THE STAR

MODIFICATION 13 PLANNING SUBMISSION

STRUCTURES (HOTEL TOWER)

PREPARED BY

WSP | PARSONS BRINCKERHOFF

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Date	Revision No.	No. of Pages	Issue/Description of Amendment	Prepared By	Reviewed By	Approved By	Signature
14.11.16	A	22	Skeletal Report Issue	Glenn Fyvie		K.Winward	
16.01.17	B	21	Draft Report Issue	Glenn Fyvie		K.Winward	
28.02.17	C	27	Final Report Issue	J.McCutcheon		K.Winward	
17.03.17	D	27	Revised Final Report Issue	J.McCutcheon		K.Winward	
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11.08.17	G	31	Revised Final Report	J.McCutcheon		K Winward	
15/9/17	H	32	Final Report	J McCutcheon		K Winward	

1 EXECUTIVE SUMMARY

SEGL has commenced a five-year redevelopment journey to create a landmark, exemplar integrated resort. This proposed redevelopment will occur through the lodgement of two s75W modification applications to the original Major Project Approval (MP08_0098) with the Department of Planning and Environment (the Department).

Modification 14 (Mod 14) was determined in October 2017 and included approval for a range of upgrades to the existing site. These upgrades included the enclosure of the level 3 terrace to facilitate an expansion in gaming floor area and a new bar and restaurants, expansion of the level 3 pre-function space, changes to the Astral Hotel lobby and retail space, and alterations to internal vertical transportation, services and infrastructure, including the harbour heat rejection system.

Mod 13 is a modification to the development as approved under MP08_0098, up to and including Mod 14. This forms the basis for technical impact assessments.

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MODIFICATION 13
PROPOSED WORKS

2 MODIFICATION 13 PROPOSED WORKS

Modification 13 includes the following proposed works:

2.1 NEW RITZ CARLTON HOTEL AND RESIDENTIAL TOWER

New Ritz Carlton Hotel and residential tower includes:

- Demolition of part of the existing building in the northern portion of the site, including part of the Pirrama Road façade and part of the Jones Bay Road façade.
- Construction of a new Tower, 237.0 metres AHD (approximate, 234 metres from Pirrama Road);
- Residential uses across 35 levels, comprising:
  - A residential vehicular drop off lobby on Level B2
  - A residential lobby on Level 00 to be accessed from Jones Bay Road;
  - Residential communal space on Level 07 to be accessed via Level 08; and
  - 204 residential apartments located from Levels 05 to 06 and from Levels 08 to 38, featuring one-bedroom, two-bedroom and three-bedroom unit types *(Note – no Level 13)*
- Hotel uses across 31 levels, comprising:
  - A hotel arrival lobby on Level B2 to be accessed from the new Ritz-Carlton porte-cochere along Pirrama Road;
  - A hotel Sky Lobby for guest check-in on Level 39 and 40, featuring a restaurant, bar and lounge;
  - 220 hotel rooms located from Level 42 to 58 and from Level 60 to 61
  - A hotel spa and gym on Level 07
  - A VIP link to the Sovereign Room on Level 04 and 04 Mezzanine
  - A Ritz-Carlton Club lounge and terrace on Level 59
  - Hotel staff end-of-trip facilities on Level B3
  - Hotel staff arrival point on Level 00
  - Hotel back-of-house and plant on Level B2, 02, 03, 05, 41 and 42
- A Neighbourhood Centre consisting of a cafe, library, learning / innovation hub and function centre;
- A new car-parking stacker system below the new porte-cochere of the Ritz-Carlton Hotel, with a total capacity of 221 spaces, to serve the new hotel and apartments
- Vertical transport associated with the tower and podium; and
- A new drop-off / pick up area (short-term parking) on Jones Bay Road for the proposed apartments.

2.2 LEVEL 07

New level 07 includes:

- A 'Ribbon' at Level 07 connecting the new Hotel and Residential Tower to the existing building along Pirrama Road, comprising:
  - Two pools and associated pool decks (one for the new Hotel, one for The Star); and
  - Two food and beverage premises with associated store rooms and facilities;
- Lift access from the Level 05 Terrace to Level 07;
- Residential communal open space associated with the new residential apartments, comprising pool and landscaped terrace at the base of the Tower adjacent to Jones Bay Road;
- Gym and associated change rooms and facilities for the residents;
- Gym and associated change rooms and facilities for hotel guests; and
- Landscaping treatments.

2.3 LEVEL 05 TERRACE

New level 05 terrace includes:

- Three food and beverage outlets with external areas;
- Completion of the Vertical Transportation drum to connect with Level 05 Sky Terrace;
- Designated event spaces on the Terrace; and
- Landscaping treatment.

2.4 ASTRAL HOTEL POOL AND SPA RECREATIONAL FACILITY UPGRADE

- New pool deck, pool, spa, gym and amenities upgrade for Astral Hotel and Residences.

