30 November 2016

Phil Kiehne
Project Manager
Level 9, Tower Three, International Towers Sydney
Exchange Place, 300 Barangaroo Avenue,
Barangaroo NSW 2000Australia

Dear Phil,

Re: Response to Submissions for SSD7521 - North Plot and Square

In response to the Department of Planning & Environment's and the Sydney City Council's letters on the SSDA submission for the North Plot and Square at Darling Square, we note the following to be addressed;

> *12. Clarify the adequacy of the proposed lifts to service the likely patronage of the various uses within the building. In addition, justify the sharing of lifts between the childcare centre and restaurant/bar.*
>
> *And*
>
> *Commentary from the Applicant with regard to adequacy of vertical transport for the North Plot should be sought. The BCA Report lodged indicates the roof level restaurant and bar could be occupied by up to 689 patrons and the childcare centre, with 90 spaces, would be operating until 7.00pm. In the early evening, when both parents and retail patrons are wanting to use the lifts, many of which will have strollers, the potential access demands could be significant and warrant further lift shafts*

The lift engineering for the project has been carried out by Lendlease Design Vertical Transport Design Services and we confirm adequate lift performance of the proposed lifts during the early evening when potentially a peak may occur as childcare, bar / restaurant and library patrons may be requiring the use of the lifts at the same time.

The building design incorporates two passenger lifts for all patrons and one goods lift for use by all tenants. In addition the mezzanine is served by an external stair and the library is served by an external stair assisting the vertical transportation of patrons.

Lift Design Criteria

The unique combination of building uses, individually or concurrent are unusual for lifting design criteria and there is no published benchmark criteria both locally or internationally in guides such as Chartered Institution of Building Services Engineers (CIBSE) Guide D or The Vertical Transportation Handbook (Strakosch). Therefore the lifting analysis of the two passenger lifts has been modelled from first principles then simulated using Elevate (Peters Research) applying assumptions listed below.

Definition of Terms

The following definitions are important to provide background information to understanding the way in which lifting systems are designed and measured in terms of quality and performance, the following definitions should be understood.

Two Way Traffic – This is where the dominant traffic flow is to and from the main floor of the building, the main floor is the primary entry and exit from the lifting system, in this case “Ground Floor”.

Handling Capacity - This is the percentage of the buildings population that can be transported in a five minute period, with the car load at maximum of 80% of the cars designated capacity.

Average Waiting Time – This is the average period of time that a passenger waits for a lift after registering a lobby call until the lift doors begin to open.

Two way lunch criteria for A-Grade offices recommends a reasonable waiting time would be less than 40s, without any published benchmarks for the uses in The North Plot and Square we have aimed for less than 40s average waiting time.

Average Time to Destination – This is the average period of time from when a passenger registers a lobby call until the lift doors begin to open at the passengers destination.

Passenger Lifts

Lift Type, Capacity and Speed

- The two passenger lifts are 21 person with car dimensions 1700mm wide x 2000mm deep x 2500mm high (clear internal)
- Doors 1200mm wide x 2100 high
- Speed is 1.6m/s
- Group collective operational control
- They are designed to comply with the requirements of the SAA Lift Code AS1735, Workcover Authority and the NCC.
- The lifts will incorporate facilities for persons with a disability to comply with AS1735 Part 12 (NCC Compliance)

Potential Patron Traffic Peaks

- 7.00 - 9.00 for morning childcare peak two way - parent and child in, parent out
- 8.30 – 23.00 steady flow of low volume into and out of the library (in addition the library has an external staircase for alternative access to the lifts)
- 12.30 – 13.30 incoming for lunch to the bar / restaurant on level 5
- 15.00 – 16.30 outgoing lunch from the bar / restaurant on level 5
- 16.00 - 18.00 for outgoing childcare peak two way – parent in, parent and child out
- 18.30 - 20.00 peak incoming flow to bar / restaurant on level 5
- 20.30 – 21.30 two way for end of first sitting and start of second sitting in bar / restaurant on level 5

