

NOTICE TO THE MAYOR AND COUNCILLORS

A special meeting of the Council of City of Prospect will be held in the Prospect Town Hall, 126 Prospect Road, Prospect on **Tuesday 11 September 2018 at 6.15pm**

AGENDA

- 1. Apologies**
- 2. On Leave**
- 3. Reports**
 - Item 3.1 CLIC Tender Package Outcomes and Below the Line Items**
(Pages 1-16, Recommendations on Page 1)
- 4. Closure**



Cate Hart
Chief Executive Officer

10 September 2018

AGENDA ITEM NO.: 3.1

TO: Special Council on 11 September 2018

DIRECTOR: Nathan Cunningham, Director Community & Planning

REPORT AUTHOR: Chris Newby, CLIC Project Lead

SUBJECT: CLIC Tender Package Outcomes and Below the Line Items

1. EXECUTIVE SUMMARY

The progressive release of works tender packages has reached a point where the project Team can forecast the project expenditure with greater certainty.

The results of the tender processes have shown a positive result in relation to the forecast budget, meaning that the soil contamination costs have been able to be absorbed without utilising the construction contingency funds and without extending the budget.

The results have also shown that a number of the highest priority 'below the line' items are able to be progressed immediately; some of which have some timing pressure on those decisions.

The Community Reference Group have also provided feedback, guidance and perspective on how the community would value the below the line priorities. This feedback, together with the previous position of Council from the 26 June 2018 meeting, the discussions of the Project Executive Group, and expert input from members of the Project Team, have influenced the recommended priorities.

Based on these considerations, it has been recommended to fund and deliver four (4) key 'below the line' items which are confirmed as now being affordable without extending project budget. Those items are: Irish Harp Room Jarrah Flooring, Façade Lighting, Pergola Structure to Rear Deck & Second Lift.

The recommendation also outlines that the CEO will be delegated the authority to continue to capitalise on opportunities which arise throughout the project to include additional 'below the line' items as part of the project through its construction phase.

2. RECOMMENDATION

- (1) Council, having considered Item 3.1 CLIC Tender Package Outcomes and Below the Line Items receive and note the report**
- (2) Council endorses the updated priority list of 'below the line' items, noting the four (4) items to be progressed of; Irish Harp Room Jarrah Flooring, Façade Lighting, Pergola Structure to Rear Deck & Second Lift and confirms the Chief Executive Officer is delegated to progress other items in the order of priority should resources become available through the progression of the project.**

3. DISCUSSION & BACKGROUND

Project Financial Position

The majority of tender packages for the Community Hub, Library and Innovation Centre (CLIC) have now been let, and the team has increased confidence in relation to the financial position of the project. As such, it is timely that an update be provided on which 'below the line' items are able to be delivered as part of the project.

Funding of these additional items has been achieved through letting gains (savings) that have been achieved as a result of the team's close attention to value management and working with the selected trades to ensure value for money outcomes on this significant project.

The project budget is summarised as follows:

Managing Contractor	\$1,105,758
Construction Works	\$13,469,242
Furniture & Equipment	\$700,000
AV / ICT	\$200,000
Statutory Charges	\$75,000
Construction Contingency	\$650,000
Total Construction Budget (Excl GST)	\$16,200,000

*Professional fees are excluded from this report.

Council's Cost Planners Rider Levett Bucknall (RLB) have provided a comprehensive report to the Project Executive Group (PEG) concerning the current financial status of the project. Whilst the report contains some commercial details in relation to individual tenders and contracts and as such is unable to be released at this stage, the key points of the report as it relates to project budget are as follows:

- The total forecast cost for construction of the project remains at \$16.2m
- Trade tender savings to the value of \$265,386 (or 2.0% of the trade value of works of \$12,894,618) have been achieved, when compared to the budget allocated for these packages
- Below the line items to the value of approx. \$225,000 are suggested to be included in the forecast cost, and are able to be committed to at this stage for funding from letting gains
- Soil remediation (latent condition) costs have been absorbed, and are funded from letting gains / design contingency
- A further \$163,000 of value management savings have been identified for Joinery, Brickwork, etc
- Provision has been included for additional trade works (and builder's preliminaries) necessary to complete the associated scope of work, in those cases where the preferred tender did not address all works required as part of that trade package (noting this is normal practice of tenderers on bespoke projects).
- The Construction Contingency remaining is \$609,000 (with only \$41,000 committed to date) with 12 months to completion of the project, and in RLB's opinion this amount should be sufficient to complete the works.

These are particularly pleasing results and the project team are to be commended for their focus on Time, Cost and Quality of the project. The project contingency, which is in place to accommodate necessary changes while construction is underway, would only be used to fund the 'below the line' items once further stages of the project are completed and there is confidence that these funds can be expended with minimal project risk.

Below the Line Items (to be committed to now)

Council endorsed the prioritisation of a number of 'below the line' items for the CLIC at its meeting of 26 June 2018. Some of these items have been included in tender packages through necessity as they would form an integral part of that package and required design work to be undertaken (such as the pergola on the rear balcony). These have naturally been 'disclaimed' in the tenders as being subject to budget availability.

There are other items which can be tendered separately (such as the Town Hall bar and sound booth upgrade) and do not require detailed design to be undertaken, until such time as Council has committed to their delivery (noting that this authority has been delegated to the CEO as per the June 2018 Council resolution).

At the June meeting, Council authorised "expenditure by the Chief Executive Officer of available funds achieved through savings from the CLIC project budget in order to deliver the *CLIC – Prioritised 'Below the Line' Items* in order of priority, with high priority items to be delivered in the specified order, and with discretion to deliver medium and low priority items subject to available funds." With additional investigations undertaken into the delivery of these items, this report provides an update to Council on which items are able to be delivered as part of the CLIC project based on letting gains achieved to date.

The table below outlines an amended version of the priority of 'below the line' items which was endorsed at the June 2018 Council meeting. The amendments have been to highlight the items which are recommended (and are now known as affordable), whilst also raising the Second Lift from the lowest of the Medium priorities, to the highest of the medium priorities.

This shift has occurred for a number of reasons, not least of which has been the position of Council's Community Reference Group (CRG) as representatives of key community and stakeholder groups. Their view has reinforced the top 3 items from Council's perspective are worthy of pursuing, however the CRG unanimously agreed that the second lift should be the highest (number one) priority of all of the below the line items.

