APPENDIX 15

BUILDING CODE OF AUSTRALIA COMPLIANCE REPORT

REF: 062989-03BCA

BUILDING CODE OF AUSTRALIA REPORT

Proposed Mainfreight Facility Distribution Centre Expansion
26 Yarrawa Street, Prestons

Dated: **25 February 2013**

Prepared for: **Goodman**

Prepared by: **McKenzie Group Consulting (NSW) Pty Ltd**
ACN 093 211 995

MANAGING COMPLIANCE

Level 6 / 189 Kent Street Sydney New South Wales 2000
Telephone 02 8298 6800 Facsimile 02 8298 6899 email@mckenzie-group.com.au
www.mckenzie-group.com.au

Offices in Melbourne and Brisbane

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Date	Revision Number	No. of pages	Issue or Description of Amendment	Checked By	Approved By	Date Approved
7.12.12	A	12	Draft for discussion	Heath McNab	Brigitte Thearle	7.12.12
8.02.13	B	13	DA Submission	Heath McNab	Brigitte Thearle	8.02.13
25.02.13	C	13	DA Submission	Heath McNab	Brigitte Thearle	25.02.13

Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Design+ (refer appendix A) for compliance with the Building Code of Australia 2012.

The assessment of the design documentation has revealed that the following areas are required to be assessed against the relevant performance requirements of the BCA. The submission for Construction Certificate will need to include verification from a suitably accredited fire engineer: -

DTS Clause	Description of Non-Compliance	Performance Requirement
C1.1 and Spec C1.1	Reduction of FRL's for internal load bearing elements, required to achieve an FRL of 240minutes.	CP1
C2.3 and C2.4	Perimeter Access to the facility will be required to be assessed as part of the Fire Engineered Solution as the access around / through the carpark is required to maintain a continuous path within 18m of the building. The truck breezeway will prevent strict compliance with *unobstructed height* requirements. And there exists an existing non-compliance to the north of the existing building which will be further exacerbated by the extension to the loading dock.	CP9
D1.4	Extended distances of travel to exits will be required. This will be required to be addressed as part of the fire engineered solution as follows: Travel distance to a point of choice: Up to 30m in lieu of 20m Travel distance to an exit where two or more are available: Up to 100m in lieu of 40m	DP4, EP2.2
D1.5	Extended distance between alternative exits appears required. This too shall be addressed as part of the fire engineered solution as follows: Travel distance between alternate exits: Up to 105m in lieu of 60m	DP4, EP2.2
E1.3	Hydrants located under awnings are proposed to be considered as external hydrants in lieu of being considered as internal hydrants as outlined in Australian Standard AS 2419.1-2005.	EP1.3
E1.4	Fire hose reels may be located internally and not adjacent to an internal fire hydrant or located within 4m of an exit. These hose reels will be required to achieve coverage.	EP1.1
E2.2	Rationalisation of smoke hazard management, including use of both natural and mechanical exhaust and manual smoke clearance.	EP2.2
E4.5	Illuminated exit signs within the warehouse will likely be mounted greater than 2.7m from the FFL. This is to be addressed in accordance with Performance Requirement EP4.2 of the BCA.	EP4.2

The fire engineered solution relating to Perimeter Access (CP9), Fire Hydrants (EP1.3) and Smoke Hazard Management (EP2.2) will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

The documentation will need further detailing such as door hardware, specifications, service design, as outlined in Appendix D of this report.

The application for Construction Certificate shall be assessed under the relevant provisions of the Environmental Planning & Assessment Act 1979 (As Amended) and the Environmental Planning & Assessment Regulation 2000.

Assessed By

Heath McNab
Senior Building Surveyor
McKenzie Group Consulting (NSW) Pty Ltd

1.0 Introduction

The site of the proposed Mainfreight Distribution Facility Expansion contains an existing facility with associated carpark and office facilities. There are two principal buildings located to the north and south of the lot with a breezeway located between. The two buildings connected by the breezeway have been considered as one large isolated building.

The existing building located to the north of the site, known as building 1, is proposed to have an extension accommodating a loading dock for up to seven trucks, attached to its eastern elevation.

