LIFT SERVICES DESIGN BRIEF
16.4946

2 FIGTREE DRIVE
SYDNEY OLYMPIC PARK

DEVELOPMENT APPLICATION

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Development Application Issue
21st November 2016

DOCUMENT AUTHORISATION

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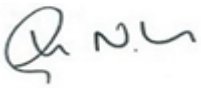
Approved by: Glenn Nelson (Senior Lift Engineer)	 Signed:_____	Date: 21/11/2016

REVISION STATUS

Rev No.	Description of Revision	Date	Approved
P1	Cost Plan A	21/06/2016	
P2	Cost Plan B	8/09/2016	
P3	Development Application	20/09/2016	
P4	Development Application	21/11/2016	

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PASSENGER LIFT SERVICES

1.1 GENERAL

The lift services for the proposed SOP 53 (new scheme) residential development located at, 2 Figtree Drive, Sydney Olympic Park will be designed to provide a level of service in line with a good quality residential apartment complex and to meet the intent of the project's ADG requirements, together with serving the end user's particular needs with regard to:

- Availability
- Reliability
- Passenger comfort
- Accessibility
- Energy Efficiency

1.2 PROJECT DESCRIPTION

The development comprises a multi-level residential complex up to 31 levels in height that includes four residential apartment blocks with car parking facilities for residents and visitors.

1.3 PERFORMANCE BENCHMARK

In determining the required lift performance for each block the expected level of performance would be considered as needing to be in line with a good quality residential apartment development.

In order for the level of lift service to meet the good quality expectation each block's lift design has been based on the Chartered Institute of Building Services Engineers (CIBSE) guidelines, which requires a lift system to achieve an average lift waiting time during two-way lift traffic of 30 - 60 seconds during any worst 5minute period measured over a 1 hour simulation time frame, whilst at the same time transporting 6% of the building's potential population during the 5minute period.

The following table outlines the range of CIBSE guidelines for residential lift applications and in this instance the good quality rating has been deemed as the appropriate targeted criteria:

Good quality	
Handling Capacity	6 %
Average Waiting Time	40 – 60 seconds

Yield Information

It is advised that the lift traffic analysis undertaken is based on the following population yield information as current at the date of this report.

Building	**Block 1**	**Block 2**	**Block 3**	**Block 4**
Levels Served	12 Levels	31 Levels	9 Levels	23 Levels
Apartment Yield	69	296	65	264
TOTAL	694 apartments			

1.4 NUMBER OF LIFTS, CAPACITIES & SPEEDS

It has been determined from the lift traffic analysis and assessment of the ADG requirements that the following lift design (lift numbers, capacity and speed) for each block would be required to provide a level of lift service in accordance with benchmark average waiting intervals and 5minute handling capacity.

Lift Details	**Block 1**	**Block 2**	**Block 3**	**Block 4**
Number of lifts & Levels Served	2 lifts B5-B1, 1 - 12	1 low rise B5-B1, 1-15 1 low rise B5-B2, 1-15 2 high rise B4-B2, 16 - 31	2 lifts B5-B1, 1 - 9	2 high rise lifts B5-B1, 1 - 23 1 low rise lift B5-B1, 1 - 10
Lift Speed	1.75 m/s	Low Rise 2.5 m/s	1.75 m/s	High Rise 3.0 m/s
		High Rise 4.0 m/s		Low rise 1.75 m/s
Lift Car Capacity	1275kg – 17 persons	1600kg – 21 persons L/R 1350kg – 18 persons H/R	1275kg -17 persons	1275kg – 17 persons
Population based on 1.5 persons/ bedroom	178 residents	844 residents	155 residents	548 residents

1.5 LIFT PERFORMANCE POTENTIAL

The traffic analysis results disclosed that each block's lift system would have the potential to achieve the following levels of performance:

Block 1 – 2 lifts @ 6% handling Capacity – Potential Population 178 persons

Target Criteria	**Performance Potential**
CIBSE guideline target - Average Waiting Time 40 – 60 seconds	
Worst 5minute period	15 seconds
Average over the 1 hour period	13 seconds
Persons transported over1 hour period	128 persons/hour
Quality of Service Expectation	Good
CIBSE Guideline Target	achieved

Block 2– 2 low rise & 2 high rise lifts @ 6% handling capacity

Target Criteria	**Performance Potential**
CIBSE guideline target - Average Waiting Time 40 – 60 seconds	
Low Rise Lifts – Potential population 414 persons	
Average during worst 5minute period	37.0 seconds
Average over the 1 hour period	32.0 seconds
Persons transported over 1 hour period	298 persons/hour
High Rise Lifts – Potential population 430 persons	
Average during worst 5minute period	55.0 seconds
Average over the 1 hour period	49.0 seconds
Persons transported over1 hour period	310 persons/hour
Quality of Service Expectation	Good
CIBSE Guideline Target	achieved

