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The Store Residential **Towers**

Transportation Services Concept Report

for

Doma Group

Revision B | 31st May 2022

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Revision	Date	Description	Author	Reviewer
P1	26/10/20	Concept Report	RS	BI
A	06/07/21	Updated Report based on revised concept	RS	LV
B	31/05/22	Updated Report based on revised DA Concept	RS	BI

1. INTRODUCTION

1.1 Aim of Report

This report examines the design basis of the lift services for The Store East and West Residential Towers as well as the commercial office component at the bottom. This report is an update from the original report issued in July 2021 and it covers the revised concept drawings provided by Bates Smart.

1.2 Applicable Documents

+ National Construction Code
+ Relevant Australian Standards

1.3 Sources of Information

+ Updated Council RFI DA drawings from Bates Smart (Issued 13th April 2022)

2. BASIS OF DESIGN

2.1 Building Parameters

The project comprises the following building parameters:

	West Tower – Base Option		East Tower – Base Option
Level 30	N/A	Level 30	Communal Terrace
Level 29	N/A	Level 29	2 Apartments
Level 28	Communal Terrace	Level 28	4 Apartments
Level 27	3 Apartments	Level 27	5 Apartments
Level 26	5 Apartments	Level 26	6 Apartments
Level 25	5 Apartments	Level 25	6 Apartments
Level 24	6 Apartments	Level 24	7 Apartments
Level 23	7 Apartments	Level 23	7 Apartments per level
Level 19 to 22	8 Apartments per level	Level 16 to 22	7 Apartments per level
Level 6 to 18	9 Apartments per level	Level 6 to 15	8 Apartments per level
Level 5 Mezzanine	Residential Storage	Level 5 Mezzanine	Residential Storage
Level 5	6 Apartments / Recreation Deck/Car Park access	Level 5	5 Apartments / Recreation Deck/Car Park access
Level 4	Residential Storage / Plant	Level 4	Residential Storage / Plant
Level 3	Residential Communal Space – 1219m^2 of NLA		
Level 2	Commercial office – 1070 m^2 of GFA		
Level 1	Commercial office – 966 m^2 of GFA		
Ground	Main Lobby / Retail		Main Lobby / Retail

The office space on Levels 1 and 2, now span across the footprint occupied by both the East and West residential towers. There is an open stair connection linking all the commercial office floors to the Ground floor. It is expected that people will use both the stairs and the lift to move vertically within this zone.

2.2 Design Criteria

This section covers the recommended performance criteria for a typical 5-minute peak period movement within both the residential and commercial zones. The peak period movement for the residential zone is based on a 2-way movement of people that would typically occur during the early evening. Some people would be returning from their daily activities and others would be going out for evening activities.

The peak period movement for the commercial office component will be assessed for the morning Up Peak (when people are arriving) and during the lunch 2-way peak (when people are going out to eat or coming back from lunch).

The design criteria noted in the table below is based on international and local norms as well as S4B's internal good practice guidelines.

	Residential Towers (2 Way movement)	Commercial Office
Handling Capacity	7 – 8% of the population	13% of population in morning peak 11% of population in lunch peak
Average Waiting Time	30 – 50 seconds	30 seconds in morning 40 seconds at lunch
Access Levels	Ground floor and Level 5 Recreation Deck	Ground Floor

The total population of the building has been determined based on the following assumptions:

Occupancy (1 bed and studio apartments)	2 people per 1 bedroom or studio apartment
Occupancy (2 bed apartments)	3 people per 2 bedroom apartment
Occupancy (3 & 4 bed apartments)	4 people per 3 or 4 bedroom apartment

Due to the small size of the commercial office component the Property Council of Australia Office Building Guidelines, are not applicable. The lift for the commercial office component will be sized to satisfy the technical requirements outlined in the NCC.

The commercial office population has been determined using a population density of 1 person per 12m^2 of Net Lettable Area.

3. TRAFFIC ANALYSIS

3.1 East Tower

In the previous scheme, there was a commercial office component spanning across both the East and West tower footprint. This now happens only on Levels 1 and 2. There will still be transfer level at Level 5 that will connect the tower to the recreational deck and the residential car park. There is now a communal space spanning across the footprint of both towers on Level 3. There will be storage space and a refuse collection point on Level 4. In addition to the previous scheme, there is now storage space on a Level 5 Mezzanine level.

The lifting scheme of the East Tower remains unchanged with 3 lifts serving all residential floors and Ground. These lifts are sized to allow for passenger movement as well as furniture, plant, and stretcher movement.