Building 2 located to the south of the site, is proposed is be increased by 14,285m^2 via an extension to its eastern elevation. Within this portion of the facility will be a mezzanine with an approximate floor area of 1,035m^2

A dock office shall be located to the north of building 2. This office is single storey and approximately 200m^2.

The site is served by a single entry and exit onto Yarrawa Street.

1.1 Current Legislation

The applicable legislation governing the design of buildings is the Environmental Planning and Assessment Act 1979. This Act requires that all new building works must be designed to comply with the BCA.

The version of the BCA applicable to the development is the version that is in place at the time of the application to the Certifying Authority for the Construction Certificate. For the purposes of this assessment, BCA 2012 has been used as the benchmark for assessment being the version of the BCA applicable at the time of preparation of this report.

1.2 Consent Authority May Require The Building To Be Upgraded

The local authority when assessing the development application may require that the existing building be brought into partial or full compliance with the current provisions at the BCA. The trigger for upgrade includes:

- Where the building works, together with any other works completed or authorised within the previous 3 years, represents more than half the total volume of the building; or
- Council are not satisfied the measures contained in the building are not adequate for the safety of present using the building or prevention of special to adjacent buildings.

2.0 Building Assessment Data

Summary of Construction Determination: -

	Warehouse / Mezzanine / Office (Dock) / Loading Dock
Classification	7b / 7b / 5 / 7b
Number of Storeys Contained	2
Rise In Storeys	3
Type of Construction	Type B
Effective Height (m)	<12m

Summary of the floor areas and relevant populations where applicable: -

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Assumed Population
Existing Warehouse	7b	28,110	656
Existing Office	5	1,272	128
Proposed Warehouse	7b	13,250	37
Proposed Mezzanine	7b	1,035	

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Assumed Population
Proposed Loading Dock	7b	1,710	
Proposed Office (Dock)	5	200	
	Total	**45,577m²**	**821**

Notes:
1. This report has focused on the principal warehouse expansion, which contains the proposed warehouse and office facilities. The building has been assessed on the basis that it be considered one compartment. This consideration is based upon the Class 5 office being less than 10% of the total floor area of the building, permitting the building as a whole to be classified Class 7b.
2. In accordance with Clause C1.2 of the BCA, the Class 7b has an average internal height in excess of 6m, therefore this portion is counted as containing two storeys, in the portion with the mezzanine above.
3. The floor areas have been adjusted by a factor 0.7, with ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in warehouse areas not calculated as part of floor area.
4. The above populations for the proposed elements are based upon documentation provided by Goodmans, 17.01.13. The existing facility however is based upon floor areas and calculated population nos. using Clause D1.13 of the BCA.

3.0 Structural Provisions

Any new structural works are to comply with the applicable requirements of AS/NZS 1170.1. Please note that with the adoption of BCA2012, AS1170.2-2011 is applicable to the development.

Glazing is to comply with AS1288, and AS2047.

Prior to the issue of the Construction Certificate structural certification is required to be provided.

4.0 Fire Resistance

The warehouse, office and loading dock should be constructed generally in accordance with Table 4 of Specification C1.1 of the Building Code of Australia 2012. The building is required to be Type B Construction.

Fire resistance levels for building structural members are as follows:
- Warehouse (including office) 240 minutes

It is proposed to rationalise the FRL's provided to structural elements as part of the alternate solution. This will be verified to BCA Performance Requirement CP1.

The building has been assessed as one fire compartment.

As the building exceeds the area / volume limitations of the BCA provisions, the building is considered a large isolated building and the following provisions apply:

- Automatic sprinkler protection to AS2118.1 and BCA specifications E1.5 throughout the development with smoke detection and alarm system in accordance with AS1670, and
- Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter, and
- Smoke exhaust or smoke and heat vents required throughout the development, and
- A Ring Main is to be provided as part of the Hydrant System in accordance with AS2419.1-2005.

Perimeter vehicular access is required to be provided around large isolated buildings. This access is required to be continuous around the building in its entirety, 6m in width, with the furthest part of that access not more than 18m away from the external walls of the building. The perimeter vehicular access throughout is also required to be provided with unobstructed height. The proposed vehicular access necessitates passing through the truck breezeway. This area is considered to have obstructed height.

