Memorandum

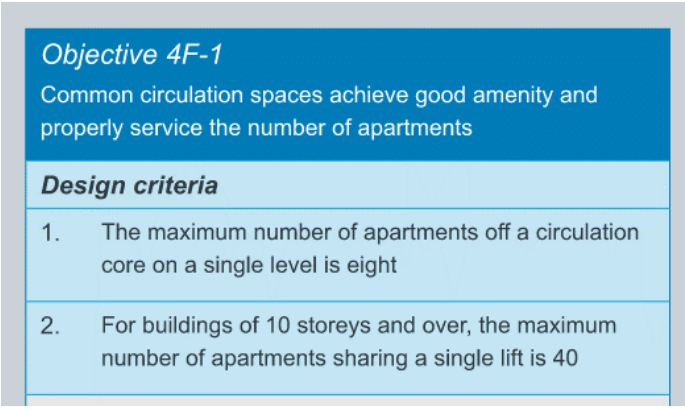
ARUP

To	Tracy Hoven (Touchstone)	Date	14 October 2020
Copies		Reference number	-
From	Scott Hampson	File reference	-
Subject	338 Pitt Street - Vertical Transportation DA Response		

This memo addresses the DA queries for the development of 338 Pitt Street Sydney including the application of the Apartment Design Guide for lifts and the use of lifts in emergency situations.

The Apartment Design Guide

The Apartment Design Guide (ADG) includes one requirement for vertical transportation being objective 4F-1, criteria 2 and this states that for buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40.



Objective 4F-1 Common circulation spaces achieve good amenity and properly service the number of apartments	
Design criteria	
1.	The maximum number of apartments off a circulation core on a single level is eight
2.	For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40

Our interpretation of the requirement is that where there are 2 or more lifts provided, as is the case at 338 Pitt Street, the number of apartments is not capped or restricted by the number of lifts provided. So, the provision of 2 lifts is a minimum for the whole development, if there are 40 apartments or more, and not a simple number of lifts per apartment.

The provision of two (2) lifts, or more than 2 lifts, ensures redundancy of lift service and continued access to an apartment rather than a level of performance experienced by a passenger in terms of waiting times.

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Arup has conducted lift performance analysis for 338 Pitt Street using two different methods (calculation and simulation) in order to confirm that performance is acceptable in terms of passenger waiting times, lift departure intervals, lift travel times, queue lengths and car filling levels.

The calculation method delivers a result in terms of lift departure interval (see publications by Stakosch, Barney, old versions of CIBSE Guide D etc). The simulation method delivers a result in terms of average waiting time (2020 edition of CIBSE guide D and papers by Peters Research)

In both types of analysis, the performance is deemed to be acceptable for the lifts at 338 Pitt Street.

We include the performance results for the North Tower below as confirmation of our statements and design.

Residential Passenger Lift Performance		
Criteria	Target	Outcome
Interval (seconds)	50-65	59
Average waiting time (seconds)	<45	43
2 – Way Handling Capacity (%)	5-7	6

Lifts Used in Emergency Situations

In emergency situations (other than a fire) the lifts may be operated as normal however it would be expected that lift waiting times would be longer than usual.

During fire events the lifts should not be used as indicated in NCC. There have been studies done for the use of lifts during fire evacuation, however we are not aware of any buildings in Australia where the use of lifts in a fire is permitted.

The Australian Building Codes Board (ABCB) produced a handbook in 2013 to discuss this topic. The results were that any fire evacuation plan involving lifts would require those lifts, associated building services and architectural layout to incorporate special features as listed below.

To use lifts for evacuation, essential lift and lift services elements include the following:

- Egress paths, landing space and lift size suitable for the number of people likely to use the lift in an emergency including adequate wheelchair manoeuvring space.
- A lift landing area protected from fire and smoke be it a lobby or refuge.

- High sensitivity smoke and fire detectors on lift landings, in the lift shaft and the lift machinery areas, zoned separately from all other areas so as to be the only alarms to initiate the lift shut-down sequence.
- Provision for water from other areas to be drained away from lift doors and sprinkler heads with a high temperature rating heads in machine rooms and machine areas.
- The management of smoke to protect landing areas and lift shafts.
- Audio and visual warning alarms suitable for people with a disability.
- Two-way communication between landings, lift cars and the fire indicator panel or the fire control centre, again, suitable for people with disabilities to use at the landing and in the lift car.
- Appropriate signage on whether lifts can be used in an emergency and who may use them noting that different alternative Solutions may warrant different signage thereby possibly leading to confusion for transient people, and again, being suitable for people with a disability.
- A reliable, redundant power supply.
- Complementary emergency management procedures including a building specific emergency plan, commissioning, inspection, testing and maintenance.

It is envisaged that the cost to supply lifts with these features would be 30 – 50% more than standard lifts and that the architectural consideration of lobbies etc would be difficult.

To progress this subject further we would envisage that the fire engineering team are commissioned to provide a detailed report.