	Triplex Lift Configuration
Control System	Conventional Control
Levels Served	G, 3- 30
Number of Lifts	3
Two Way Handling capacity	8% in 5 minutes
Average Waiting Time	45 seconds
Lift Capacity	18 Persons / 1350 Kg
Lift Speed	2.5m/s

Comments

+ The proposed lift configuration will provide a good level of service.
+ The lifts will comply with the National Construction Code requirements for emergency lifts.
+ A Machine room less (MRL) solution is proposed for this tower.

3.2 West Tower

In the previous scheme, The West Tower contained commercial and residential components. There will still be transfer level at Level 5 that will connect the tower to the recreational deck and the residential car park. There is now a communal space spanning across the footprint of both towers on Level 3. There will be storage space and a refuse collection point on Level 4. In addition to the previous scheme, there is now storage space on a Level 5 Mezzanine level

The lifting configuration remains unchanged for this tower with 3 lifts serving all residential floors. These lifts will be sized to allow for passenger movement as well as furniture, plant, and stretcher movement. Separate provisions exist for the commercial office floors.

	Residential
Control System	Conventional Control
Levels Served	G, 3 – 28
Number of Lifts	3
Peak Period Handling capacity	8% in 5 minutes 2 Way Peak
Average Waiting Time	41 seconds
Lift Capacity	18 Persons / 1350Kg
Lift Speed	2.5m/s

Comments

- The proposed lift configuration will provide a good level of service.
- The lifts will comply with the National Construction Code requirements for emergency lifts.
- A Machine room less (MRL) solution is proposed for this tower.

3.3 Commercial Office

The commercial office component common across both the East and West tower now only occurs on Levels 1 and 2. A separate analysis has been undertaken for this zone.

A single passenger lift currently serves Ground and the 3 office floors above. There is an open stair connection between all levels. The lift and stairs are located within the West tower footprint. There is also a Goods lift that serves the commercial office floor levels and Level 4. It appears that this lift will also be used to move residential tower refuse.

	Commercial Office (1 Lift)	
	Morning Peak	Lunch Peak
Control System	Conventional Control	
Levels Served	G, 1 – 2	
Peak Period Handling capacity	13% in 5-minute Up Peak	11% in 5-minute Lunch Peak
Average Waiting Time	18 seconds	23 seconds
Lift Capacity	21 Persons / 1600Kg	
Lift Speed	1.0 m/s	

Comments

- A Single Passenger lift and open stair access will be able to provide an adequate level of service. It is assumed and expected
- that people will use both options when moving between office floors.
- The lifts will comply with the National Construction Code requirements for emergency lifts.
- A Machine room less (MRL) solution is proposed for this tower.
- There may be an issue using the Goods lift for the office and to move residential refuse. On the office levels, the Goods lift should have its own lobby and not open directly onto the office floor.
- The Goods lift could be used as a backup to the main office passenger lift.

4. GENERAL COMMENTS

For the commercial office floors, the open stair provision is important to the efficient movement of people. S4B's analysis has been based on people using stairs as well as lifts to travel between levels. With the larger commercial floor area, if people only used the lift to travel between floors, there maybe periods where extended waiting times are experienced. The open stairs will provide a viable alternative for people travelling between levels and mitigate this risk, especially when it is to a level directly below or above them.

For both residential towers, there will be an express zone through the commercial office floors. As the travel distance between Level 4 and Ground is greater than 12 metres, an emergency access opening will be required into both the East and West residential lift shafts at Level 2. This access would only be required for rescue if a residential lift is stuck within the express zone.

The noise level in the lift shaft will be in the order of 75db(a). Acoustic treatment may be required for apartments adjacent to the lift core. Noise could also propagate through the lift lobbies, so apartments within close proximity to the lift entrances may also be impacted.

The lobby width should allow movement for furniture potentially up to 2,400mm in length, into and out of the lifts. A stretcher with dimensions 2,000mm long x 600mm wide x 1,400mm high should also be able to be moved in and out of the lifts at all levels.

The size of the Goods / Refuse lift may need to be refined once we better understand the intended use of the lift. As this lift is shared between commercial and residential components, the following risks need to be considered:

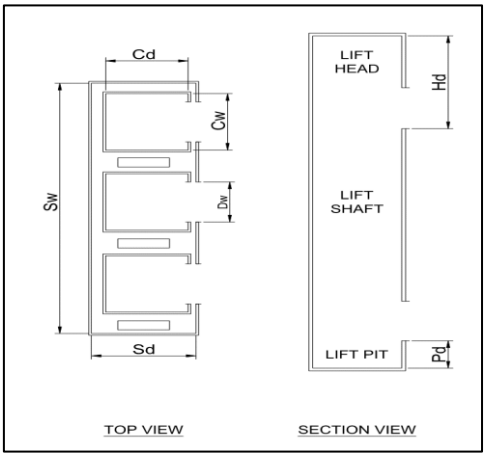
- Wear and tear on the lift
- Damage to or foul odours within the lift
- Security of Goods lift opening directly onto office space.
- Access to Goods lift in a multi-tenant scenario.
- Sharing maintenance and operating costs.

