

Vertical Transportation Design Memorandum

ARUP

To Andy Chan (Lend Lease)

Date
13th May 2016

Copies Alex King (Lend Lease)

Reference number
DM -VT001

From Peter Tomlinson

File reference

Subject Vertical Transportation Design Statement
Darling Square – South East Plot

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Dear Andy

We are writing to confirm the vertical transportation design process for the passenger lifts in your Darling Square, South East Plot residential development.

While the performance of vertical transportation elements within commercial buildings is largely defined by the Property Council of Australia, there is no comparative advisory body for residential developments.

For the purpose of our traffic calculations we have referenced the performance criteria for residential buildings as discussed within the Chartered Institute of Building Services Engineer's – Transportation Systems in Buildings (CIBSE) Guide D. CIBSE Guide D is an internationally recognised document for defining the parameters of elevator equipment and performance outcomes when designing vertical transportation systems.

When conducting traffic analysis to determine system performance the following design assumption, for a "Normal" type residential type development have been used.

Target Performance Levels

Apartment Type	Luxury	Normal	Low Income
Interval (seconds)	45-50	50-60	60-70
Handling (% building population)	8%	6% to 8%	5% to 7%

Occupancy Ratio's

Apartment Type	Luxury	Normal	Low Income
Studio	1.0	1.5	2.0
1 Bedroom	1.5	1.8	2.0
2 Bedroom	2.0	3.0	4.0
3 Bedroom	3.0	4.0	6.0
Car Park	1 person / car with 50% churn during peak period		

Based on the above assumptions the following performance outcomes were achieved which align with a “normal” level of service.

Performance Outcomes	Darling Square – South East Tower 1
Number of lifts	3
Running speed	3.0 mps
Duty	3 x 1350kg / 18 passengers
Levels served	Grd (Main lobby), 1 through 36
Interval	60 seconds
Handling Capacity	6 %

With a handling capacity of 6% and waiting intervals of ≤ 60 seconds, the passenger lift system will provide tenants and visitors with a good, robust level of service consistent with other high end residential developments in the local and Sydney CBD areas.

We would also note that all lift cars sizes meet the DDA requirements of AS1725.12 & NCC.

It is our professional opinion that the provision of additional lifts, increasing the size or running speed of the lifts is unnecessary and will yield no benefit to the development.

Furthermore it is the intent of the Vertical Transportation specification that the equipment and installation shall conform to the requirements of all relevant codes and standards issued by recognised Codes, Standards and Legislative bodies, applicable for the location where the installation will take place, including but not limited to:

- AS 1735 - Lifts, Escalators and Moving Walks
- AS 1735.1 - General Requirements
- AS 1735.11 - Fire-rated landing doors
- AS 1735.12 - Facilities for persons with disabilities
- Building Code of Australia

I am an appropriately qualified and competent person in this area and as such can certify that the design complies with the above.

Full Name of Designer	Peter Tomlinson Associate Principal Vertical Transportation Leader – Australasia & Asia Pacific
Address of Designer	Level 10, 201 Kent Street, Sydney (Ph) 02 9320 9320 (Fax) 02 9320 9321
Name of Employer	Ove Arup Pty Ltd

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We trust the information meets with your requirements however should you have any questions or would like to discuss further any aspect of the above please feel free to contact me at anytime on +61 2 9320 9598 or +61 (0) 409 773 005.

Yours sincerely



Peter Tomlinson
Associate Principal
Vertical Transportation Leader – Australasia & Asia Pacific