It is proposed to address the perimeter vehicular access and smoke hazard management as part of the alternate solution to BCA Performance Requirements CP9 and EP2.2.

4.1 Passive Fire Protection

Other passive fire protection issues that will need to be addressed in detailed documentation phase include:

- Emergency power supply,
- Emergency generators,
- Electricity supply,
- Boilers or batteries,
- Hydrant Pump rooms,
- Sprinkler Pump Rooms,
- Plant Rooms containing emergency equipment,

To be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes.

4.2 Fire Hazard Properties

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to specification C1.10 Building Code of Australia.

5.0 Egress

The egress provisions from the proposed building are provided by:

- External perimeter doorways
- Required, non-fire isolated stairways

Other detailing issues that will need to be addressed include:

- Door Hardware
- Exit door operation
- Handrail and balustrade construction

5.1 Exit Travel Distances

The travel distance to, and distance between exits have been assessed to exceed the deemed-to-satisfy provisions of the BCA. It is proposed to assess the extended travel distances as part of the alternate solution to BCA Performance Requirements DP4 and EP2.2.

The following travel distances are to be verified as part of the alternate solution:

- Travel distance to a point of choice or single exit: Up to 30m in lieu of 20m
- Travel distance to an exit where two or more are available: Up to 100m in lieu of 40m
- Distance between alternative exits: Up to 105m in lieu of 60m

5.2 Dimensions of Exits

Minimum dimensions of 1000mm and 2000mm height to be provided within exits, with the paths of travel should provide a minimum width of 1000mm (note that all maintenance access, cat walks, etc may comply with AS1657 in which case a 600mm clear width is required).

The following table summarises the exit widths required:

Floor Level	Exit Width Provided	Number of people	Exit Width required
Warehouse	12m	37	1m
Loading dock	1m		1m
Office	1m		1m

Doorways are permitted to contain a clear opening width of 750mm with a height of 1980mm as part of egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e minimum 920 mm doors).

5.3 Balustrading and Handrail

Balustrading to a height of 1000mm with a maximum opening of 125mm in any direction should be provided adjacent to balconies, landings, corridors etc where located adjacent to a change in level exceeding 1000mm.

Where it is possible to fall more than 4m to the finished floor, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing.

5.4 Access for Persons with a Disability

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D3.2, D3.3 and D3.4 of the BCA 2011. Parts of the building required to be accessible shall comply with the requirements of AS1428.1-2009.

Where the main public entrance is via a ramp, tactile indicators shall be provided in accordance with AS 1428.4 at the top and bottom. Facilities services and features of the building accessible to people with disabilities shall be identified by signage complying with Clause D3.6 of the BCA.

General

Access is to be provided to and within the whole building pursuant to AS1428.1-2009 as follows:
- From the main points of pedestrian entry at the allotment boundaries (i.e. the street),
- From the required accessible car-parking spaces on the allotment,
- Via the principle public entry and at least 50% of all other entrances,
- To and within all areas normally used by occupants.

Note that entrances that are not accessible are to be located within 50m of an entrance that is accessible.

6.0 Fire Services & Equipment

The following fire services will need to be provided throughout the building:

- An automatic sprinkler system in accordance with the relevant provision of clause E1.5 of the BCA and AS 2118.1-1999 throughout the warehouse and office building.
- Fire hydrants in accordance with clause E1.3 of the BCA and AS 2419.1-2005,
- Fire hose reels in accordance with clause E1.4 of the BCA and AS 2441-2005,
- Portable Fire Extinguishers in accordance with Clause E1.6 of the BCA and AS 2444-2001,
- Emergency lighting, exit signage and directional exit signage is required throughout the building in accordance with Part E of the BCA and AS/NZS 2293.1-2005

A Fire Control Centre is not required to be provided in accordance with Clause E1.8 of the BCA, however provision is to be made to facilitate the management of fire services.

6.1 Fire Hydrants

A system of Fire Hydrants is to be provided to BCA Clause E1.3 and AS 2419.1-2005. We will reply upon design certificate from a Hydraulic Consultant.

A booster assembly will be required as part of the fire hydrant requirements. The booster is to be located attached to the building at the main entry or, if remote from the building, located at the main vehicle entry and within sight of the main entry of the building within 20m of a hardstand area.