- 22.30 – 23.30 outgoing for end of second sitting in bar / restaurant on level 5

The potential highest overlap is the all-day low rate usage of the library mingling with the afternoon childcare whilst coinciding with arriving patrons to the restaurant

Traffic Assumptions

Library

- BCA capacity of the library is 268 on Level 1 and 231 on Level 2 for the purpose of evacuation spaces, toilets, etc. it is unlikely that crowded level of population would often occur, we have estimated typical peak populations of 214 and 185 respectively
- There is an external stair from ground to L1
- We have allowed a small arrival and departure throughout the day say 5 patrons per five minutes in to each floor and return (60 per hour each way to each floor)

Childcare

- There are 38 x 0-2 year olds on Level 3 and 52 x 2-5 year olds on level 4
- Staff have access to the goods lift for their arrival and departure
- 0-2 year olds would be in a pram when coming and going and that would take the space of 3 persons + parent (four spaces)
- 2-5 year olds would be walking with parent so allow two spaces
- In the afternoon pickup from 4 – 7 we could assume the last hour corresponds to the first hour of restaurant arrivals
- Travelling up to the childcare in the afternoon we have allowed 3 parents per 5 minutes to Level 3 and 4 parents per 5 minutes to Level 4 (7 total / 5 minutes or 84 per hour
- Travelling down the parent is joined by the child with child and extra space has been allowed, all incoming parents leave in the time period
- Additionally we have included a special operation that allows the lift to not pick up from the childcare should it include passengers from the bar / restaurant, this would be enabled if the childcare patrons were concerned with the passenger mix of that floor, however the identified peak traffic is during the inward flow to the bar / restaurant and therefore this operation would not be occurring concurrently

Bar / restaurant

- The design capacity is 400 people including staff
- Two evening sittings would be normal with two hours between sittings, and there would be a break to set up between lunch and first dinner sitting, therefore the bulk of lunch patrons will leave around 15.30 and the first of dinner start to arrive at 18.00 and keep arriving next 1.5 hours
- Therefore the peak arrival flow over 90minutes equates to 22 passengers upwards per five minutes, we have used 30 in the model