This item had been identified by Council as only a medium priority item, but there was concern from the CRG that the installation of the second lift would never occur if not committed to now. In addition, the CRG highlighted the importance of the lifts for people with a disability, particularly if a number of disabled persons arrived at the same time (such as from the Community Bus).

They also pointed out the desirability of two lifts during times of peak usage and ensuring minimal delays, particularly for those entering the CLIC from the carpark which is a key access point of the building. This position is supported by the vertical demand analysis undertaken by Lucid Consulting, which is discussed later in this report.

It should be acknowledged that the recommendation to this report will lead to all three (3) high priority items endorsed by Council being delivered, as well as the item of highest priority to the CRG, without risk to project budget (with RLB advising that \$15,613 of letting gains would remain at this stage after committing to these 4 items, and \$609,006 of contingency yet to commit).

Item	Est. Cost (excl. GST)	Expected Cost (excl. GST)	Council Priority (H/M/L)	CRG Priority (H/M/L)
Irish Harp Room jarrah flooring	\$18,000	\$30,000	High	High
Façade lighting	\$45,000	\$45,000	High	High
Pergola structure to rear deck	\$38,000	\$40,000	High	High
Second Lift	\$110,000	\$110,000	Medium	Highest
Town Hall mechanical services upgrade and roof replacement	\$135,000	TBD	Medium	Medium
Town Hall motorised curtains	\$24,000	\$24,000	Medium	Medium
Renewal of Town Hall bar (including joinery & equipment) and sound booth (joinery only)	\$35,000	TBD	Medium	High
Town Hall lighting upgrade	\$120,000	TBC	Low	Low
Town Hall pop up furniture	\$5,000	TBC	Low	Low

The CRG acknowledged that the timing of installation of items as part of the CLIC project was an appropriate factor for consideration, along with cost and anticipated community benefit. The renewal of the Town Hall bar and sound booth also garnered a high level of support, along with an acknowledgement that this was not necessarily as time critical as some other items, but nonetheless desirable that all of the 'below the line items' are delivered as part of the project if possible rather than requiring further work in the future. Additional information on each item that will be committed to at this stage is subsequently provided further throughout the report.

Additional Information - Irish Harp Room Jarrah Flooring

The Irish Harp Room jarrah flooring (which is an option over and above the budgeted marmoleum flooring) was the number one priority of Council, and the second highest priority of the CRG. The CRG noted that they would still use the space as intended if a marmoleum floor finish was used, but acknowledged that the additional investment in this space would be of aesthetic benefit and better complement the Town Hall.

The existing flooring in the Irish Harp Room is carpet overlaying a vinyl tile, which has then been laid over the baltic pine floorboards beneath. The tile has been tested and confirmed as containing asbestos, which will require additional care (while also attracting some additional cost) in its removal and disposal. The floor joists have been inspected and appear to be in good condition, although inspection by an engineer would be undertaken as necessary.

The total replacement of the floor with a timber floor to match the Eliza Hall also provides an opportunity to attempt to reduce the significant difference in floor levels between the Irish Harp Room and the Vine Plaza foyer entry (as well as the central corridor), and the transitions currently in place between these spaces (which are short, steep ramps).

Given the extent of works involved and the desirability of this item, it is therefore necessary that this 'below the line' item is committed to now. It is confirmed that this item is now affordable without extending the budget.

Additional Information - Façade lighting

The façade lighting concept was considered and endorsed by Council at its May meeting for further design development, and has been identified as a high priority by both Council and the CRG. The initial concept was based on the idea of a continuous LED strip light running along the bottom of the façade screen, set off sufficiently to allow for an even wash of light across the façade (see below left for conceptual model). This concept was endorsed subject to funding (noting further design development would be required).



External lighting of the Town Hall was also given initial consideration (above right), which used a combination of 'wash' lighting and spotlights to highlight the heritage building's façade. This related work was deferred for further investigation as part of the Vine Plaza Integration Plan.

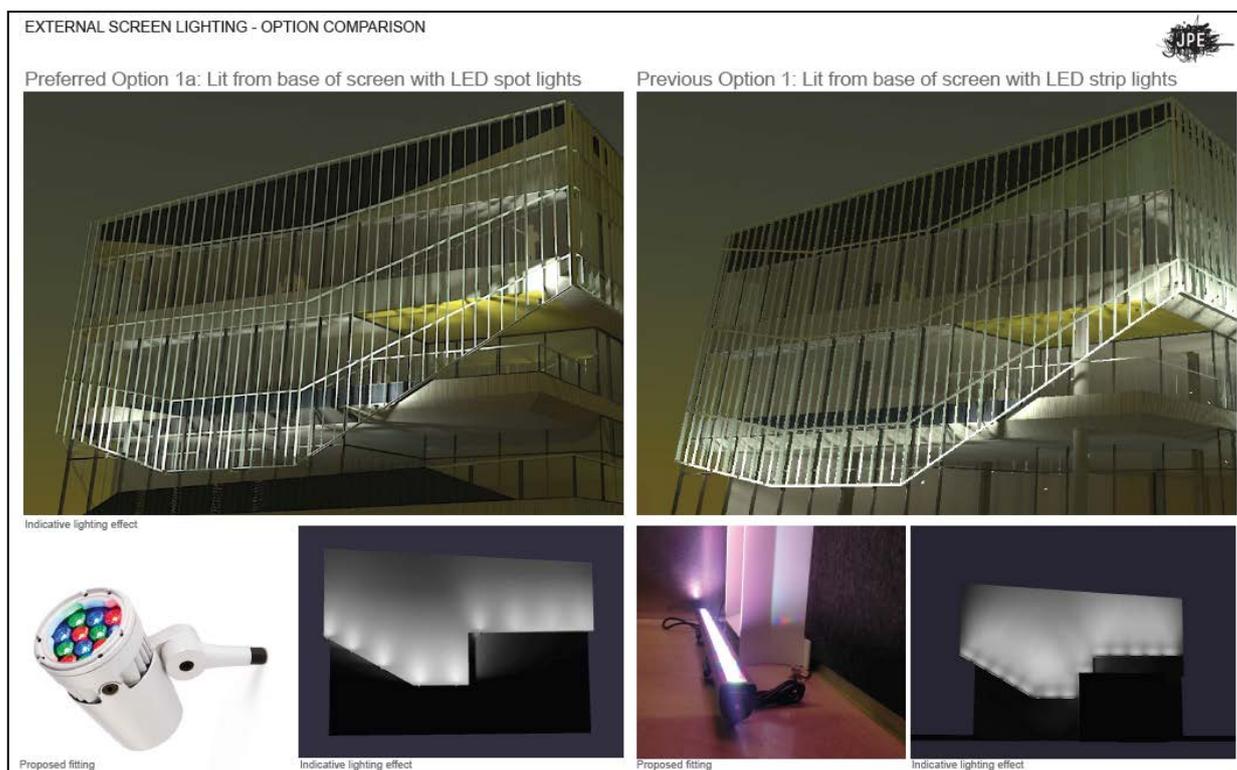
The key elements of the CLIC external façade screen lighting strategy are to:

