AXIS DEVELOPMENT

STAGE 1A, 6 AUSTRALIAN AVE
&
STAGE 2A, 2 HERB ELLIOT AVE
SYDNEY OLYMPIC PARK

STRUCTURAL DESIGN BRIEF

DESIGN BRIEF: - 2944 DB1

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ISSUE: B

REVISION	DATE	ORIGINATOR	CHECKED	APPROVED	REMARKS
A	MARCH 2013	JR	JR		
B	APRIL 2013	JR	JR		

1. PROJECT DESCRIPTION

1.1 General

The project involves the construction of an 11 storey office/commercial building with a 2 storeys of basement carparking.

The building contains mixed use on the podium level at ground floor with a supermarket, loading dock, retail, substation and public space.

2. SCOPE OF WORK

2.1 Design and Documentation of the following:

- Footings, retaining walls and shoring
- Lift cores, stairs and stair walls
- Columns
- Basement slab on ground
- Additional steelwork for support of atrium facade
- Post tensioned floor slabs (concrete outline only)
- Reinforced car park ramps
- Substation false floor structure at ground floor
- Steelwork to roof of plantroom on concrete roof

3. CODES

The structural design of the project will be carried out in accordance with the following Australian Standard Codes of Practice.

- Building Code of Australia
- AS 1170 Part 0 General Principles
- AS 1170 Part 1 Permanent, imposed and other actions
- AS 1170 Part 2 Wind actions
- AS 1170 Part 4 Earthquake
- AS 3600 Concrete Structures Code
- AS 4100 Steel Structures Code
- AS 3700 Masonry Code

4. LOADING CRITERIA

4.1 Vertical Loads

- **Car park (level B1/B2)**
  - Car Park & Ramps — 0.25 kPa dead load, 2.5 kPa live load
  - Switchroom & Plant Rooms — 2.5 kPa dead load, 5 kPa live load
  - Amenities — 1.5 kPa dead load, 2 kPa live load
  - Lift foyer — 1.5 kPa dead load, 4 kPa live load

- **Ground Floor Podium**
  - External Public Space — 7.5 kPa dead load (300mm paving)
5 kPa live load
  - Supermarket and Retail — 2.5 kPa dead load
4 kPa live load
  - Deep Planter Zone Grid M — 21.5 kPa dead load
5 kPa live load
  - Garbage/Recycling — 0.5 kPa dead load
10 kPa live load
  - Loading Dock — 0.5 kPa dead load
10 kPa live load
  - Plant Rooms — 2.5 kPa dead load
5 kPa live load
  - Amenities — 1.5 kPa dead load
2 kPa live load
  - Foyer/cafe — 2.5 kPa dead load
4 kPa live load
  - Substation — 8 kPa dead load
15 kPa live load
  - Roadway — 3.5 kPa dead load
15 kPa live load
- **Level 1 – 7**
  - Office/Commercial — 1 kPa dead load
3 kPa live load
  - Amenities — 1.5 kPa dead load
2 kPa live load — blockwall self weight
  - Lift Corridor — 1.5 kPa dead load
4 kPa live load
  - Stairs — 4 kPa live load
  - Balconies — 1.5 kPa live load (50 topping + ceiling under)
4 kPa live load
- **Stage 1A lid slab level 1 (over basement entry grid 4 to 6 & G to K)**

  1 kPa Dead Load
7 kPa Live Load
- **Plant Level**
  - General Roof Area — 2.25 kPa dead load *
2 kPa live load

  * Includes allowance for 40mm average insitu concrete topping to provide falls to rainwater outlets on roof + ballast and ceiling/services under
  - General Plant Room — 2.5 kPa dead load
5.0 kPa live load
  - Cooling Tower Room/Generator Room — 2.5 kPa dead load
10 kPa live load

Steel Roof to Plantroom

Dead Loads:

Self weight of roof sheeting and pulins = 12 kglm²

Lights, ducks + service = 50 kglm²

Live Loads (in accordance with AS 1170.1) 2.5 kglm²

4.2 Wind Loads

Wind loads will be assessed in accordance with AS 1170 Part 2, using the following parameters:

- Annual probability of exceedance = 1 in 500
- Region A2, V_u = 45 m/second
- Terrain Category 3
- Topographic multiplier 1.0
- Shielding multiplier 1.0

4.3 Earthquake Loads

Earthquake Loads will be assessed in accordance with AS 1170.4-2007, BCA, & AS 1170.0 – 2002 with the following parameters:

- Annual probability of exceedance = 1 in 500 (ultimate)
- Z= 0.08
- Kp = 1.0
- Site subsoil class = Be (rock)
- Earthquake design categogy II

5. SERVICEABILITY

5.1 Lateral Deflection

Site sub soil areas Be earth quake design category II

Maximum Interstorey drift due to wind, earthquake – Floor Height/500 (serviceability)

Maximum interstorey drift due to ultimate earthquake -1.5% storey height

5.2 Vertical Deflection

• All floors	Total Deflection:	span/250 and less than 25mm span/125 at cantilevers
(area with masonry partitions)	Incremental Deflection:	span / 500 (L/250 at cantilevers)
Relative deflection between floors at façade	$\leq \pm$ 15mm	

5.3 Floor Vibrations

Office floors are to be designed to achieve an R factor of a maximum of 4 (outlined in Annexure A of AS 2670) based on 1 person walking moderately.

6. MATERIALS

6.1 Concrete

Concrete shall have river gravel or crushed basalt aggregate (no slag aggregates)

All concrete slabs are to be cured with applied curing compounds compatible with floor finishes.

6.2 Reinforcing Steel

Reinforcement shall be Grade 500 MPa

6.3 Waterproofing

The roof slab and external areas of ground floor shall be waterproofed with an applied waterproof membrane which will be the primary waterproofing element. The roof slab and external areas of ground floor will not be designed as watertight, but will have an additional layer of reinforcing mesh to control early age shrinkage cracks.

7. FOUNDATIONS

All footings and shoring/retaining walls are to be designed in accordance with the recommendations contained in the geotechnical report by Geotechnique.

8. STRUCTURAL FRAMING SYSTEM

8.1 Foundations

All columns to be supported on pad footings founded on rock. Under lateral load resisting elements (lift cores, stair wells etc), bases to be anchored using permanent rock anchors where required.

8.2 Floor Framing

It is anticipated these floors will be post tensioned band beam structures supported on reinforced concrete columns.

8.3 Lift cores and stair cores

These will resist the lateral loads on the buildings due to wind and earthquake. They will be insitu reinforced concrete and will be anchored down by permanent rock anchors.