired persons they are approaching: - A public stairway; and In the absence of a suitable barrier: - An overhead obstruction less than 2m above the floor; and - A path of travel meeting a vehicular way adjacent to a principal entrance to a building if there is no kerb or kerb ramp at that point.	It is expected that design documentation will be coordinated to comply with these requirements.	

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
E1.3 – Fire hydrants	For buildings greater than 500m² in floor area, a fire hydrant system is required to provide coverage to all parts of the building. The system is to be designed and installed in accordance with AS2419.1.	Discussions and referrals to FRNSW shall take place in due course. At this stage, the following performance solutions are anticipated: - Perimeter vehicle access road greater than 18m from the building; - Perimeter vehicle access road less than 18m from the building; - Extra length of hydrant hose to external hydrants to achieve full coverage; - Fire hydrants under sprinkler protected canopies/awnings to be considered as external attack hydrants (3 x 30m lengths of hose) - Deletion of fire hydrant shield walls; - Fire hydrant booster assembly at the Southern end of entry road in lieu of the main entry of the site; - Fire trucks accessing feed hydrants would be less than 10m from the building - Chain wire gates along PVA road to be fitted with L003 key locks;	Fire safety report pursuant to Reg. 144 & Reg. 152 is anticipated and shall be applied for in due course.

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
		- Main entry sliding gates to be fitted with swipe card readers for FRNSW and/or auto unlock on GFA; and - Mag-flow meter in the fire hydrant system.	
E1.4 – Fire hose reels	A fire hose reel system is required to provide coverage to all parts of the building. The system is to be designed and installed in accordance with AS2441.	Discussions and referrals to FRNSW shall take place in due course. At this stage, the following performance solutions are anticipated: - Fire hose reels within 4m of exit doors in lieu of the outer edges of the canopies (being the open to sky exit points).	Fire safety report pursuant to Reg. 144 & Reg. 152 is anticipated and shall be applied for in due course.
E1.5 – Sprinklers	A sprinkler system is required to provide full coverage to all parts of the building. The system is to be designed and installed in accordance with BCA Specification E1.5 and AS 2118.1.	Discussions and referrals to FRNSW shall take place in due course. At this stage, the following performance solutions are anticipated: - Sprinkler tank, pump house and sprinkler booster assembly at the rear of the site in lieu of the main entry of the site;	Fire safety report pursuant to Reg. 144 & Reg. 152 is anticipated and shall be applied for in due course.
E1.6 – Portable fire extinguishers	Portable fire extinguishers are required and they must be selected, located and distributed in accordance with AS2444.	It is expected that design documentation will be coordinated to comply with these requirements.	

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
E4.2 – Emergency lighting requirements	An emergency lighting system must be installed in accordance with E4.2 and AS2293.1 throughout the building.	It is expected that design documentation will be coordinated to comply with these requirements.	
F1.1 – Stormwater drainage	Stormwater drainage must be installed in accordance with AS3500.3.	It is expected that design documentation will be coordinated to comply with these requirements for the new building.	
F1.7 – Waterproofing of wet areas in buildings	Wet areas must be waterproof or water resistant in accordance with AS3740.	It is expected that design documentation will be coordinated to comply with these requirements.	
F2.3 – Facilities in Class 3 to 9 buildings	Sanitary facilities for male and female staff must be provided in accordance with BCA Table F2.3.	We'll need an estimate of anticipated occupant numbers and also anticipated male:female ratios to confirm compliance. Alternatively, we can use BCA specified occupant numbers.	
F2.4 – Facilities for persons with disabilities	Sanitary facilities for male and female staff with disabilities must be provided in accordance with BCA Table F2.4.	Compliance generally apparent however we'll need fully dimensioned working drawings with finished ground / surface levels to confirm compliance.	
F3.1 – Heights of rooms and other spaces	Ceiling heights of rooms and other spaces in a factory building are to be as follows: - In general office areas, passageways, corridors or the like – 2.4m; and - In ancillary and carpark areas (other than over a car space for persons with disabilities) – 2.1m;	Compliance apparent.	

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
	- Over a car space for persons with disabilities – 2.5m; and - In a stairway, ramp, landing or the like – 2.0m.		
F4.4 – Artificial lighting	An artificial lighting system is required throughout all zones in accordance with AS/NZS1680.0.	It is expected that design documentation will be coordinated to comply with these requirements.	
F4.5 – Ventilation of rooms	A mechanical ventilation system or air-conditioning system is required in accordance with AS1668.2 to serve all rooms not provided with natural ventilation complying with BCA Clause F4.6.	It is expected that the office will be provided with a mechanical ventilation system.	
F4.6 – Natural ventilation	Natural ventilation is required to all habitable rooms not provided with a mechanical ventilation system or air-conditioning system in accordance with AS1668.2 and the clear opening area is to be at least 5% of the floor area of the room the opening serves.	Natural ventilation openings to the warehouse presently comprise less than 5% of the warehouse floor area (~0.70%).	A Performance Building Solution (PBS) will be required to justify a variation in natural ventilation requirements. Anticipated occupant numbers will also need to be confirmed.
BCA SECTION J – ENERGY EFFICIENCY	Energy efficiency provisions apply to areas that are used as a "conditioned space" as defined in the BCA and compliance with these provisions must be verified by an accredited energy efficiency consultant for the following BCA Parts: - Part J1 - Building fabric; - Part J2 – Glazing; - Part J3 – Building sealing; - Part J5 – Air-conditioning and ventilation systems; - Part J6 – Artificial lighting and power; and - Part J8 – Facilities for energy monitoring. Conditioned space means a space in a building where the environment is likely, by the intended use of the	We envisage that energy efficiency requirements would only apply to the office areas of the building. The services engineer should verify if these zones are defined as a conditioned space. Lighting loads within the warehouse are also to be confirmed. If required, it is expected that design documentation will be coordinated to comply with these requirements. A report prepared a person accredited in the use of energy	A Performance Building Solution (PBS) prepared by an energy efficiency consultant will be required to justify any areas of non-compliance.

Regulatory Reference	Requirement	Comments	Performance Building Solutions/Fire Engineering
	space, to be controlled by air-conditioning, but does not include a space in a Class 7 building where the input power to an air-conditioning system is not more than 15W/m² or 15J/s.m² (54KJ/hour.m²).	rating software confirming compliance with these provisions would suffice.	

End document.