- Light the screen from the exterior to show its colour and shape, and to avoid 'silhouetting' (i.e. don't light the gap between the window and the screen)
- Ensure the light fittings do not detract from the appearance of the screen
- Adopt fittings that allow the use of coloured light
- Sequence the lights so they can all be controlled/ programmed together

- Illuminate the screen from the base, with light being cast/washed upwards to highlight the sculptural shape of the screen
- Allow ease of maintenance of the fittings (including consideration of access, drainage, and limiting opportunities for pigeons to perch/roost)
- Ensure a cost-effective design solution.

During further design development, the design team have undertaken a review of the initial concept and are concerned that (in application) it would not satisfy the objectives of the lighting strategy. Of particular concern was that the continuous steel channel bracket required to conceal the light fitting would be a prominent feature 'hanging' off the base of the screen (due to its depth and its continuous length along the bottom of the entire screen).

The team have subsequently developed an alternate lighting solution, comprising a series of LED spotlights (suspended out from the screen on a powder-coated steel bracket) spaced consistently along the base of the steel screen on all facades. The effect of this (option 1a – left) compared with that previously endorsed (option 1 – right) is illustrated below. Additional detail on the spacing and method of fixing to the façade screen is provided at **Attachments 1-3**.



As can be seen, the 'spotlight' method creates a regular series of highlights along the façade, whereas the LED strip provides a more consistent 'wash' of light. The design team are confident that option 1a (above left) provides for a lighting solution that is highly consistent with the lighting strategy where the use of LED spotlights allows for greater flexibility in how the façade is illuminated, allowing for variety in the depth of light and shade across the façade (rather than a consistent wash). The spotlights are also a less obtrusive fixture that, although noticeable during daylight hours, will not make the bottom of the screen appear thicker than intended.

Discussion at the Community Reference Group meeting on 5 September confirmed option 1a as an improvement over the original concept, with members identifying that the solution greatly enhances the appearance of the façade at night whilst being less obtrusive during the day.

Members also suggested that the variety of light and shade across the façade screen reminded them of a delicate, semi-transparent butterfly wing. This evocative description is testament to the improvements that have been realised by the JPE team through design development, and provides strong support to the recommendation that this option be delivered as a high priority.

It is necessary that this priority item is committed now to ensure its fabrication as part of the façade screen. It is confirmed that this item is now affordable without extending the budget.

Additional Information - Pergola structure to rear deck

The pergola structure to the rear deck was also identified as a high priority by both Council and the CRG. The project team have already included it in the steel tender package to ensure its timely and cost-efficient delivery, based on early indications that letting gains would allow for additional expenditure within the endorsed budget. This assumption has proven correct and the item is affordable.

The pergola structure would provide essential shade and amenity to users of the rear deck, whilst providing opportunity for additional landscaping to be established. Ongoing maintenance of the landscaping, as well as cleaning of the deck and outdoor furniture, will be factored into the asset management plan for the new facility.

It is necessary that the pergola structure is committed to now, to ensure its delivery as part of the steel package. It is confirmed that this item is now affordable without extending the budget.

Additional Information - Second Lift

The option of a second lift was identified by Council as the 7th highest priority (medium) for delivery, while the Community Reference Group ranked it as the number one (highest) priority from the list of 'below the line' items. The CRG highlighted that the functionality of the building could be impeded if the additional lift was not provided, and were concerned that it may not ever be delivered if not included in the CLIC project, which they saw as an ongoing reputation risk to Council and the facility. They saw the convenience and accessibility as a necessity, above some of the other options that could be delivered later.

Lucid Consulting have provided Engineering Design Advice (refer **Attachments 4-6**) based on industry standard design criteria and factors including likely occupant numbers and arrival times. Their analysis resulted in a number of traffic simulations to assess the performance of the lift(s), and conclude that there may be a strain on the lift performance for short periods of time where people come into the building for an event on Level 1, particularly when both the basement car park as well as the Upper Ground level are both functioning as key entrance points. Such a scenario can result in the lift being full of passengers from the carpark and not being able to accommodate the Upper Ground floor arrivals, in which case a second lift will easily cater for this traffic.

Their report also suggests that a second lift would:

- Further ease traffic pressure on the lift arrangement, particularly during peak periods and especially during event arrivals and departures.
- Utilisation is spread across two rather than concentrated to one lift which reduces the likelihood of outages and increases the time between significant repairs/overhauls.
- No loss of functional area as the building has been designed to accommodate the second lift and there is no available saving to rationalise the core area due to structural engineering requirements.
- Provision of redundancy, should one lift be out for service or in fault. Given the public nature of the building with facilities for the public at Upper Ground floor and Level 1 with almost all visitor parking leading visitors to access from the basement carpark, the level difference and distance from the main parking area (including disabled parking within the lower ground) to the Eastern and Southern entrances is substantial. Should a lift be out of order the travel distance from the lifts to the closest alternate entry point (for people unable to utilise the adjacent fire stair) is approximately 110m to the southern (Town Hall) entrance. This issue also affects the tenants and visitors to the top floor commercial tenancy.

In summary, incorporating a second lift will yield a much greater level of flexibility and reliability and hence greater performance for the building's use. This is particularly important in a facility where the programming of community programs and activities (and meetings) would result in groups of people arriving at particular times throughout the day.

Given the advantages of the installation of the second lift at the same time as the first lift, and taking into consideration the current financial status of the project, this 'below the line' item will be committed to now. It is confirmed that this item is now affordable without extending the budget.

