

711 Hunter Street, Newcastle

Vertical Transportation Services DA Performance Report

for
St Hilliers



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1. INTRODUCTION

1.1 Aim of Report

This report reviews the performance of the Vertical Transportation Services for Stage 1 and 2 apartment buildings at 711 Hunter Street, Newcastle West.

1.2 Applicable Documents

- + National Construction Code.
- + NSW Apartment Design Guide.
- + ISO 8100 – 32 Lifts for the transportation of persons and goods – Part 32 Planning and selection of passenger lifts to be installed in office, hotel and residential buildings.
- + CIBSE Guide D Transportation systems in buildings.
- + Relevant Australian Standards applicable to lifts.

1.3 Objective

The vertical transportation design for the site is to be fit for purpose, efficient and meet recommended design criteria. This report aims to provide clarity for the number of lifts proposed to have the capacity to reasonably service the number of floors and apartments.

1.4 Limitations

This report represents S4B's opinion on the most suitable configuration to achieve the benchmark levels of performance. It does not imply or intend to provide warranties or guarantees of performance or be a design/tender document.

S4B has relied on the accuracy of the architectural information to determine floor levels and residential populations. We cannot accept responsibility or liability for any inaccuracies attributed to the drawings.

1.5 Sources of Information

- + Amended DA drawings from Plus Architecture Pty Ltd
- + Initial Vertical Transport Analysis dated June 2022 by Safralou Pty Ltd

2. BASIS OF DESIGN

2.1 Design Criteria

The following is the recommended population criteria for residential buildings as detailed in ISO 8100 and the CIBSE Guide:

2.1.1 Basis for determining population.

Type	Prestige	Standard	Basic
Occupancy (1 bed apartments)	1.5 people per bedroom	1.8 people per bedroom	2.0 people per bedroom
Occupancy (2 bed apartments)	2.0 people per bedroom	3.0 people per bedroom	4.0 people per bedroom
Occupancy (3 bed apartments)	3.0 people per bedroom	4.0 people per bedroom	6.0 people per bedroom
Traffic Mode	Two way 50% incoming, 50% outgoing	Two way 50% incoming, 50% outgoing	Two way 50% incoming, 50% outgoing

The following is the performance criteria for residential buildings as detailed in the CIBSE Guide, ISO 8100 and the NSW Apartment Design Guide (ADG).

2.1.2 CIBSE Residential Performance Design Criteria

	Prestige	Standard	Basic
Average waiting time	45-50 seconds	50-60 seconds	50-70 seconds
5 minute handling capacity	8%	6-8%	5-7%

2.1.3 ISO 8100 Residential Performance Design Criteria

Average waiting time	60 seconds
5 minute handling capacity	7%

2.1.4 Apartment Design Guide Design Criteria

Number of Lifts For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40.



2.2 Recommended Design Criteria

We recommend the design criteria detailed in ISO 8100 and the CIBSE guide be considered for the most appropriate for 711 Hunter Street.

The Apartment Design Guide is an estimate or rule of thumb and would vary dependant on the number of bedrooms and apartments per floor. Guidelines should not be used where calculations or simulations can be carried out to provide a predicted traffic analysis of the lifts and building performance.

Our recommended performance criteria is:

Average waiting time	60 seconds
5 minute handling capacity	7%

The recommended design criteria has been the basis of design for similar apartment projects carried out by S4B both in Newcastle and Sydney.

3. TRAFFIC ANALYSIS

3.1 Apartment Schedule

There are Two (2) residential towers on the site, Stage 1 and Stage 2.

Levels	1 Bed	2 Bed	3 Bed	4 Bed	Aparts	Pop	1 Bed	2 Bed	3 Bed	Aparts	Pop
	Stage 1						Stage 2				
Level 25			2	1	3	13	1	3	1	5	15
Level 24		2	3		5	18	1	3	1	5	15
Level 23		2	3		5	18	1	3	1	5	15
Level 22		2	3		5	18	1	3	1	5	15
Level 21		2	3		5	18	1	3	1	5	15
Level 20		2	3		5	18	1	3	1	5	15
Level 19		2	3		5	18	1	3	1	5	15
Level 18		2	3		5	18	1	3	1	5	15
Level 17	2	4			6	16	1	3	1	5	15
Level 16	3	5			8	20	1	3	1	5	15
Level 15	3	5			8	20	1	3	1	5	15
Level 14	3	5			8	20	1	3	1	5	15
Level 13	3	5			8	20	2	4		6	16
Level 12	3	5			8	20	2	4		6	16
Level 11	3	5			8	20	2	4		6	16
Level 10	3	5			8	20	2	4		6	16
Level 9	3	5			8	20	2	4		6	16
Level 8	3	5			8	20	2	4		6	16
Level 7	3	5			8	20	2	4		6	16
Level 6	3	5			8	20	2	4		6	16
Level 5		1	3		4	15	2	3		5	13
Level 4								1	1	2	7
Level 3							2	1		3	5
Level 2							2	1		3	5
Level 1							2	1		3	5
Ground											
Totals	35	74	26	1	136	394	36	75	13	124	336

Figure 1 Residential Apartment Schedule

S4B's approach for all the residential towers has been to provide a lift configuration where all lifts are capable of transporting people and household furniture commensurate with the quality of the development. The lift speeds and sizes have been selected to allow for a machine room less (MRL) solutions for all towers.