The Goods / refuse lift could be used to provide redundancy for the commercial office passenger lift. However, its current location may make it difficult to be used as an adequate backup to the passenger lift if it is every out of service for a prolonged period.

4.1 Lift Type

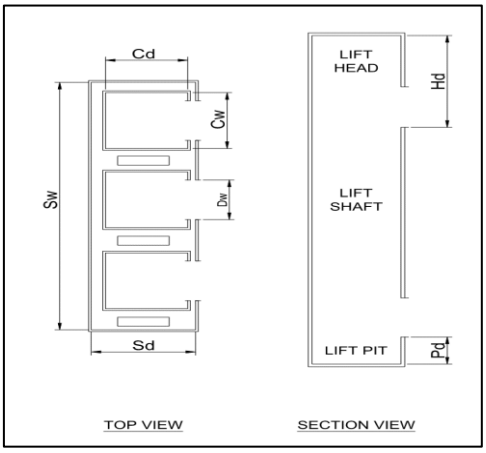
The lifts will be gearless machine room less lifts. There will be no requirement for a machine room as the main control modules and machines are located within the lift shaft at the top. A maintenance control panel for each lift will be required adjacent to the landing doors on the highest level served.

4.2 Lift Layout – East Tower Residential Lifts



Group	LIFT CAR DIMENSIONS					INTERNAL SHAFT DIMENSIONS			
	Door Width (Dw)	Car Door Height	Car Width (Cw)	Car Depth (Cd)	Internal Car Height	Shaft Width (Sw)	Shaft Depth (Sd)	Headroom (Hd)	Pit Depth (Pd)
Triplex (3)	1,000mm / 1,100mm	2,300mm	1,450mm	2,000mm	2,500mm	7,300mm including trimmer beam	2,750mm	4,700mm	2,400mm

4.3 Lift Layout – West Tower Residential Lifts



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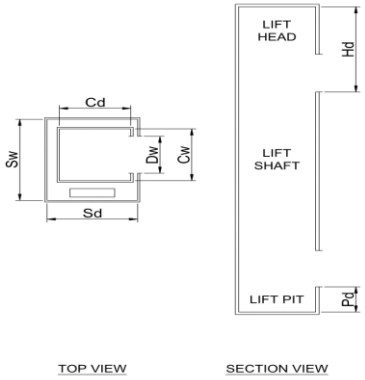
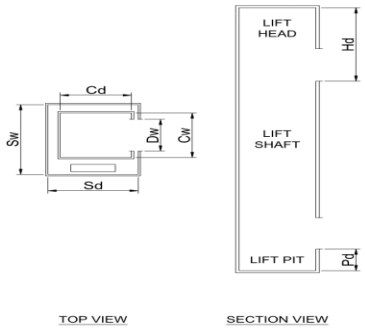
Triplex (3)	1,000mm / 1,100mm	2,300mm	1,450mm	2,000mm	2,500mm	7,300mm including trimmer beam	2,750mm	4,700mm	2,400mm

4.4 Lift Layout – Goods / Refuse Lift



Group	LIFT CAR DIMENSIONS					INTERNAL SHAFT DIMENSIONS			
	Door Width (Dw)	Car Door Height	Car Width (Cw)	Car Depth (Cd)	Internal Car Height	Shaft Width (Sw)	Shaft Depth (Sd)	Headroom (Hd)	Pit Depth (Pd)
Single	1,300	2,500mm	1,600mm	2,400mm	2,700mm	2,850mm	3,050mm	4,400mm	1,600mm

4.5 Lift Layout – Commercial Lift



Group	LIFT CAR DIMENSIONS					INTERNAL SHAFT DIMENSIONS			
	Door Width (Dw)	Car Door Height	Car Width (Cw)	Car Depth (Cd)	Internal Car Height	Shaft Width (Sw)	Shaft Depth (Sd)	Headroom (Hd)	Pit Depth (Pd)
Single	1,000	2,200mm	1,650mm	2,000mm	2,400mm	2,500mm	2,450mm	4,400mm	1,600mm

4.6 Notes for all Lift Configurations

+ The dimensions provided above are internal clear plumb, as such construction tolerances and the shaft structure should be considered.
+ It is assumed all pits are to solid earth.
+ Deep pits may require the provision of stairs outside the lift shaft, that lead down to the pit floor to allow direct access onto the pit floor.
+ The residential lifts are assumed to be dual entry. The Office and Goods lifts are assumed to be single entry.