Remaining Prioritised 'Below the Line' Items

The remaining items endorsed by Council for delivery as part of the CLIC project are as follows:

- Town Hall mechanical services (air-conditioning) upgrade
- Town Hall motorised curtains
- Renewal of Town Hall bar (including joinery & equipment) and sound booth (joinery only)
- Town Hall lighting upgrade
- Town Hall pop up furniture

Other items previously endorsed for delivery as part of the CLIC project (or as part of the Vine Plaza Integration Plan) are as follows:

- Town Hall replacement flag poles (4)
- Pavement adjacent Town Hall / Prospect Road (up to Cibo in front of Vine Plaza)
- Landscaping adjacent Town Hall / Prospect Road (up to Cibo in front of Vine Plaza)
- Vine Plaza lighting
- Town Hall canopy (on Prospect Road Side)

The previous resolution(s) of Council allows for these items to be delivered as funds become available, and as such they will be reported to Council in due course if they are able to be committed to.

4. CONCLUDING STATEMENTS

Community Reference Group (CRG) Feedback

The CRG was presented with an update on the project at its meeting of 5 September 2018, with the final selections for the fitout of the large meeting / events space (chamber) on level 1 presented, along with the preferred signage and wayfinding / artist integration concepts. The CRG was pleased with the final selections endorsed by Council for the large meeting / events space (chamber) on level 1, and were particularly excited by its useability as a space for community and programs or activities. There was also strong support from the CRG for the artist integration, wayfinding and signage concepts endorsed by Council.

Whilst there was a strong level of support overall, the selection of the full colour Council logo for the reception area was not supported. The timber logo option was preferred by the group as being more complementary to the design aesthetic and material palette of the building (particularly the ground floor proximate to the staircase). Concerns were also raised that the colour selection for soft furnishings was not complementary to the bold colours used in the Prospect Posters reinterpretation, or to the exterior colour palette of the Town Hall. These are examples of the interaction of individual design decisions and the potential impact these have on other elements of the project, and the design team will continue to consider these implications on the building as a whole.

Safety concerns were raised in relation to the bench abutting the balustrade on Level 1 (which could potentially be climbed on by small children), whilst the potential for views from the ground floor to people seated at these benches ("up-skirting") was also highlighted as a concern. These comments have been passed on to the design team for consideration to see what amendments can be achieved through construction as the joinery and furniture packages are finalised.

The support of the CRG for the project as a whole and the prioritised 'below the line' items should give Council a high degree of comfort in the project's delivery and the level of community satisfaction.

Conclusion

The project is in a strong financial position and it has been demonstrated that the three (3) high priority 'below the line' items (comprising the Irish Harp Room Jarrah Flooring, the Façade Lighting, and the Pergola Structure to Rear Deck) can be committed to at this stage without requiring additional project funding. In addition, a medium priority 'below the line' item (the Second Lift) can also be committed to within the current budget.

The Second Lift is the highest priority item of the Community Reference Group and committing to it at this stage is a good demonstration of the benefits of the co-design approach, and how the feedback of the reference group (as community representatives) has informed Council's decision-making processes throughout the iterative design process. The updated approach to façade screen lighting also highlights the benefits of

design development by the project design team, which has seen a number of elements of the building improved over the course of the project.

Independent expert analysis also supports these commitments (particularly the façade lighting and second lift) from a design and functionality perspective. Regular review of the project's financial position by Council's Cost Planner also ensures that committing to these four (4) 'below the line' commitments would not introduce risk to the project, whilst opportunity will remain for delivery of the other 'below the line' items. .

As such, there is a high level of confidence in committing to these four 'below the line' items at this stage.

ATTACHMENTS

Attachments 1-3:

JPE Design Studio – Façade Screen Lighting Detail

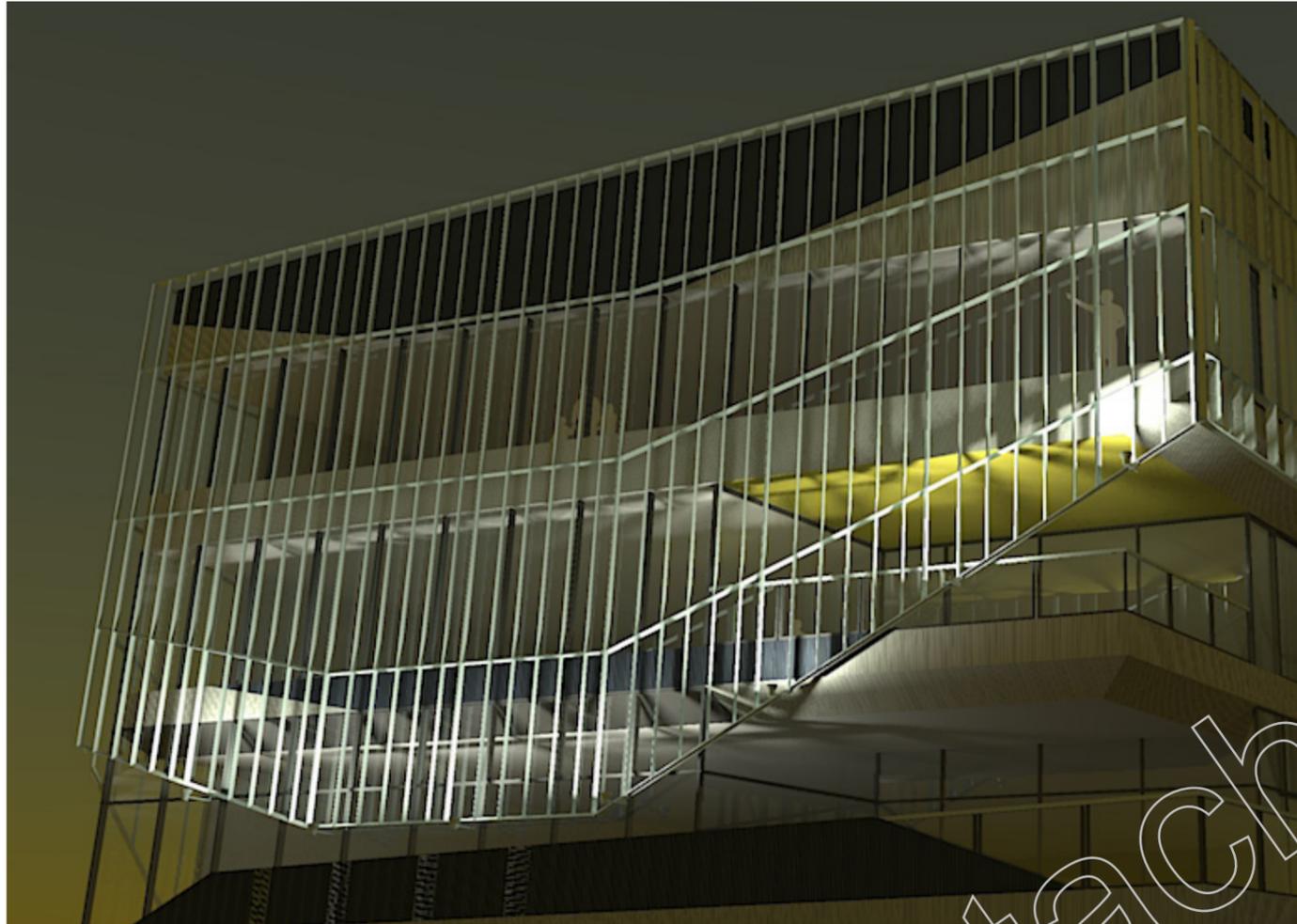
Attachments 4-6:

Lucid Consulting – Engineering Design Advice (Vertical Demand Analysis)

EXTERNAL SCREEN LIGHTING - OPTION COMPARISON



Preferred Option 1a: Lit from base of screen with LED spot lights



Indicative lighting effect

Previous Option 1: Lit from base of screen with LED strip lights



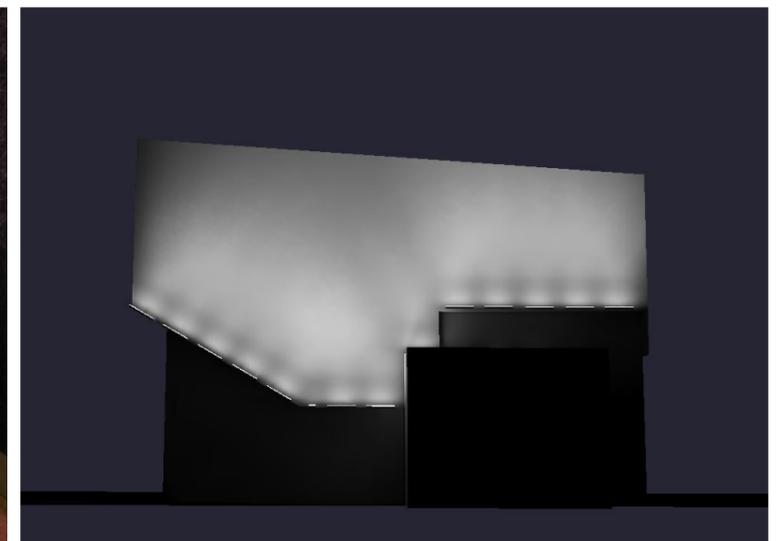