2.5 TOWER TO SOVEREIGN LINK BY ESCALATOR AND LIFT

- Link from the Tower (across Level 04 and Level 04 Mezzanine) to the Sovereign Resort and MUEF at Level 03, connected via Lift G4, Lift VIP 1 and escalators.
- Extension of the lift service to stop at Level 00, 01 and 05 in addition to Level 3, 4 and 4M.

2.6 LEVEL 03 SOVEREIGN COLUMN FAÇADE TREATMENT ALONG PIRRAMA ROAD

- New glazed detail to enclose exposed Level 03 Sovereign columns along the Pirrama Road façade.

2.7 VARIOUS RECONFIGURATION WORKS AROUND VERTICAL DRUM LEVEL 00 TO L5A

- Revolving door at L00 main entrance landing Pirrama Road end
- Sliding door at L00 landing at stairs from Light Rail
- Reconfiguring of existing L1 and 2 void edge
- New escalators from L2 to L3 due to revised landing at Level 3
- Infill of L2 atrium void to main entrance at Pirrama Road

2.8 FAÇADE INTEGRATION WORKS

Façade integration works includes:

- Upgrades to the Pirrama Road and Jones Bay Road façades to integrate the new Ritz Carlton Hotel and Residential Tower with the existing building.

2.9 INFRASTRUCTURE UPGRADES

Infrastructure upgrades, including:

- A new plant room located within the podium over Levels 03, 04, 05 and 06 of the proposed Hotel and Residential Tower;
- Relocation of the current Level 03 cooling towers (adjacent to the MUEF) to the Level 09 plant room above the Level 06 plantroom adjacent to the Astral Hotel;
- New capstone microturbine units and associated flues in the proposed plant room at Level 03 between the Darling Hotel and the Astral Residence Tower;
- New capstone microturbine units and associated flues in the new Level 03 plant room at the base of the Tower;
- Relocation of the existing main switch-room to the new plant room on Level 02, south of the demolition area;

- Relocation of the existing data recovery centre to the new plant room on Level B1 of the Darling Hotel;
- Relocation of diesel generator flues to the side of the new Level 09 plantroom, adjacent to Astral Hotel

2.10 LEVEL B2 TRANSPORT INTERCHANGE

Transport interchange includes:

- Upgrades to the Event Centre Loading Dock;
- Entry into Basement car stacker for the Tower apartments and Ritz-Carlton Hotel;
- New commuter bike parking and hire bike system;
- Upgrade of finishes to light rail station surrounds (but not within Light Rail corridor) and removal of existing wall barrier to the Pirrama Road frontage;
- Upgraded taxi-rank arrangements;
- Designated Star coach parking along Service Road in front of Light Rail station; and
- Realignment of kerbs and line-marking.
- *Note – no works to the Light Rail corridor*

2.11 TRANSPORT IMPROVEMENTS – OTHER LOCATIONS

Transport improvements includes:

- Reconfiguration of existing median strips on Jones Bay Road and addition of new median strip on Pyrmont Street, with associated line-marking to enable a new right-hand turning lane into the Astral Hotel Porte-Cochere;
- New Pyrmont Street carpark entry and exit, associated line marking, changes to internal circulation, and reconstruction of the pedestrian footpath along Pyrmont Street; and
- Relocation of existing feeder taxi-rank from Jones Bay Road to the Level B2 transport interchange.

2.12 SITE WIDE LANDSCAPE AND PUBLIC DOMAIN UPGRADES

Site wide landscape and public domain upgrades, including:

- Upgrades to street frontages along Pirrama Road (for the Hotel Porte Cochere) and Jones Bay Road (for the residential entry);
- Upgrades to street frontage to Pyrmont Street, due to new car parking entry; and
- Entrance upgrade to the SELS building at the corner of Jones Bay Road and Pyrmont Street.

2.13 LEVEL 00-RESTAURANT STREET

- Creation of a new destination Restaurant Street by:
  - Incorporating existing Balla & Black Food and Beverage premises on Level 00; and
  - Converting existing retail shops into new Food and Beverage tenancies

2.14 PIRRAMA ROAD AND JONES BAY ROAD – FOOD AND BEVERAGE TENANCIES

- A revised food and beverage tenancy at the existing Pizzaperta outlet along Pirrama Road;
- A new food & beverage tenancy at the Marquee street entry; and
- A small café outlet adjacent to the residential lift lobby at Jones Bay Road.
- A new food & beverage tenancy accessed off existing walkway from Jones Bay Road

2.15 FOOD AND BEVERAGE – OTHER LOCATIONS

- Reconfiguration of Harvest Buffet, including new escalators from Level 00 Food Court to Level 01; and
- Refurbishment of Bistro 80 into the interim Century tenancy

2.16 DARLING HOTEL CORNERS

- Upgrade of the corner plaza at the Union/Edward Street property entry:
  - A new food and Beverage premises on Level 01 and 02;
  - A new entry foyer leading to the Food Court;
  - A relocated awning enclosure at street level;
- Upgrade of the corner plaza at the Union/Pyrmont Street property entry:
  - A new awning enclosure at for the existing café;
  - New revolving door at entry to Darling Hotel
  - Eight (8) luxury display cases at Darling Hotel car park entry; and
  - Two car display areas at Darling Hotel car park entry.