S4B has made the following assumptions when running our lift simulations:

- + Use of Conventional Control systems for lifts in both stages.
- + It has been assumed that the greatest peak period would likely be a weekday evening where some people are returning from their day's activities and others are leaving for external activities.
- + The traffic pattern will be made up of 50% of the population arriving at the building via the main entry level or any of the carparking levels and the other 50% leaving the building via the main entry level or any of the carparking levels.



- + Entry / Exit biases for car parking levels based on the number of car spaces on each level. Studies include for 80% entry/exit at Ground floor during peak times and 20% entry/exit at car park levels during peak times.
- + All lifts will be capable of moving people as well as standard household furniture.

3.2 Predicted Performance

Based on commercially available lift solutions the following lift configuration would be best suited for satisfying good practice performance benchmarks.

Stage 1

The architectural drawings detail three (3) lifts serving all levels.

	Three Lifts	Two Lifts
Study	Two Way	Two Way
Condition	All lifts in service	One lift out of service
Levels Served	G, 1 to 25	G, 1 to 25
Apartments	136	136
Number of Lifts	3	2
Handling capacity	7% in 5 minutes	7% in 5 minutes
Average waiting time	27 seconds	57 seconds
Lift Capacity	18 Persons	18 Persons
Lift Speed	2.50 mps	2.50 mps
Lift Type	MRL	MRL

Simulations were completed for the range of 6% to 8% handling capacity providing waiting times ranging from 22 to 31 seconds for 3 lifts.

Stage 2

The architectural drawings detail two (2) lifts serving all levels.

	Two Lifts	One Lift
Study	Two Way	Two Way
Condition	All lifts in service	One lift out of service
Levels Served	G, 1 to 25	G, 1 to 25
Apartments	124	124
Number of Lifts	2	1
Handling capacity	7% in 5 minutes	7% in 5 minutes
Average waiting time	52 seconds	310 seconds
Lift Capacity	18 Persons	18 Persons
Lift Speed	2.50 mps	2.50 mps
Lift Type	MRL	MRL

Simulations were completed for the range of 6% to 8% handling capacity providing waiting times ranging from 43 to 60 seconds for 2 lifts.

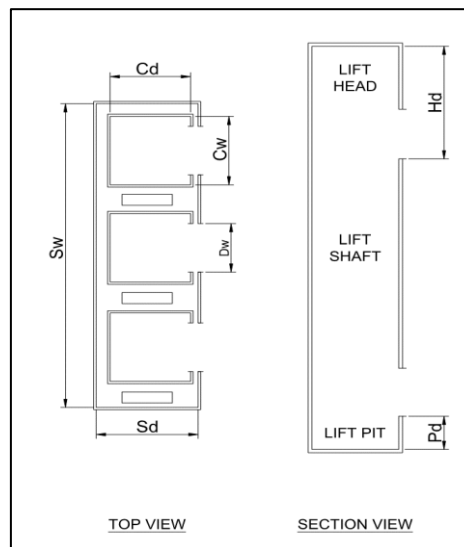
4. CONCLUSION

The numbers of lifts within each tower, currently shown on the architectural layouts are suitable for achieving the desired performance criteria and confirm the lifts have the capacity to reasonably service the number of floors and apartments. The modelling demonstrates that general waiting times are acceptable and there will be no unreasonable impact when residents are moving in or out when properly managed. These align with other similar types of developments within Newcastle, Sydney and throughout NSW.

Machine room less (MRL) solutions are available for both towers.

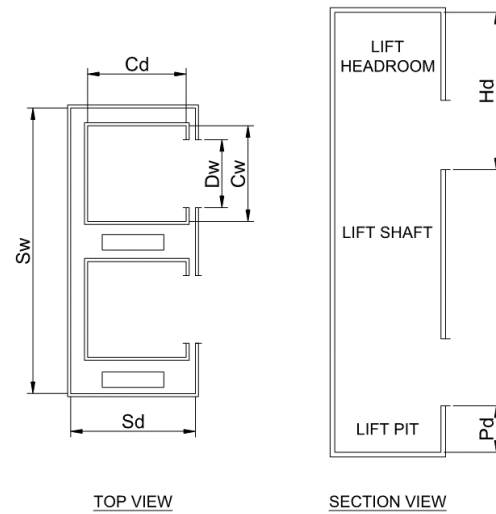
4.1 Dimensional Information

Stage 1



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	2,100mm	1,500mm	2,000mm	2,400mm	7,800mm	2,600mm	5,200mm	2,200mm

Stage 2



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)
Duplex (2)	1,000mm	2,100mm	1,500mm	2,000mm	2,400mm	5,150mm	2,600mm	5,200mm	2,200mm

Notes relevant to all lift configurations.

- + The shaft dimensions detailed are scaled from the architectural drawings and require confirmation.
- + The shaft dimensions could be reduced with the car dimensions detailed in above
- + The dimensions provided above are internal clear plumb, as such construction tolerances and the shaft structure should be considered.
- + It is assumed that lifts will be standard lifts built in normal enclosed shafts. If scenic (glass) lifts or a glass shaft structure is desired, lift car and shaft dimensions will change.
- + It is assumed all pits are to solid earth.