Proposed fitting



Indicative lighting effect

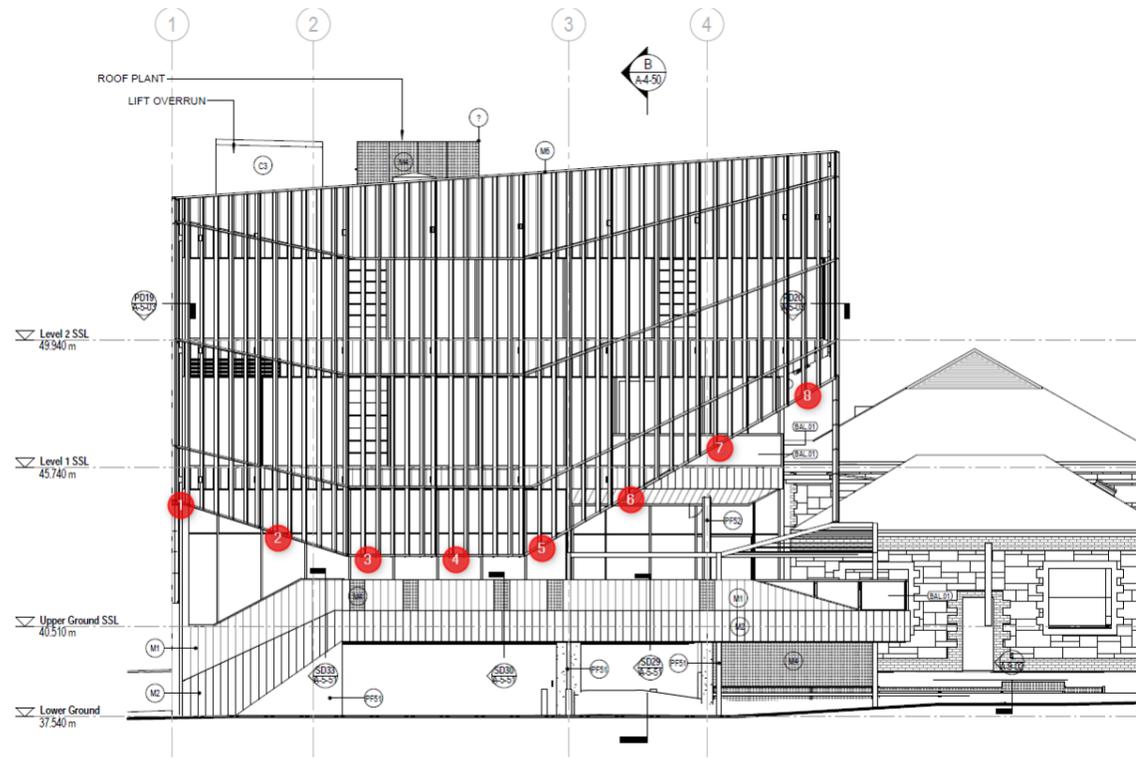


Proposed fitting

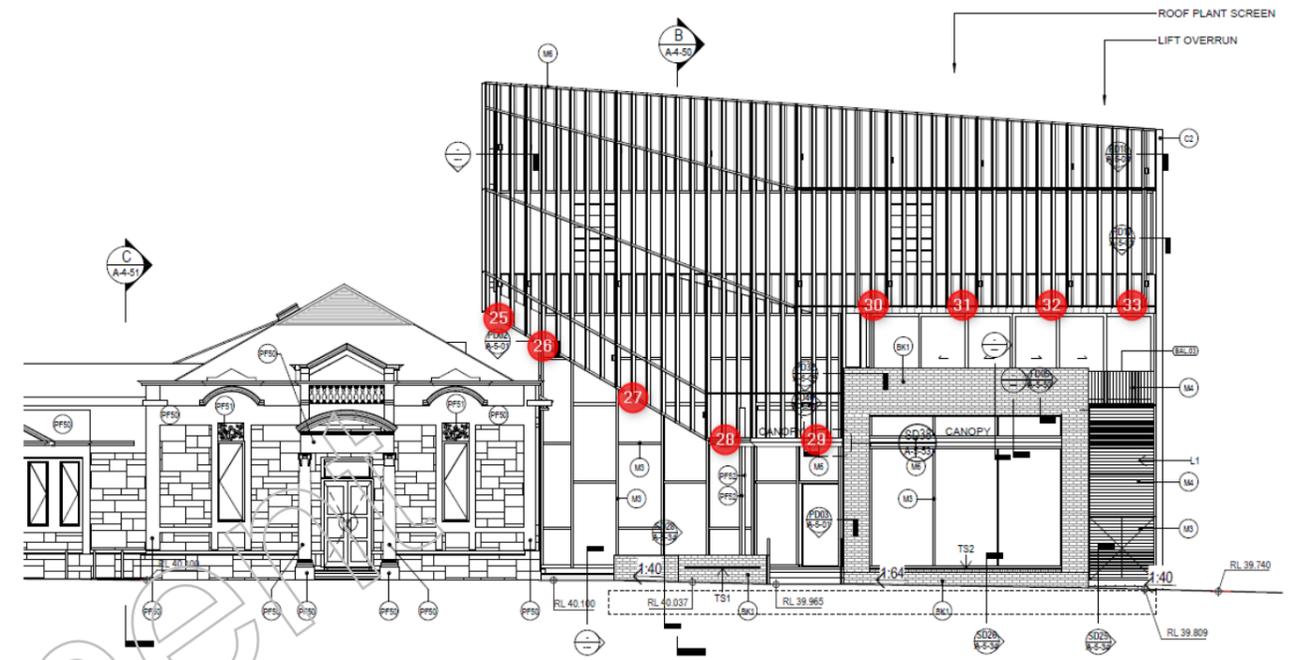


Indicative lighting effect

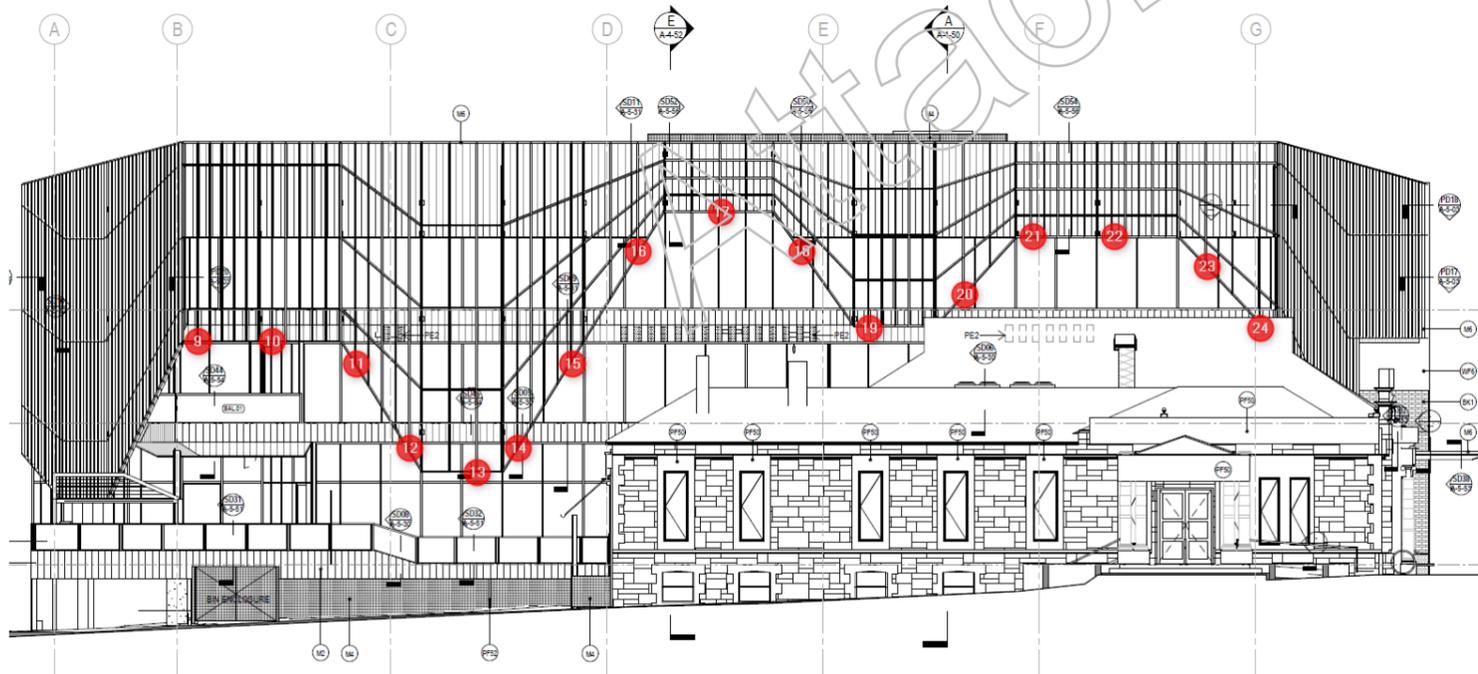
EXTERNAL SCREEN LIGHTING - INDICATIVE LOCATION OF FITTINGS (OPTION 1A)



