



# **BUILDING CODE OF AUSTRALIA REPORT**

## **Vincentia Market Place - Stage 1**

Dated: **11 November 2011**

Prepared for: **Woolworths Limited**

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## Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by (refer appendix A) for compliance with the Building Code of Australia 2011.

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: -

1. Travel distance to a point of choice within a major tenancies of up to 26 metres (DP4 and EP2.2)
2. Egress Travel distances within the shopping centre of up to 75 metres to an exit (DP4 and EP2.2)
3. Distance between exits within the shopping centre of up to 100 metres (DP4 )
4. Emergency Vehicular access to the development on three sides in lieu of four, (CP9)
5. Smoke Hazard management throughout the facility shall be rationalised and verified in accordance with Performance Requirement EP2.2 of the BCA.
6. Location if fire control centre EP1.6 of the BCA.

The fire engineered solution relating to CP9, EP1.6 and 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 accessibility provisions, door hardware, specifications, service design, at construction certificate stage.

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

Vanessa Hinge  
Senior Building Surveyor  
McKenzie Group Consulting (NSW) Pty Ltd



## 1. Introduction

The proposed development involves the construction of a new marketplace in Vincentia, located on the corner of Naval College Road and Moona Creek Road. Access to the site is to be provided from both The Wool Road and Moona Creek Road. The development is to be carried out in two (2) stages, with stage 1 forming the basis of this assessment.

Stage 1 of the development will comprise of the three (3) major tenancies, commercial areas, two (2) mini major tenancies, food court area and seating and up to sixty (60) tenancies. Covered mall areas, a Boardwalk, Arbour Walk and Canopy Walk are to be incorporated into the development

## 2. Building Assessment Data

Summary of Construction Determination: -

Classification	6, 7a
Number of Storeys Contained	2
Rise In Storeys	2
Type of Construction	Type C
Effective Height (m)	< 12m

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

Part of Project	BCA Class	Approx. Floor Area (m <sup>2</sup> )	Approximate Volume (m <sup>3</sup> )	Assumed Population
Specialties and Kiosks	6	5716	TBA	1561
Major tenancy - Big W	6	7457	TBA	1740
Major tenancy - Woolworths	6	3894	TBA	909
Major tenancy - Aldi	6	1040	TBA	243
Mall areas	6	2022	TBA	283
Plant	6	372	TBA	13
MM1	6	580	TBA	135
MM2	6	720	TBA	168
<b>Total</b>	<b>6</b>	<b>21801</b>		<b>5052</b>



Notes:

1. The above populations have been base on the floor areas and calculations in accordance with Table D1.13 of the BCA.
2. The floor areas of major and mini major retail areas have been adjusted (by a factor of 0.7) without ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in storage areas.
3. Please note that if population numbers are incorrect, please advise for further assessment and comments.

### 3. Fire Resistance

The buildings should be constructed generally in accordance with Table 5 specification C1.1 of the Building Code of Australia 2011. The building has been assessed as a "large isolated building" in accordance with Clause C2.3 of the BCA, therefore the following shall be required:

1. Perimeter access for emergency vehicles (CP9)
2. Sprinkler protection throughout the facility
3. Smoke Hazard management (EP2.2)
4. Fire Hydrant Ring Main

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

- Electricity supply,
- Hydrant Pump rooms,
- Sprinkler Pump Rooms,

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

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.

### 4. Egress

The egress provisions form the proposed building are provided external perimeter doorways and the Board Walk via canopy walks. For the purposes of this assessment, the mall area has not been considered to be a place of relative safety.

The assessment below outlines the key elements of the preliminary assessment to be included within the fire engineered solution for the development.

#### 4.1 Dimensions of Exits and Paths of Travel to Exits

Egress from the marketplace, is proposed to be via exits located around the perimeter of the building that discharge to areas of open space (i.e. carpark) that provide direct access to the road.

The total aggregate egress required to be from the marketplace to achieve compliance with D1.6 is approximately 45 metres. This is based on the following assumptions:

1. Major tenancies will be provided with adequate aggregate egress width based on their assumed populations, these have been determined as follows:-
  - a) Big W: a total aggregate egress width of 14.9 metres
  - b) Woolworths: a total aggregate egress width of 8.2 metres
  - c) Aldi: a total aggregate egress width of 3.1 metres



Required aggregate egress width for Stage 1 of the marketplace, will be achieved and compliance will be verified with the documentation submitted for the issue of the construction certificate.

#### 4.2 Travel Distances – Specialty and Mini Majors Tenancies

Specialty stores are capable of achieving a travel distance of 20 metres to a point of choice. The mini major tenancies, (MM1, MM2 and tenancies indicated on leasing plan as 57) will be provided with a second exit to achieve a maximum travel distance of 20 metres to a point of choice.