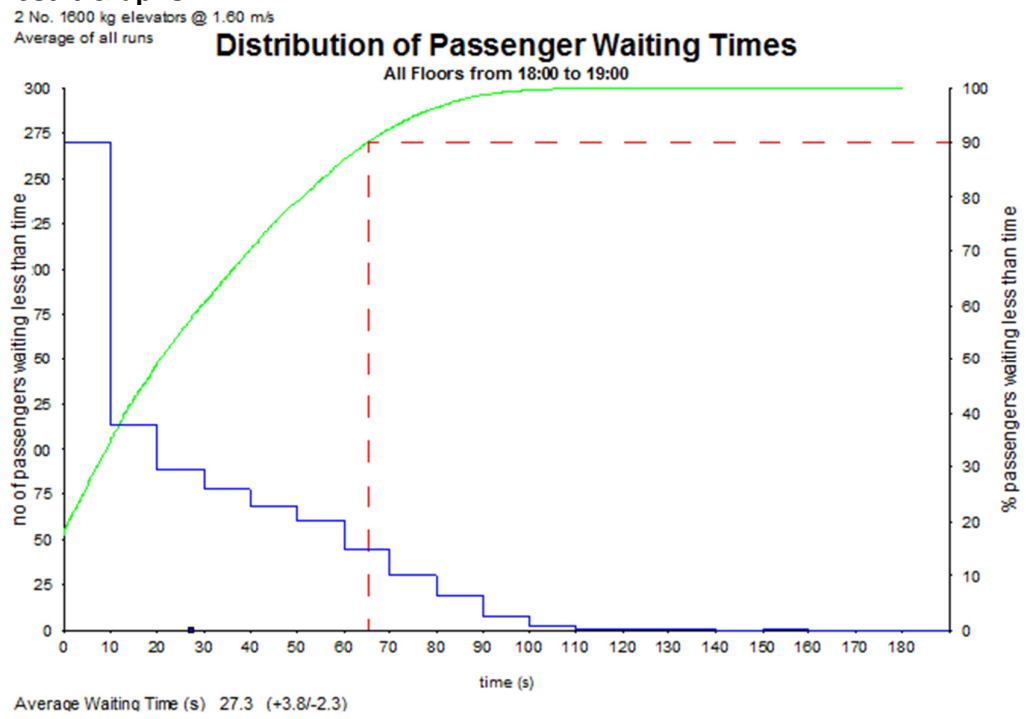
Traffic Simulation

The assumptions above were applied to Elevate (V8.22) using the advanced data mode and a series of ten simulations carried out for the period from 17:00 to 19:30. The overlapping period of 18:00 to 19:00 was reviewed and is presented below.

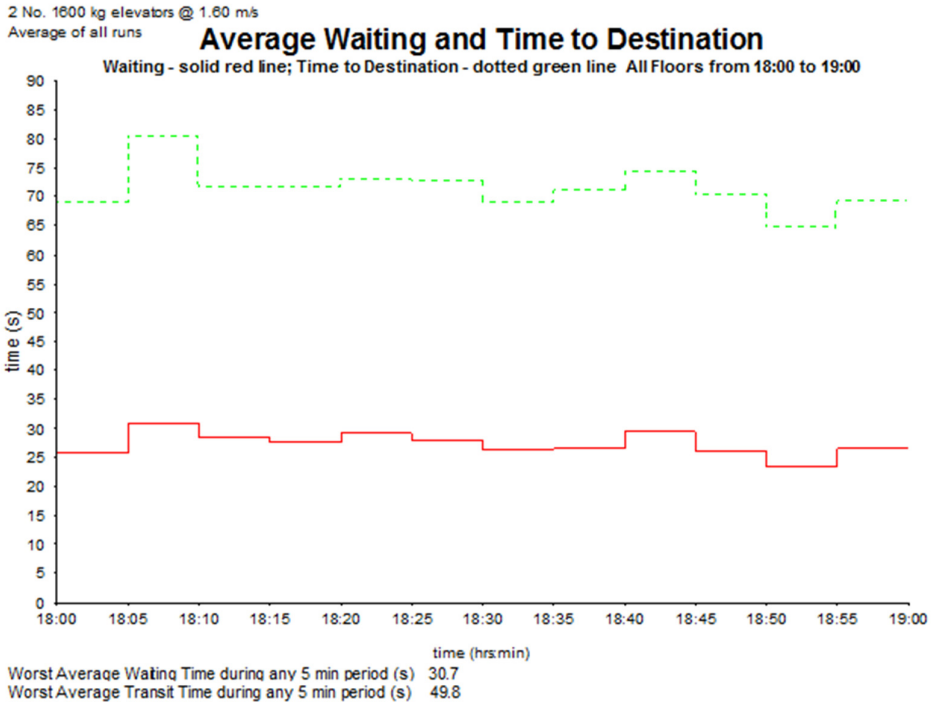
The results for this period were as follows

1. Average waiting time during period 27.3s
2. Worse waiting time during period 30.7s
3. Average time to destination during period 71.4s