Block 3 –2 lifts @ 6% handling capacity – Potential Population 155 persons

Target Criteria	**Performance Potential**
CIBSE guideline target - Average Waiting Time 40 – 60 seconds	
Average during worst 5minute period	13 seconds
Average over the 1 hour period	10 seconds
Persons transported over1 hour period	112 persons/hour
Quality of Service Expectation	Good
CIBSE Guideline Target	achieved

Block 4 – 2 High Rise lifts & 1 Low Rise lift @ 6% handling capacity

Target Criteria	**Performance Potential**
CIBSE guideline target - Average Waiting Time 40 – 60 seconds	
High Rise Lifts (1 & 2) – Potential population 419 persons	
Average during worst 5minute period	49.0 seconds
Average over the 1 hour period	40.0 seconds
Average over the 1 hour period	302 persons/hour
Low Rise Lift (No 3) – Potential population 129 persons	
Average for worst 5minute period	37 seconds
Average over the 1 hour period	28 seconds
Persons transported over1 hour period	93 persons/hour
Quality of Service Expectation	Good
CIBSE Guideline Target	achieved

Note: The lift traffic analysis for block 4, was made on the assumption that two thirds of the block's total potential population would use the high- rise lifts, whilst the remaining residents on levels 1 – 10, would use the low-rise lift.

1.6 REGULATORY FRAMEWORK (ADG REQUIREMENTS)

It is advised that the aforementioned benchmark criteria (CIBSE guidelines) is what is used both locally and internationally in determining lift designs in residential developments, however it is also a requirement of the development's regulatory framework that the lift design be compliant to ADG requirements (Objective 4F-1).

A condition of Objective 4F-1 is that 2 lifts shall be provided in buildings of 10 levels or more and an additional lift shall be included for every additional 40 apartments and it is advised that the intent of the requirement has been met in each building's lift design.

1.7 COMPARATIVE PROJECTS

To quantify the strategy for the project's lift services design, in particular the performance potential of the lifts in blocks 2 & 4, the following examples of similar quality residential developments located within the Sydney metropolitan area are provided as a comparison:

Block 2 – 299 apartments over 30 levels in height being served by 4 lifts

Apartment Complex	Number of Apartments	Residential Floors	Number of Lifts
Wentworth Point Building B	383	26	4
Wentworth Point Building C	420	27	4
Wentworth Point Building E	771	28	4

Block 4 – 160 apartments over 22/23 levels being served by the main core's 2 lifts

Apartment Complex	Number of Apartments	Residential Floors	Number of Lifts
48 Alfred Street North Sydney	109	24	2
50 Whaling Road North Sydney	Unknown	24	2
Avantra Mascot	165	14	2
Regatta Wharf Jacksons Landing	143	16	2

1.8 CONTROL & DRIVE EQUIPMENT

The controls and drives for the project's lift services will employ the latest product in lift control and drive systems, comprising of microprocessor controls and Variable Voltage Variable Frequency (VVVF) regenerative drives.

The design of the control and drive equipment will be capable of achieving +/- 5mm floor leveling accuracy under varying load conditions.

Building ID	Controls and Drives
Block 1	Two car duplex arrangement, with microprocessor controls and Variable Voltage Variable Frequency (VVVF) regenerative drive.
Block 2	
Low Rise	Two car duplex arrangement with microprocessor controls and Variable Voltage Variable Frequency (VVVF) regenerative drives.
High Rise	Two car duplex arrangement with microprocessor controls and Variable Voltage Variable Frequency (VVVF) regenerative drives.
Block 3	Two car duplex collective system, with microprocessor controls and Variable Voltage Variable Frequency (VVVF) regenerative drive.
Block 4	
High Rise Lifts	Two car duplex arrangement with microprocessor controls and Variable Voltage Variable Frequency (VVVF) regenerative drives
Low Rise Lift	Simplex collective system, with microprocessor controls and Variable Voltage Variable Frequency (VVVF) regenerative drive

1.9 SPATIAL INFORMATION

The following spatial information is provided as to what is required to accommodate each of the premises lift systems and it is advised the dimensions are the maximum required to accommodate all lift contractors' equipment and may vary slightly between each lift contractor.

***Lift Shaft Dimensions** – Based on each lift shaft extending to solid earth.*

Building ID	Lift Travel	Shaft Width Internal	Shaft Depth Internal	Top Overrun	Pit Depth
Block 1 - 2 lifts openings B5 –12	50.40m	4750mm	2500mm	4700mm	1600mm
Block 2					
2 High Rise lifts* openings B4 – B2, 1, 16 – 31	106.60m	5150mm	2600mm	6200mm	4200mm
2 Low Rise lifts openings B5 – 15	49.57m	5050mm	2500mm	5100mm	2200mm
Block 3 - 2 lifts openings B5 – 9	40.85m	4750mm	2500mm	4700mm	1600mm
Block 4					
High Rise – 2 lifts openings B5 – 23	85.15m	4750mm	2500mm	5400mm	2500mm
Low Rise 1 lift openings B5 – 10	43.90m	2300mm	2550mm	4700mm	1600mm