Extended travel distances to exits up to 65 metres from tenancies are indicated in the design documentation this is in lieu of the DTS provision of 40 metres.

#### 4.3 Travel Distances – Major Tenancies

This preliminary assessment of travel distances within the major tenancies (Woolworths, Big W and Aldi) has been carried out and assessed, and the following distances being determined:-

##### *Big W*

Travel distances in Big W have been assessed against the deemed-to-satisfy provisions of the Building Code of Australia, the result of this assessment has determined an extended travel distance to an exit of up to 75 metres, in lieu of 40m.

The proposed performance based solution of fire isolating the passageway along the south-eastern wall of the store will reduce the extended travel distances to an exit, with travel distances of up to 60 metres to an exit.

This item will be required to be addressed by the Fire Engineer in accordance with Performance Requirements DP4 and EP2.2 of the BCA.

##### *Woolworths*

The travel distances in the Woolworths tenancy have been assessed against the deemed-to-satisfy provisions of the Building Code of Australia, travel distances of up to 60 metres to an exit. A performance based assessment for this non-compliance is proposed.

In addition, the distance of travel to a point of choice is extended to 26 metres in lieu of the BCA deemed-to-satisfy provision of 20 metres.

These items will be required to be addressed by the Fire Engineer in accordance with Performance Requirements DP4 and EP2.2 of the BCA.

##### *Aldi*

The travel distances in the Aldi store have been assessed against the deemed-to-satisfy provisions of the Building Code of Australia, this assessment has revealed travel distance of up to 50 metres to an exit. A performance based assessment for this non-compliance is proposed.

This item will be required to be addressed by the Fire Engineer in accordance with Performance Requirements DP4 and EP2.2 of the BCA.

#### 4.4 Distances between Alternative Exits

The following distances between alternative exits, have been determined in excess to the BCA prescriptive provision of up to 60 metres:

- Woolworths: up to 80 metres
- Aldi: up to 85 metres
- Big W: up to 110 metres
- The Marketplace: up to 95 metres



Therefore this item will be required to be addressed by the Fire Engineer in accordance with Performance Requirements DP4 and EP2.2 of the BCA.

#### 4.5 After hours egress

Provision for safe egress should be made for staff occupying the major tenancies after hours. It is understood that the main entrances to the major tenancies from the mall areas are to be closed after hours, with a combination of glazed doors and roller shutters

To allow safe egress for after hours staff, breakout doors (or other appropriate means of egress) should be provided from the major tenancies to the mall area.

#### 4.6 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. 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.

Accessways designed to comply with AS14281-2009 are to be provided to the following areas:-

- from the public road to the main entrance of the building
- from accessible carparks to the entrance of the building

Mezzanines in major tenancies where they are proposed to have a floor area of more than 200m<sup>2</sup> are to be provided with a lift for the use by people with disabilities, the lift is to have comply with the provisions of E3.6 of the BCA.

Carparking spaces are to be designed to comply with AS2890.6 and are to be provided at a rate of 1 accessible carparking space for every 50 carparking spaces provided.



## 5. 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,
- 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 required for this building, as the floor areas exceed 18,000m<sup>2</sup>. The fire control centre is to be designed to meet the provisions of Clause E1.8, access to the fire control centre will involve a change in level from the public road of more than 300mm, as such, this non-compliance is to be verified by the fire engineer through consultation with Fire and Rescue NSW.

## 6. Ventilation and Smoke Hazard Management

Smoke hazard management shall be provided throughout the building in accordance with EP2.2 of the BCA. The deemed-to-satisfy provisions of the BCA require the provision of an automatic smoke exhaust system to specification E2.2b. The smoke exhaust requirements shall be assessment as part of the fire safety engineering report and submitted for comment to the NSW fire Brigades.

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.

## 7. Sanitary Facilities

The sanitary & other facilities within the development would generally consist of: -

### 7.1 Requirements for facilities for Staff

The following calculations provide an indication to the number of facilities that are required to accommodate staff in these tenancies. These calculations are based on the following staff numbers:-

- Woolworths 50 staff
- Aldi 30 staff
- Big W 50 staff
- Mini Majors 10 staff per tenancy