2.17 SITE-WIDE ACOUSTIC STRATEGY

- A site-wide acoustic monitoring strategy applied to assess impact of potential noise generating sources in Mod13.

2.18 SITE-WIDE LIGHTING STRATEGY

- A site-wide lighting strategy integrating and improving the existing lighting across the precinct, with new lighting the proposed Tower, Podium and Ribbon, including:
  - Internal lighting of Hotel and Residential spaces;
  - Illuminated highlights at the Sky Lobby and Club Lounge levels;
  - Integrated lighting on the eastern and western vertical façade slots and angled roof profile;
  - Podium external illumination from awnings, and under retail and lobby colonnades;
  - Landscape lighting on Level 07 open terraces and pool decks;
  - Feature lighting accentuating the wing-like profile of the Ribbon and vertical element;
  - Internal and external lighting to Food and Beverage outlet at Union/Edward Street corner;
  - Façade LED lighting to the heritage SELS Building

2.19 SPECIAL LIGHTING EVENTS

- Approval for fifty three (53) Special Lighting Event nights per year.for the use of permanent installation of moving projector lights on the rooftop of the Astral Hotel

2.20 SIGNAGE UPGRADES

- Consolidation of existing signage approvals and new signage, including:
  - Approved signs not yet installed
  - Wayfinding signs;
  - Business identification (including for Food and Beverage outlets); and
  - Signage on the Tower and Podium.

2.21 STORMWATER UPGRADES

Stormwater upgrades includes:

- Stormwater upgrade works, including increased pit inlets and pipe capacities at the low points along Pyrmont Street and Edward Street. Flood gate to Pyrmont Street carpark entry-exit ramp.

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INTRODUCTION

3 INTRODUCTION

3.1 SUMMARY

This report details key considerations and advice that have informed the design development of the tower. The principles will be the basis for the preparation of the future construction drawings.

The key structural features for the tower are as follows;

- Foundations: pad footings founded on Sandstone;
- Lateral stability system: a reinforced concrete core and outrigger system utilizing the full building footprint to optimize overall building stiffness and to minimize wind induced accelerations. Outrigger wall connections to the perimeter Mega-Columns have been located to avoid conflict with the proposed apartment and hotel layouts;
- Typical tower floor framing: generally 200mm / 220mm thick post-tensioned flat plate slabs spanning up to 10m with cantilevers up to 3m;
- Non-typical tower floor framing: generally 250mm thick post-tensioned flat plate slabs at plant floors, heavy load floors and column transition levels;
- Podium floor framing: generally banded post-tensioned slabs comprising 180 to 250mm thick slab panels and 350 to 500 thick beams;
- Gravity Columns: typically blade columns located to align with party walls. To suit the sloping and twisting building profile whilst maintaining vertical continuity the structural solution is to ‘step’ the blades as required along their longer axis. Rationalization of the column stepping is being undertaken to minimize induced horizontal thrusts into the floors and the core;
- Interface with existing structure: the tower podium is to be isolated from the existing structure via a permanent movement joint. Room planning and floor efficiency require the tower core to be located adjacent to an existing operational goods lift; and
- Wind loading: the building has been analyzed under wind loading in accordance with the Australian Standard, AS/NZS 1170.2, further development and optimization of the lateral load resisting system will be undertaken following wind tunnel testing.

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STRUCTURAL SYSTEM

4 STRUCTURAL SYSTEM

4.1 FOOTINGS

The footing system will be pad footings bearing on sandstone. Exact requirements are subject to final geotechnical testing, however, based on testing undertaken for the existing building we are confident the sandstone will be generally of good quality and suitable for pad footings.

4.2 LATERAL LOAD RESISTING SYSTEM

Lateral stability describes the systems implemented within the structure to resist against wind, earthquake and robustness forces. For tall and slender buildings wind forces are the primary factor governing the design of the building lateral stability. An outrigger system has been implemented which is comprised of a central core connected through a series of rigid horizontal walls (Outriggers), connected to perimeter columns (Mega-Columns), at discrete locations throughout the height of the building.

This system fully utilises the stability lever arm (i.e. full width of the building) and therefore in turn improves stiffness and serviceability performance (e.g. lateral drift and horizontal acceleration) of the building. The layout of the outrigger system is co-ordinated with the architecture, as the locations of outrigger walls and Mega-Columns are incorporated in between tenancies to minimise disruption to room layouts.

Whilst the “structurally ideal” core location would have been central to the floor plate, the off-set core of the FJMT scheme achieves far better architectural and operational outcomes. The use of the outrigger walls and mega columns greatly assist in achieving the design intent and will be refined through the normal cause of design development.