It is anticipated that external hydrants will be utilised on site where possible to provide coverage. Where hydrants are located under awnings, it is proposed to consider them as external hydrants in lieu of being considered as internal as outlined in AS 2419.1-2005. This is to be verified as part of the alternate solution to BCA Performance Requirement EP1.3.

Internal fire hydrants are to be provided within 4.0m of required exits. A Ring Main is to be provided as part of the Hydrant System in accordance with AS2419.1-2005.

6.2 Fire Hose Reels

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441.

To be located within 4m of exits and provide coverage within the building based on a 36m hose length. It is anticipated that internal hose reels may be required to provide coverage that are not adjacent to an internal hydrant or within 4m of an exit. The location of these hose reels is to be assessed to BCA Performance Requirement EP1.1.

Please note that fire hose reel coverage cannot pass through fire or smoke doors.

6.3 Automatic Sprinkler Protection

An Automatic Fire Suppression System is required to Specification E1.5 and AS2118.1-1999 throughout.

Location of pumps, tanks, FIP, control valves and booster are to be advised.

An occupant warning system that is triggered upon activation of the sprinkler system should be provided in accordance with BCA Specification E1.5.

7.0 Ventilation and Smoke Hazard Management

Smoke hazard management shall be provided throughout the building by means of the following systems:

- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-1998;
- Automatic Smoke Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2b
- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2004

It is proposed to rationalise the smoke hazard management via a mix of both natural and mechanical exhaust. To building 1 (north) a rationalised smoke exhaust system is proposed and will need to be assessed as part of the alternate solution to BCA Performance Requirements EP2.2. While within building 2 (south) a manual smoke clearance system is proposed and shall be assessed as part of the alternate solution to BCA Performance Requirements EP2.2.

A fire indicator panel is required as part of the detection system. This panel is to be located within 4m of the main entry and should be incorporated within a room for the purposes of managing a fire event. Any variation to the prescriptive provisions will require the consent of the fire brigade and should form part of the fire safety engineering report to verify the performance requirements of the BCA.

Throughout the development the provision of natural or mechanical ventilation is required to all habitable rooms in accordance with F4.5 Building Code of Australia and AS 1668 and AS/NZS 3666.1.

8.0 Sanitary Facilities

The sanitary & other facilities within the development shall be provided at the rate of 1 WC per 20 male occupants, 1 WC per 15 female occupants and 1 basin per 20 occupants. Urinals are to be provided at the rate of 2 for the first 50 male occupants, and 1 per 50 male occupants above 50.

Class	Occupant Number	Pop	Required			Proposed		
			WC	Urinals	Basins	WC	Urinals	Basins
5 & 7b	Male	22	2	1	2	3	1	2
	Female	15	1	NA	1	2	NA	2
	Unisex Facility	-	1	NA	1	1	NA	1

Please note the Unisex facilities provided for people with disabilities may be counted once for each sex. These facilities are to be provided in accordance with AS1428.1-2009.

Ambulant facilities are shown to be provided where an accessible facility is provided.

The existing sanitary facilities that serve the existing building elements are assumed to be adequate to cater for the occupants of those buildings. No assessment of these facilities has been undertaken. The above table pertains to the proposed facilities in isolation.

Where detailed fit-out is pending, analysis will be undertaken once tenants and indicative layouts/tenant numbers are known.

9.0 Energy Efficiency

The proposed development shall comply with Part J of the BCA. To achieve compliance, there are two options available:

1. The building can comply with the deemed-to-satisfy provisions of the BCA, relating to the following areas:
   - Building Fabric
   - Glazing
   - Building Sealing
   - Air Conditioning & Ventilation Systems
   - Artificial Lighting & Power
   - Hot Water Supply

2. The building can be verified against a reference building as per Verification Method JV3. This requires that the proposed building and its services be shown to have an annual energy consumption of equal or less than the reference building which has been modelled as per the requirements of Part J of the BCA.

Certification from an appropriately qualified engineer should be provided for either option with a report / computations outlining how compliance is achieved.

Access for maintenance is to be provided to the building in accordance with the requirements of BCA Part J8.

The proposed site will be located in a **climate zone 5**.