	Staff Number			WC	Urinal	Basin
Woolworths	50	Male	25	2	1	1
		Female	25	2	N/A	1
		Unisex Wheel Chair Accessible		1	N/A	1
	<b>Sub-Total Required</b>			<b>5</b>	<b>1</b>	<b>3</b>
Aldi	30	Male	15	1	1	1
		Female	15	1	N/A	1
		Unisex Wheel Chair Accessible		1	N/A	1
	<b>Sub-Total Required</b>			<b>3</b>	<b>1</b>	<b>3</b>
Big W	50	Male	25	2	1	1
		Female	25	2	N/A	1
		Unisex Wheel Chair Accessible		1	N/A	1
	<b>Sub-Total Required</b>			<b>5</b>	<b>1</b>	<b>3</b>
Mini Majors (MM1 & MM2)	10	Male	5	1	1	1
		Female	5	1	N/A	1
		Unisex Wheel Chair Accessible		1	N/A	1
	<b>Sub-Total Required</b>			<b>3</b>	<b>1</b>	<b>3</b>

The calculations of in the table below have been based on the following staff numbers:

- Specialties 46 specialties at 2 staff per tenancy

Specialties and kiosks	86	Male	46	3	2	2
		Female	46	4	N/A	2
		Unisex Wheel Chair Accessible		1	N/A	1
	<b>Total Required</b>			<b>6</b>	<b>2</b>	<b>3</b>

## 7.2 Requirements for facilities for Patrons

The table below outlined the sanitary facility requirements for patrons to the Marketplace.

	Patron Number			WC	Urinal	Basin
Patrons	4816	Male	2408	3	3	3
		Female	2408	4	N/A	3
		Unisex Wheel Chair Accessible		1	N/A	1
	<b>Total Required</b>			<b>6</b>	<b>3</b>	<b>5</b>

Please note that Unisex facilities provided for people with disabilities may be counted once for each sex. These facilities are to be provided in accordance with AS1428.1-2001.

Where detailed fitout is pending analysis will be undertaken once tenants and indicative layouts/tenant numbers are known.



## 8. Energy Efficiency

As the proposed development is to include conditioned space (i.e. any form of climate control), as such, BCA2011 requires that compliance with the energy provisions (Part J) be achieved.

The building has been identified as being located within a Climate Zone 6.

The options available to demonstrate compliance are:

- a) Comply with JV3, which includes modelling to determine the annual energy consumption; or
- b) Comply with the deemed-to-satisfy provisions in relation to:
  - i. Building Fabric
  - ii. External Glazing
  - iii. Building dealing
  - iv. Air conditioning and ventilation systems
  - v. Artificial light and power
  - vi. Access of maintenance and facilities for monitoring

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



## Appendix A - Design Documentation

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

DRAWING NO.	Title	Issue	Date	Drawn By
L001	Leasing Plan	A	9.11.11	Scott Carner



## Appendix B - Draft Fire Safety Schedule

	Items to be inspected or tested as nominated by the relevant authority	Deemed to satisfy installation standard/code/conditions of approval
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.	Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5 & AS 1670 – 2004
5.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 1998
6.	Emergency Evacuation Plan	AS 3745 – 2002
7.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 1998
8.	Fire Doors	AS 1905.1 – 1997
9.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
10.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005
11.	Fire Seals	BCA Clause C3.15 & AS 1530.4 – 1997
12.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
13.	Paths of Travel	EP&A Reg 2000 Clause 186
14.	Perimeter Vehicular Access	BCA Clause C2.4
15.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
16.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 1998
17.	Warning and Operational Signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 – 1997, BCA Clause C3.6, D2.23,



## Appendix D- Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2010:

Table 5 TYPE C CONSTRUCTION: FRL OF BUILDING ELEMENTS Building element	Class of building—FRL: (in minutes)			
	<i>Structural adequacy/ Integrity/ Insulation</i>			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
<b>EXTERNAL WALL</b> (including any column and other building element incorporated therein) or other external building element, where the distance from any <i>fire-source feature</i> to which it is exposed is—				
Less than 1.5 m	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
1.5 to less than 3 m	- / - / -	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
3 m or more	- / - / -	- / - / -	- / - / -	- / - / -
<b>EXTERNAL COLUMN</b> not incorporated in an <i>external wall</i> , where the distance from any <i>fire-source feature</i> to which it is exposed is—				
Less than 1.5 m	90/ - / -	90/ - / -	90/ - / -	90/ - / -
1.5 to less than 3 m	- / - / -	60/ - / -	60/ - / -	60/ - / -
3 m or more	- / - / -	- / - / -	- / - / -	- / - / -
<b>COMMON WALLS and FIRE WALLS—</b>	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
<b>INTERNAL WALLS-</b>				
Bounding <i>public corridors</i> , public lobbies and the like—	60 / 60/ 60	- / - / -	- / - / -	- / - / -
Between or bounding <i>sole-occupancy units</i> —	60/ 60/ 60	- / - / -	- / - / -	- / - / -
Bounding a stair if <i>required</i> to be rated—	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
<b>ROOFS</b>	- / - / -	- / - / -	- / - / -	- / - / -