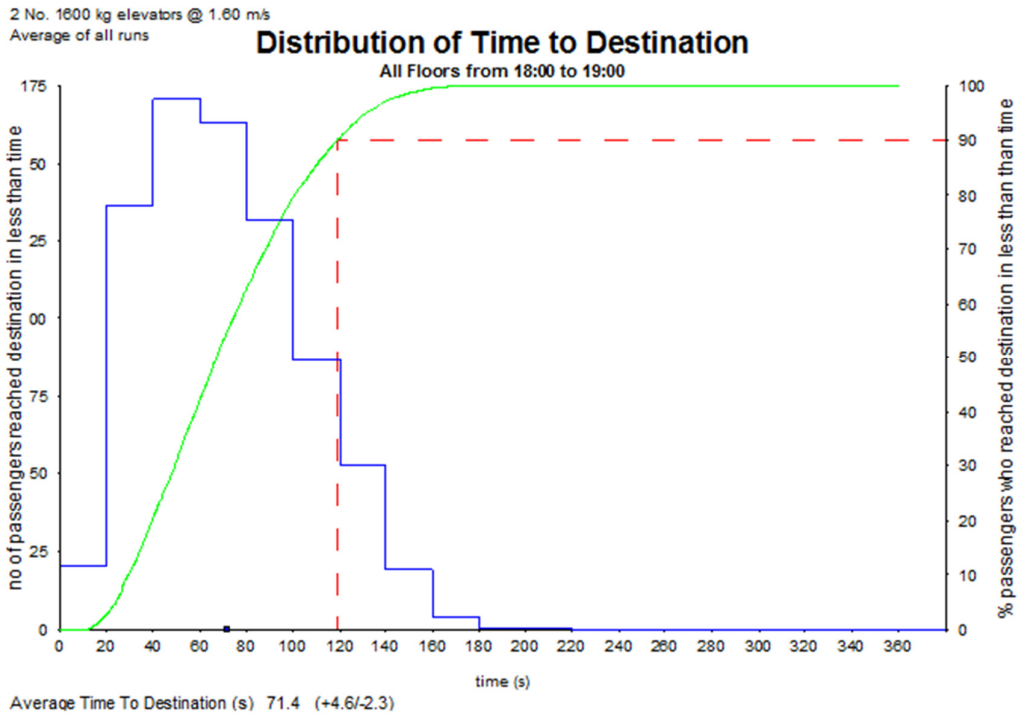
Result Graphs



Graph 1) Average Waiting Time



Graph 2) Worse Average Waiting Time



Graph 3) Time to Destination

Goods Lift

Lift Type, Capacity and Speed

- The single goods lift is 1800kg Class A loading with car dimensions 1800mm wide x 2000mm deep x 3000mm high (clear internal)
- Doors 1300mm wide x 2400 high
- Speed is 1.6m/s
- Simplex collective operational control
- It is designed to comply with the requirements of the SAA Lift Code AS1735, Workcover Authority and the NCC.
- The lift will incorporate facilities for persons with a disability to comply with AS1735 Part 12 (NCC Compliance)

Again the unique combination of building uses individually or combined does not fall into a typical goods lifting benchmark, the following however give guidance.

- PCA Guide to Office quality – An A-Grade office building would be provided with one goods lift of greater than 1400kg Class A loading, however in buildings less than 30,000m2 NLA the goods lift does not have to be dedicated
- Hotel developments – benchmark is one goods lift for every two passenger lifts, typical provision is 1800kg Class A

Therefore the provision of one dedicated 1800kg goods lift is over the requirements of an A-Grade office building and equal to those of a hotel, given there is no benchmark for The North Plot and Square this provision is believed to be suitable

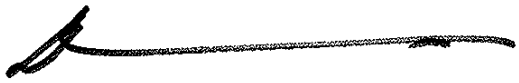
The goods lift also provides the primary emergency lift for the building and in the event of an evacuation will be available to evacuate 0-2 year olds in cots from the childcare.

Conclusions
The results show the current passenger lifting design for The North Plot and Square provide suitable level of service in the peak overlapping afternoon traffic period, in all other periods the performance would be further enhanced.

Also the dedicated goods lift provisions are appropriate for the buildings uses.

Should you require further information please don't hesitate to contact me.

Yours Sincerely



Ian S. Robinson
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cc: Nishi Patel Lend Lease Building