9.1 Access for Maintenance

Access is to be provided to all plant, equipment and components associated with the provision of the above energy requirements i.e.

- Adjustable or monitored shading devices
- Time switches and motion detectors
- Room temperature thermostats
- Plant thermostats such as boilers or refrigeration units
- Motorised air dampers and central valves
- Reflectors, Lenses and Diffusers of light fittings
- Heat transfer equipment

Appendix A - Design Documentation

The following documentation was used in the assessment and preparation of this report: -

Drawing No.	Title	Date	Drawn By	Revision
4167_DA001	Site Plan / Ground Floor	20.02.13	Nettletontribe	A
4167_DA002	Site Plan / Roof Plan	20.02.13	Nettletontribe	A
4167_DA011	Building 1 – Ground Floor Plan Expansion	20.02.13	Nettletontribe	A
4167_DA012	Building 1 – Roof Plan Expansion	20.02.13	Nettletontribe	A
4167_DA015	Building 2 – Ground Floor Plan Expansion	20.02.13	Nettletontribe	A
4167_DA016	Building 2 – Mezzanine Floor Plan	20.02.13	Nettletontribe	A
4167_DA017	Building 2 – Roof Plan Expansion	20.02.13	Nettletontribe	A
4167_DA018	Building 2 – Dock Office	20.02.13	Nettletontribe	A
4167_DA020	Site Elevations	20.02.13	Nettletontribe	A
4167_DA021	Building 1 – Elevations Expansion	20.02.13	Nettletontribe	A
4167_DA025	Building 2 – Elevations Expansion	20.02.13	Nettletontribe	A
4167_DA031	Sections	20.02.13	Nettletontribe	A
4167_DA041	Building 1 – Rendered Elevations	20.02.13	Nettletontribe	A
4167_DA045	Building 2 – Rendered Elevations	20.02.13	Nettletontribe	A
4167_DA061	Traffic Management Plan	20.02.13	Nettletontribe	A

Appendix B - Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Automatic Fail Safe Devices	BCA Clause D2.19 & D2.21
2.	Automatic Fire Detection and Alarm System	BCA Spec. E2.2a & AS 1670 – 2004
3.	Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999
4.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005
5.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005 Alternate solution to BCA Performance Requirement EP4.2
6.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005 Alternate solution to BCA Performance Requirement EP1.1
7.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005 Alternate solution to BCA Performance Requirement EP1.3
8.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
9.	Paths of Travel	EP&A Reg 2000 Clause 186 Alternate solution to BCA Performance Requirement DP4 & EP2.2
10.	Perimeter Vehicular Access	BCA Clause C2.4 Alternate solution to BCA Performance Requirement CP9
11.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
12.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 1998 Alternate solution to BCA Performance Requirement EP2.2
13.	Warning and Operational Signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 – 2005, BCA Clause C3.6, D2.23, E3.3

Appendix C- Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2012:

Table 4 TYPE B CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building—FRL: (in minutes)			
	Structural adequacy| Integrity| Insulation			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 8**
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—				
For *loadbearing* parts—				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 30	120/ 90/ 60	180/120/ 90	240/180/120
3 to less than 9 m	90/ 30/ 30	120/ 30/ 30	180/ 90/ 60	240/ 90/ 60
9 to less than 18 m	90/ 30/–	120/ 30/–	180/ 60/–	240/ 60/–
18 m or more	–/–/–	–/–/–	–/–/–	–/–/–
For non-*loadbearing* parts—				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 30	–/ 90/ 60	–/120/ 90	–/180/120
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*, where the distance from any *fire-source feature* to which it is exposed is—				
less than 3 m	90/–/–	120/–/–	180/–/–	240/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90 / 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
Fire-resisting lift and stair *shafts*—				
Loadbearing	90/ 90/ 90	120/120/120	180/120/120	240/120/120
Fire-resisting stair *shafts*				
Non-*loadbearing*	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding *public corridors*, public lobbies and the like—				
Loadbearing	60/ 60/ 60	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—				
Loadbearing	60/ 60/ 60	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
OTHER LOADBEARING INTERNAL WALLS and COLUMNS—	60/–/–	120/–/–	180/–/–	240/–/–
ROOFS	–/–/–	–/–/–	–/–/–	–/–/–