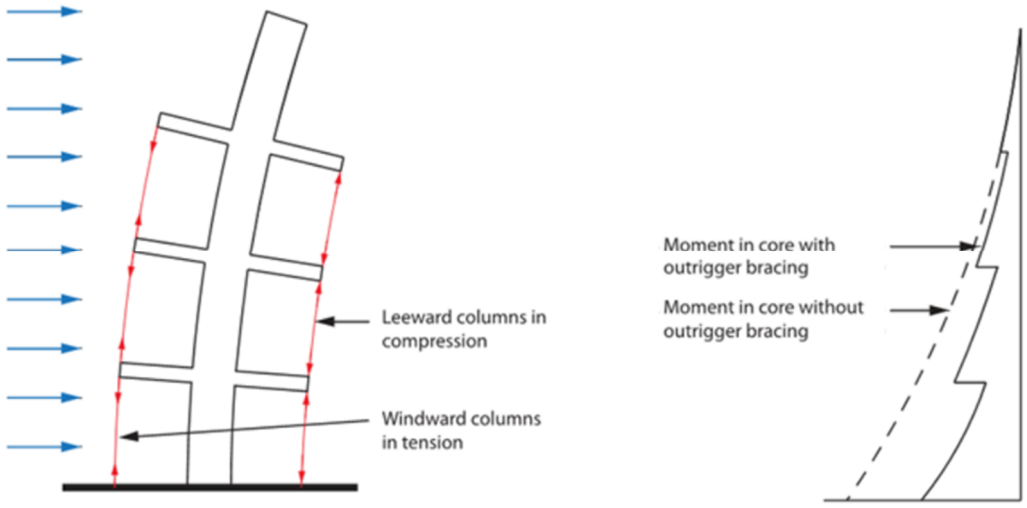

FIGURE 4.2.A OUTRIGGER SYSTEM (REF: TARANATH 1998)

Each of the structural elements comprising the lateral stability system are discussed in further detail in the sections below. At this stage, the lateral stability system is sized to resist wind loading under the Australian Standard for wind loading, AS/NZS 1170.2, however further optimization will be undertaken following wind tunnel testing.