1 BUILDING ELEVATION - WEST
1.A-1-50 Scale 1:100

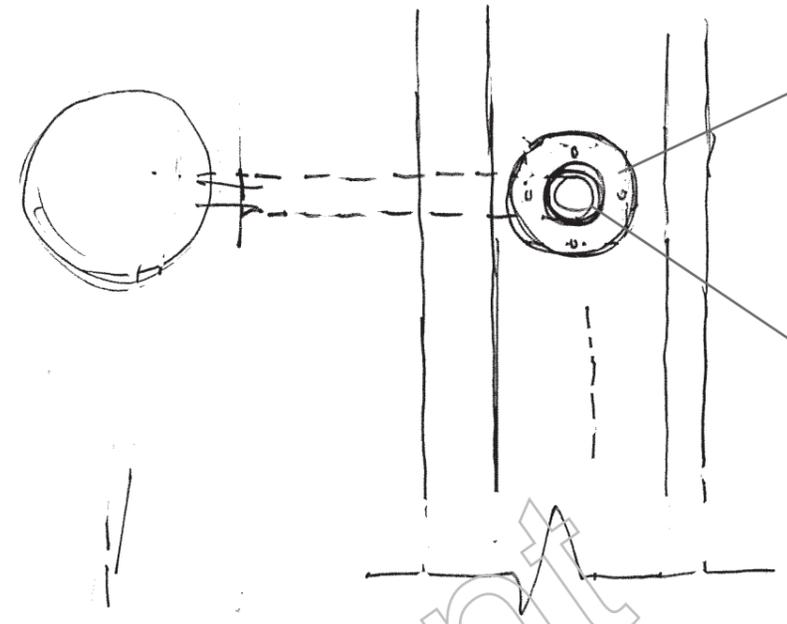


BUILDING ELEVATION - EAST



2 Building Elevation - South
1.A-1-50 Scale 1:100

EXTERNAL SCREEN LIGHTING - INDICATIVE DETAILS
(OPTION 1A)

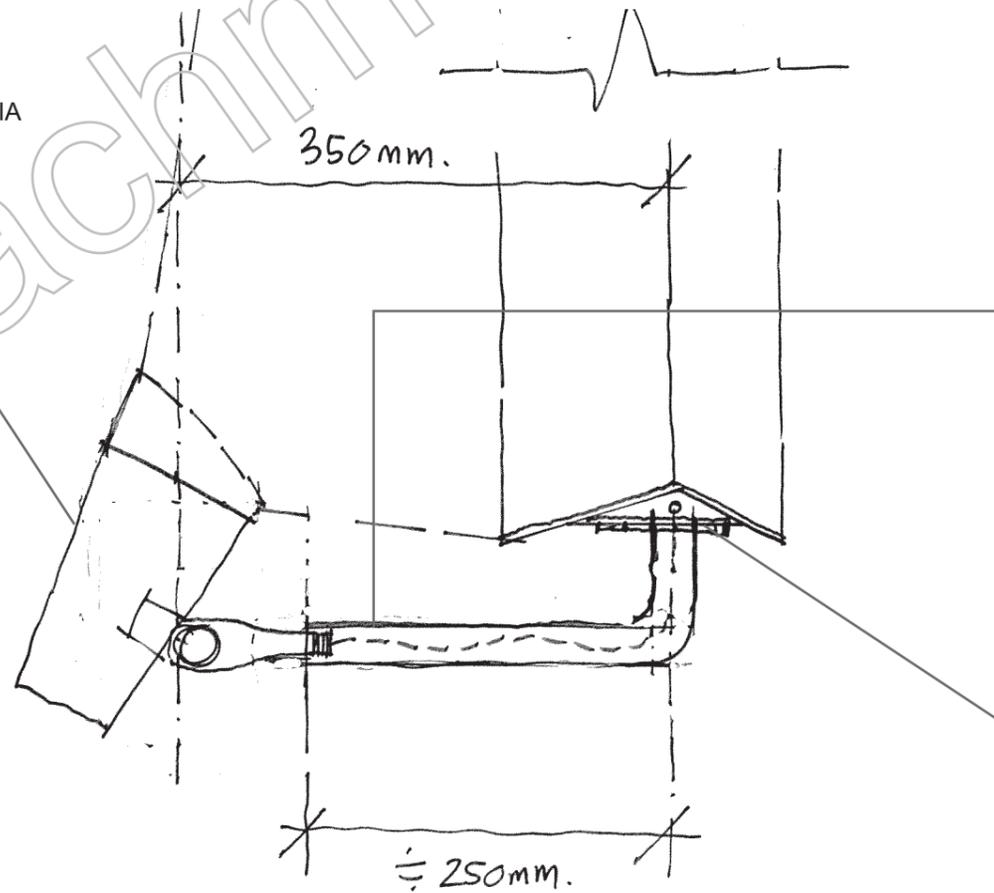
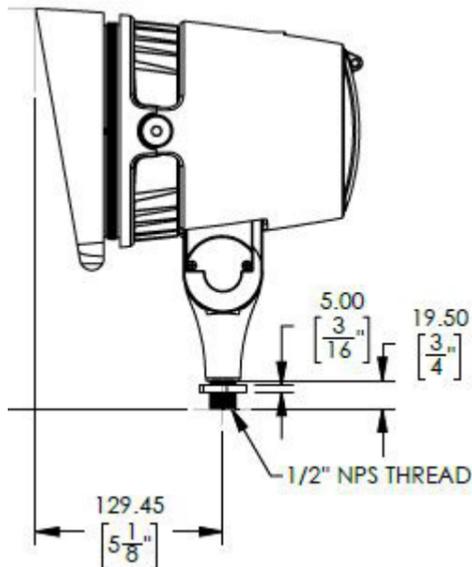


NOM. 90MM DIA. BASE PLATE WITH 4X SCREW FIXINGS.

NOM. 30MM DIA. HOLE IN PLATE TO ALLOW CABLES TO PASS THROUGH. TBC WITH ELECTRICAL ENGINEER.

PLAN DETAIL (VIEW FROM U/S SCREEN)

ADJUSTABLE LIGHT FITTING
PHILIPS / HIGHLIGHTING
CODE: BCP 462/12XLED-HB/RGB (123-000019-07)
FIXED TO MOUNTING ARM BRACKET VIA THREADED END.
LIGHT FITTING POWDERCOATED TO MATCH SCREEN (RAL 180 90 05 ACCEPTABLE)



LIGHT FITTING ARM BRACKET
CUSTOM FABRICATED NOM. 90MM DIA. BASE PLATE WITH 4X SCREW FIXINGS.
NOM. 40MM DIA. CHS BRACKET ARM WITH THREADED END TO SUIT LIGHT FITTING (REFER ATTACHED THREAD DIAGRAM).
CABLES CONCEALED IN BRACKET ARM.
POWDERCOATED TO MATCH SCREEN.