*******The 4.0m/s speed of the Block 2, high rise lifts will require a machine room located directly over the lift shafts. The machine room will require additional services and be provided with the dimensions as detailed below:*

Machine Room Dimensions		***Additional Services***
Internal height	2800mm	Circuit breaker panel
Front to back	4900mm	Lifting beams & access hatch
Width	6500mm	Lighting
		Air conditioning

***Lift Car Dimensions -** Based on single entry lift cars (excluding the Block 4 Podium through car lift) & Contractor's standard finishes (Note: custom finishes will reduce car width by approx. 50mm)*

Building ID	Car Width	Car Depth	Car Height*	Door Width	Door Height
Block 1					
Lifts 1 & 2	1400mm	2000mm	2700mm	1000mm	2100mm
Block 2					
Low Rise Lifts	1600mm	2000mm	2700mm	1000mm	2100mm
High Rise Lifts	1450mm	2000mm	2700mm	1000mm	2100mm
Block 3					
Lifts 1 & 2	1400mm	2000mm	2700mm	1000mm	2100mm
Block 4					
High Rise Lifts	1400mm	2000mm	2700mm	1000mm	2100mm
Low Rise Lift	1400mm	2000mm	2700mm	1000mm	2100mm

* have allowed for all lifts to have 2700mm internal height in order to accommodate the transportation of white goods and furnishings.

1.10 CAR FINISHES AND LOBBY APPOINTMENTS

Side and rear walls:	Good quality finishes to Architect's detail (in accordance with the respective contractor's lift car finishes weight allowance)
Ceiling:	To Architect's detail
Handrails:	Stainless steel handrails to each lift car in accordance with the design requirements of AS1735 Part 12 (access for persons with disabilities)
Car doors:	Linished stainless steel
Lift car front wall:	Linished stainless steel
Car operating panels:	One per lift – located in a selected sidewall of each lift car
Lift car protective blankets:	One set per lift
Lobby doors and frames:	Linished stainless steel doors and standard slim line door frames
Lobby buttons:	1 riser, located adjacent to or between each lift lobby entrance featuring linished stainless steel face plates selected from the lift contractor's product range
Lobby indicators:	Lift position indicators at each level inclusive of direction of travel indicators and adjustable volume two tone arrival chimes

1.11 ENERGY EFFICIENCY

The design of the lifts shall take into consideration energy saving design features such as:

- Variable Voltage Variable Frequency (VVVF) drives
- Lift car light controls shall be designed to enable the lights and car LCD screens to turn off once the controls have detected that a lift has not been in use for a period of 10 minutes
- Variable frequency AC permanent magnet motors
- Lift drives with regenerative energy capability

1.12 TRANSPORTATION OF FURNISHINGS & WHITE GOODS

To assist in the transportation of furnishings and white goods each lift will be provided with an internal ceiling height of 2700mm, this will be further complimented with each lift car having an internal depth (front to back) of 2000mm.

1.13 BCA REQUIREMENTS

- Lift lobby doors shall have a 1 hour fire rating.
- Stretcher facility will be provided in each lift to accommodate a horizontal stretcher.
- Facilities in each lift car and at each lift lobby will be provided for operation by disabled persons.
- The lifts will be contained within shafts having an FRL of not less than 120/120/120.
- Fire service controls will be provided in each lift car and at the main boarding floor of each lift core.
- Fire warning signage shall be provided at each lobby.

Note: Each block will be subject to the BCA requirements for buildings that have an effective height of more than 25 metres as such a minimum of 1 lift in each core will be provided with Fire Intercom systems or WIP.

1.14 FACILITIES FOR PERSONS WITH DISABILITIES

The lifts will comply with the requirements of the BCA, AS1735 Part 12 and AS1428, inclusive of the following facilities for persons with disabilities:

- Braille and Tactile information to control buttons
- Illuminating car communication buttons
- Handrail to dimensional and height requirements
- Voice annunciation provided within the lift cars
- Entrance protection device to the car door entrances
- Minimal internal car dimensions of 1400mm Wide x 2000mm Deep (stretcher compliant)
- Hands free self-dialing emergency phone to each lift car

1.15 COORDINATION OF SERVICES

The following services will need to be coordinated between the relevant engineering consultancies and architect during the design and documentation phase of the lift services, whilst particular trades' works associated with the lift services will form part of the lift documentation.

Architect	
Lift Car Finishes	Coordinate lift car internal finishes within the weight restrictions of the selected lift contractor's equipment
Lobby Door Frames	Coordinate door frame design (slim line or full depth)
Lift Control Cubicles	Coordinate location of lift control cubicles (top floor served or second top floor)
Electrical Engineering	
Sub-mains	Coordinate lift sub main requirements (labelling, loadings and point of connection)
CCTV	Coordinate lift car CCTV termination points
Fire Engineering	
Lift shaft smoke detectors, dry sprinklers & WIP	Coordinate smoke detector, sprinkler locations & WIP
Structural Engineering	Coordinate lift shaft reaction points and penetrations

Ref: MN/CF.4946