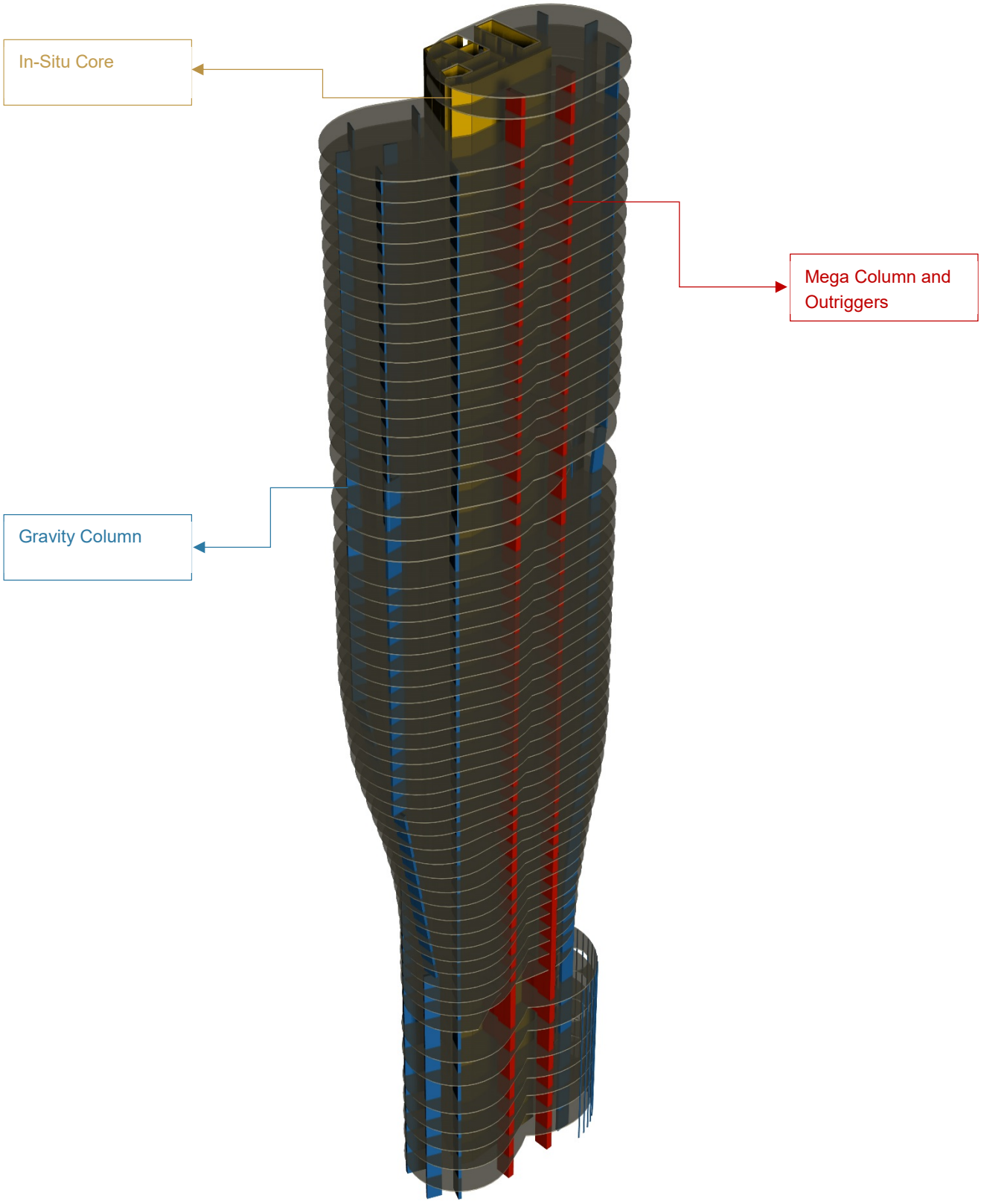

FIGURE 4.2.B LATERAL STABILITY SYSTEM

4.2.1 The Core

The reinforced concrete core acts as the building's "spine", and is comprised of the lift and stair shaft walls linked together by header beams to form a core box. The core has been designed to support loading under combined lateral and gravity effects and has been analysed using ETABS finite element software.

To produce the most economically efficient outcome, whilst striving to reduce the overall footprint of the core, concrete grades have been varied throughout the building elevation. As the lower levels carry larger loading compared to the levels above, high strength concrete has been utilized at these levels, with conventional concrete grades used further up the building height. Individual wall thickness have also been varied throughout the core section in accordance with the expected stresses as a result of our analysis (see Figure 4.2.1).

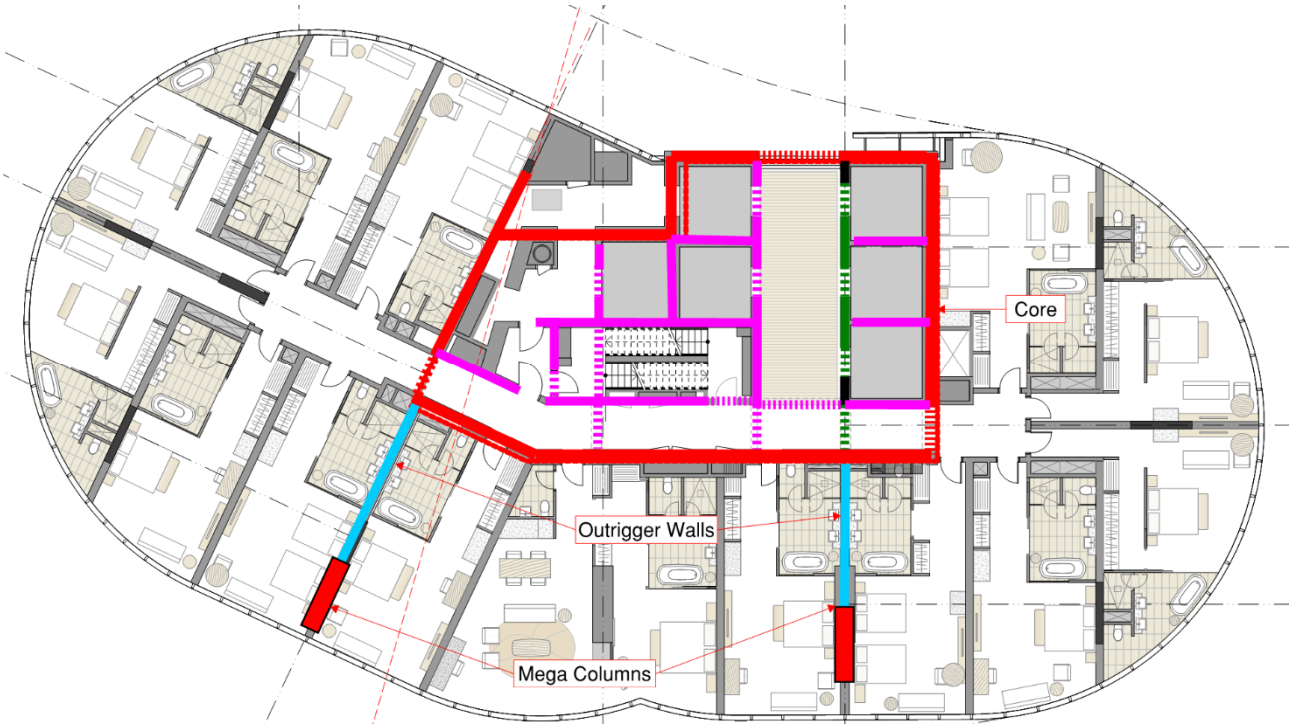

FIGURE 4.2.1 CORE LAYOUT

Legend	Base to Level 19	Level 20 to Level 41	Level 42 to Top
	600 thick Walls, N80 Concrete	500 thick Walls, N65 Concrete	400 thick Walls, N50 Concrete
	500 thick Walls, N80 Concrete	500 thick Walls, N65 Concrete	400 thick Walls, N50 Concrete
	250 thick Walls, N80 Concrete	250 thick Walls, N65 Concrete	250 thick Walls, N50 Concrete
	500 thick Walls, N80 Concrete*	500 thick Walls, N65 Concrete*	400 thick Walls, N50 Concrete*

TABLE 4.2.1 WALL THICKNESSES

Outriggers are located at discrete intervals to suit Architecture

The header beams (dashed lines in Figure 4.2.1 are 600 mm deep in the corridors and 800 mm deep in lift/stair openings. The thickness and concrete grade match the walls they span from.