CABLE CONCEALMENT
CONTINUOUS NOM. 4MM STEEL PLATE WELDED TO UNDERSIDE OF BOTTOM FOLDED PLATE.
PROVIDE WEEP HOLES AT NOM. 1200MM CENTRES TO ALLOW WATER TO DRAIN.
POWDERCOATED TO MATCH SCREEN

SECTION DETAIL

ENGINEERING DESIGN ADVICE

Subject: Lift Arrangement

Project: City of Prospect – Community Hub, Library and Civic Centre

Reference: 14013-EDA-VT01

Revision: 02

Date: 13 July 2018

Pages: 1

The objective of this Engineering Design Advice (EDA) is to briefly outline the performance of the Vertical Transportation arrangement for a single and dual lift arrangement.

Various traffic simulations have been undertaken to assess the performance of the following:

1. Standard daily use (i.e. only the library, council administration and the Level 2 commercial tenancy. This simulation does not consider events held in the Upper Ground Town Hall, Upper Ground Gallery Space and the Level 1 Meeting/Events room)
2. Simulation 1 and considering an event within the Town Hall (i.e. a higher traffic use on the lifts from Basement to Upper Ground Level)
3. Simulation 1 and considering an event within the Level 1 Event Space (i.e. a higher traffic use on the lifts from Basement and Upper Ground to Level 1).

We note the assessments consider the following division of stair use and lifts based on guidance from CIBSE Guide D: Transportation Systems in Buildings. This information is based on a stair case in close proximity to the lift core. Note it is reasonable to expect that more people will use a stair case where a grand staircase (i.e. a staircase in the main foyer off the entry door) is provided.

Floors Travelled	Usage (Stair:Lifts)	
	Up (%)	Down (%)
1	10 : 90	15 : 85
2	5 : 95	10 : 90

The following table outlines the design criteria adopted for the traffic management study for the different building areas.

Design Criteria	Proposed Criteria
Number of Lifts	2
Car Capacity	Lift 1 = 1350 kg (1400W x 2100D car), Lift 2 = 1000kg (1400W x 1600D car)
Car Speed	1.0 m/s
Door Open / Close Time	2.5 s / 1.5 s
Start / Levelling Delay	0.5 s / 0 s (advanced door opening provided)
Passenger Transfer Time	1.2 s

The following table outlines the population allowances for each of the simulations option:

Design Criteria	Proposed Criteria
Simulation 1 Population	Upper Ground Level - 100 Level 1 - 135 Level 2 - 125
Simulation 2 Population (incl. Town Hall event)	Upper Ground Level - 300 Level 1 - 140 Level 2 - 125
Simulation 3 Population (incl. Level 1 event)	Upper Ground Level - 100 Level 1 - 215 Level 2 - 125
Simulation 4 Population (incl. Town Hall and Level 1 events)	Upper Ground Level - 300 Level 1 - 215 Level 2 - 125

Industry performance design criteria is not provided for low rise, low density office buildings, Criteria is only published for assessment in high rise / high density installations, where the need for traffic studies are more critical. However, for this project we have applied a level of principle we believe is relevant for this type building, which will be a relatively low density incoming traffic capacity, equivalent to 10% population per 5 minutes. For comparative purposes, a Grade A, CBD office building (greater than 5000m² over 6 levels) would have a peak traffic design capacity of 13% population per 5 minutes.

The following table outlines the expected performance for each population option listed above:

1 Lift	Proposed Criteria	Simulation 1	Simulation 2	Simulation 3	Simulation 4
Average Waiting Time	<35 seconds	32.2	32.8	39.4	69.8
Average Travel Time	<40 seconds	37.0	37.0	38.0	38.0
2 Lifts	Proposed Criteria	Simulation 1	Simulation 2	Simulation 3	Simulation 4
Average Waiting Time	<35 seconds	12.8	12.8	13.1	14.5
Average Travel Time	<40 seconds	29.4	29.4	29.3	29.8

As a sensitivity analysis the above simulations have been undertaken to include an increased density incoming traffic capacity, equivalent to 20% population per 5 minutes more reflective of an event space arrival profile.

The following table outlines the expected performance for each population option listed above under the increased incoming traffic density:

1 Lift	Proposed Criteria	Simulation 1	Simulation 2	Simulation 3	Simulation 4
Average Waiting Time	<35 seconds	395.6	389.7	571.8	615.6
Average Travel Time	<40 seconds	40.6	40.8	39.9	40.7
2 Lifts	Proposed Criteria	Simulation 1	Simulation 2	Simulation 3	Simulation 4
Average Waiting Time	<35 seconds	19.0	18.6	54.6	55.0
Average Travel Time	<40 seconds	36.0	36.2	37.5	39.0

Based on the above data, a single lift will be suitable for most cases. However, it is expected that there may be a strain on the lift performance for short periods of time where people come into the building for an event on Level 1 and are using the basement car park as an entry as well as Upper Ground level. This scenario can result in the lift being full of passengers from the carpark and not being able to accommodate the Upper Ground floor arrivals, in which case a second lift will easily cater for this traffic.

We note that our assessments utilise a conservative stair factor for the travel between Upper Ground and Level 1 and we would expect that many more people would likely use the stairs from Upper Ground to Level 1 due to its position and presentation in the Upper Ground level foyer, which would ease the pressure on people using the lifts where entering at Upper Ground level. However, this does not affect the movements from Upper Ground where significant traffic is initiating from the carpark.

The main benefits of providing a second lift are:

- Further ease traffic pressure on the lift arrangement, mainly during peak periods and especially during event arrivals and departures.
- Provision of redundancy, should one lift be out for service or in fault – Given the public nature of the building with facilities for the public at Upper Ground floor and level 1 with majority of parking at the lower ground level, the level difference and distance from the main parking area (including disable parking within the lower ground) to the Eastern and Southern entrances is substantial. Should a lift be out of order the travel distance from the lifts to the closest alternate entry point for people unable to utilise the adjacent fire stair is 110m to the Eastern entrance.
- Utilisation is spread across two rather than concentrated to one decreasing wear and the likelihood of outages and increased time between significant repairs/overhauls.
- No loss of functional area as the building has been designed to accommodate the second lift and there is no available saving to rationalise the core area due to structural engineering requirements.

The disadvantages of providing a second lift are:

- Increased capital cost.
- Increased maintenance costs to maintain 2 lifts in lieu of 1.

It should be noted implementing a second lift at a later date once the building is occupied will incur substantial additional cost to that during the initial competitive tendering period with the main construction works and also create significant inconvenience by way of lift outages, construction activity/noise and loss of carparking for layout/working as significant space is required to construct a lift.

In summary incorporating a second lift will yield a much greater level of flexibility and reliability and hence greater performance for the buildings use.