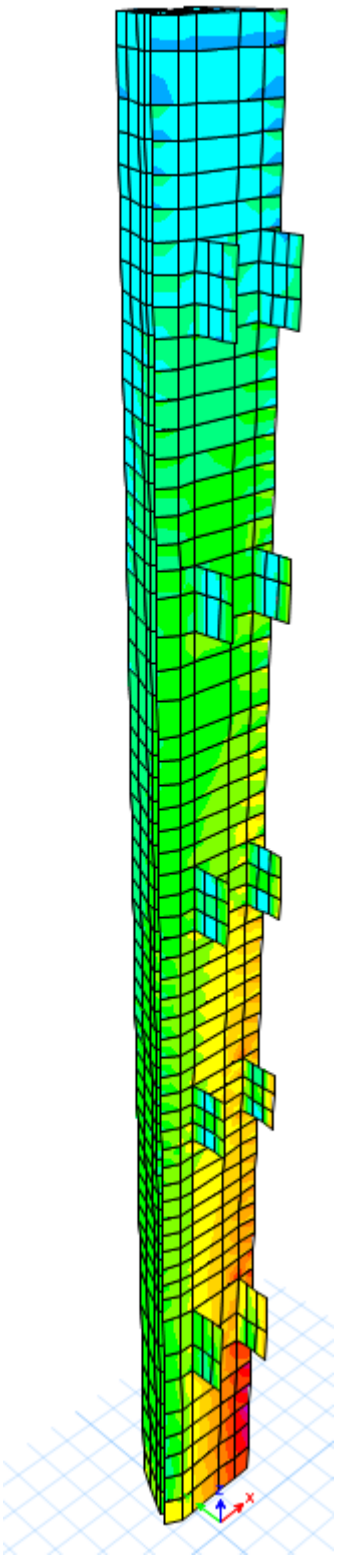

FIGURE 4.2.2 STRESS DISTRIBUTION FROM STRUCTURAL MODEL FOR THE CORE & OUTRIGGERS UNDER A GIVEN WIND DIRECTION

4.2.2 Outrigger Walls

Outrigger walls have been positioned at regular intervals throughout the height of the building. These walls link from floor-to-floor over 4 levels and behave as rigid arms, transmitting forces between the central core and exterior perimeter Mega-Columns when subjected to lateral loading.

4.2.3 Mega-Columns

Mega-Columns form part of the lateral stability system and are designed to support both gravity loading and transient wind lateral loading transmitted from the outrigger walls. Refer to Figure 4.2.1 for Mega-Column locations and below for preliminary sizes:

- 3000mm long by 1200 mm wide, Grade N80 Concrete, from Base to L19;
- 3000mm long by 1000 mm wide, Grade N65 Concrete, from L20 to L41; and
- 3000mm long by 800 mm wide, Grade N50 Concrete, from L42 to Top.

4.3 TYPICAL TOWER FLOOR FRAMING

The typical floors will be of Post-Tensioned Flat Plate construction. Maximum spans and cantilevers of up to 10m and 2-3m respectively are achieved, which allows floor plates of, generally, 200mm thick and 220mm thick with wet area set-downs. Non typical floors such as plant, lobby, restaurant, lounge, BOH are 250mm Flat Plates due to increased loading requirements.

Additionally, at any floor where the column centreline changes slope (i.e where ‘stepping ‘of a column starts or ends), the required slab thickness is 250 mm to account for the induced horizontal thrust into the floor (assuming a maximum sloping angle of 10 to 15 degrees). Therefore, to reduce the number of non-typical slabs, it is recommended that all columns that change slope do so at the same levels.

4.4 PODIUM FLOOR FRAMING

Podium levels are generally banded Post-Tensioned slabs comprising slabs 180 to 250mm thick and beams 350 to 500mm thick.

4.5 GRAVITY COLUMNS

During the second Phase of the design competition, WSP worked with FJMT to develop a column strategy that could achieve the architectural intent of a sloping, twisting building but at the same time adhere to the key design criteria of vertical continuity and minimal/no transfer structure. The criteria is aimed at maximising buildability and keeping programme and costs to a minimum. This has been achieved through the use of blade columns that ‘step ‘gradually along their longer axis. There are to be no steps along the column shorter axes. The ‘stepped’ column concept has been subject to co-ordination with the apartment layouts and will undergo further design development as the architecture and interior design matures.

4.5.1 Column Sizes

Gravity column sizes are shown in Table 4.5.1 (key plan in Figure 4.5.1). To simplify construction and improve buildability, the change in column sizing (and concrete grade) has been kept to a minimum and generally aligns with changes in core wall thicknesses.

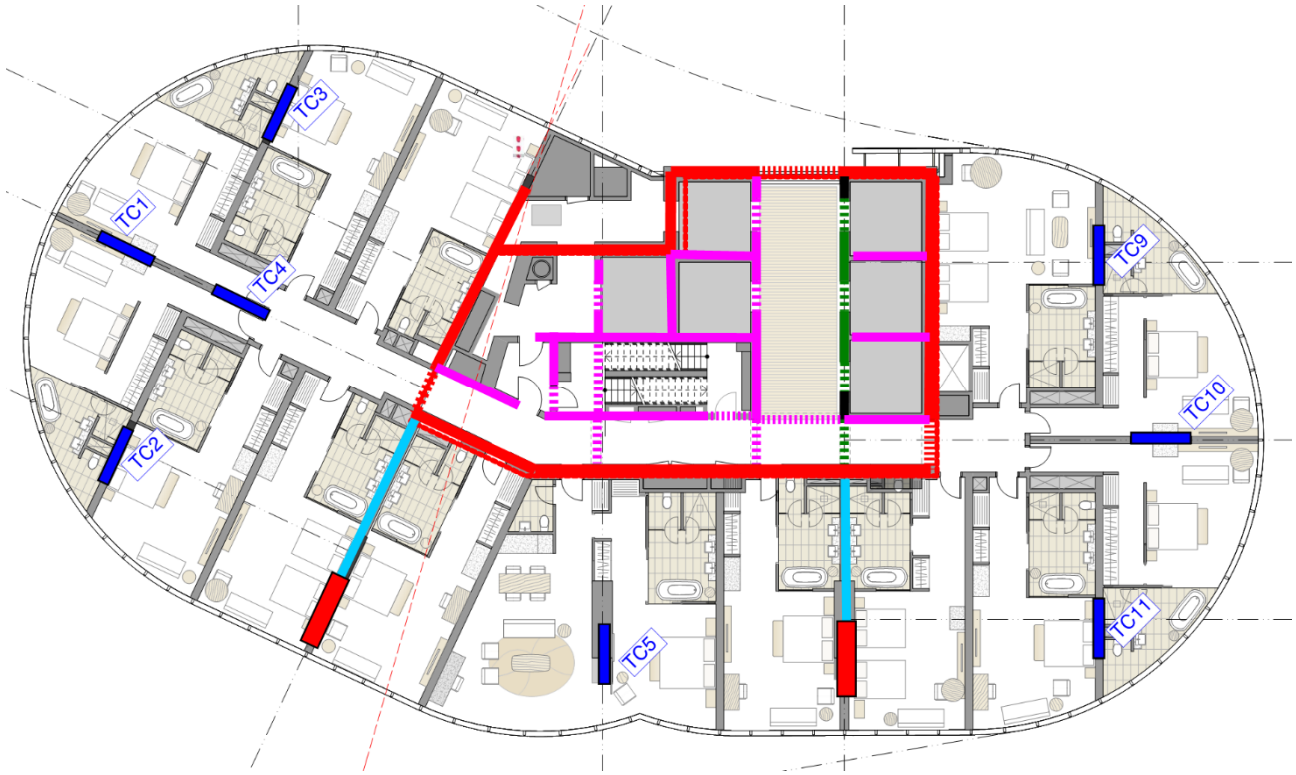

FIGURE 4.5.1 COLUMN KEY PLAN

Mark	Base to Level 19 (N80 Concrete)	Level 20 to Level 41 (N65 Concrete)	Level 42 to Top (N40 Concrete)
TC1	-	1100 SQ or 2400x500	800SQ or 2000x300
TC2	1200SQ or 2800x500	1200 SQ or 2400x500	900SQ or 2400x300
TC3	TBA	1100 SQ or 2400x500	900SQ or 2400x300
TC4	5400x600 or 4200x80	1300SQ or 2500x60	900SQ or 2000x400
TC5	1300SQ or 2800x600	1300SQ or 2800x600	1000SQ or 3000x300
TC6	1000SQ or 1800x500	1000SQ or 1800x500	700SQ or 1800x300
TC9	1100SQ or 2800x500	1100SQ or 2200x500	800SQ or 2000x300
TC10, TC11	1200SQ or 2800x600	1200SQ or 2200x600	900SQ or 2400x300

TABLE 4.5.1 GRAVITY COLUMN SIZES

4.5.2 Column Steps

As outlined in section 4.3, 'stepping' of columns induces a horizontal thrust into the floor at every change of slope. To minimize cost and structure required, we propose the following:

- If multiple columns are required to slope, they should do so over the same levels;
- Columns slope at a constant angle, of maximum 10 to 15 degrees. The shallower the angle, the smaller the horizontal forces. As such, sloping the columns over more floors are more beneficial; and
- Columns slope in one direction only.

4.5.3 Column Transitions

Column transitions denote any change in column size, shape and/or orientation of the column on plan between two stories. We propose the following:

- Minimal transitions;
- At transitions, provide at least 70% overlap of column cross-sectional area. Otherwise, column capitals will be needed to transition the loads, the thickness of which will depend on the column loading, concrete grade and available cross-sectional area overlap; and
- For blade columns, avoid significant changes in orientation on plan, as this will require column capitals.

4.5.4 Transfers

There is no column transfer required in the current design. Column transfers should be avoided as they introduce complexities to the construction programme and often require deep transfer structure to accommodate which result in significant costs.

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INTERFACE WITH EXISTING STRUCTURE

5 INTERFACE WITH EXISTING BUILDING STRUCTURE

To suit room planning and floor efficiency it is necessary for the tower core to be located adjacent to an existing goods lift which is required to remain operational during construction. Design development is currently being undertaken to co-ordinate the existing and new structures and to present a conventionally buildable solution.

The proposal for the new tower podium / existing podium interface is to create a permanent movement joint between the two structures. The size and exact location of the joint will be investigated in more detail at the next stage.

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STRUCTURAL DESIGN STANDARDS

6 STRUCTURAL DESIGN STANDARDS

Typically, the structural engineering design of the building is covered by Australian Standards.

The list of standards provided below is not exhaustive and represents key design standards commonly used for building design.

Structures	Australian Standard
Structural Design Actions – General Principles	AS/NZS 1170.0 - 2002
Structural Design Actions – Permanent, Imposed and Other Actions	AS/NZS 1170.1 - 2002
Structural Design Actions – Wind Actions	AS/NZS 1170.2 - 2011
Structural Design Actions – Earthquake Actions in Australia	AS/NZS 1170.4 - 2007
Piling Design and Installation	AS 2159 – 2009
Concrete Structures	AS 3600 - 2009
Masonry Standards	AS 3700 – 2001
Steel Structures	AS 4100 – 1998
Steel Reinforcing Materials	AS 4671.1 – 2001
Earth Retaining Structures	AS 4678 – 2002
Evaluation of Human Exposure to Whole Body Vibration – Continuous and Induced Vibration in Buildings	AS 2670.2 – 1990

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STRUCTURAL DESIGN DEAD AND LIVE LOADS

7 STRUCTURAL DESIGN DEAD AND LIVE LOADS

Floor Loads (kPa UNO)	SDL	LL
Hotel	1.3	2.0
Residential (Balcony)	1.3	1.5 (2.0)
Public Areas	2.5	5.0
Carpark	0.5	2.5
Retail	As applicable	5.0
Storage	As applicable	2.4kPa x height
Truck Loading Dock	0	12
Plant Areas	2.5	5
Façade	0.6kPa x height	

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WIND AND EARTHQUAKE LOADING

8 WIND AND EARTHQUAKE LOADING

8.1 WIND LOAD

Preliminary wind loading will be calculated in accordance with AS1170.2 based on the following factors:

Wind Load	
Wind Region	A2
Approach Terrain Category	3
Ultimate Wind	1 in 1000
Ultimate Wind Speed	46 m/s
Serviceability Wind	1 in 20
Regional Wind Speed (serviceability)	37 m/s
Terrain Height Multiplier, Mz, cat	Refer AS1170.2
Damping Ratio (ultimate)	3.0% of critical damping (T.B.C.)
Damping Ratio (serviceability)	1.0% of critical damping (T.B.C.)
*Final wind loading will be based on the results of wind tunnel testing, which will be undertaken once the main lateral elements have been frozen.	

8.2 EARTHQUAKE LOAD

The structure will be designed in accordance with AS1170.4 for the following seismic criteria:

Earthquake Load	**Seismic Criteria**
Hazard Factor Z	0.08
Site Sub-Spoil Class	Be
Importance Factor	3
Design Working Life	50 years
Earthquake Design Category	III
Earthquake Loading Return Period	1 in 1000
Probability Factor Kp	1.3

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STRUCTURAL DEFLECTION / VIBRATION LIMITS

9 STRUCTURAL DEFLECTION / VIBRATION LIMITS

Criteria	Span to Depth Ratio	Maximum Deflection
Incremental Floor Deflection	Span/500	Or maximum of 20mm
Long Term Floor Deflection	Span/250	Or maximum of 25mm
Incremental Floor Deflection for Transfers	Span/1000	Or maximum of 10mm
Differential Floor to Floor Deflection (Façade)	Span/500	20mm subject to further coordination with Façade Consultant
Floor Vibration Criteria		a < 0.5%g
Building Lateral Acceleration Limits	Covered by Wind Tunnel Test Report, Melbourne & Cheung Criterial / ISO 104137 (2	

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