URBIS

PARRAMATTA POWERHOUSE (SSD-10416)

Submission to Applicant's 'Response to Submissions' made on behalf of the landowners of 32 Phillip Street, Parramatta

Prepared for Australian Unity Office Fund
November 2020

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Urbis has made all reasonable inquiries that it believes is necessary in preparing this report but it cannot be certain that all information material to the preparation of this report has been provided to it as there may be information that is not publicly available at the time of its inquiry.

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Urbis staff responsible for this report were:

Director	Murray Donaldson
Senior Consultant	Jocelyn McDowall

Project code	P0024807
Report number	Final

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EXECUTIVE SUMMARY

This submission has been prepared by Urbis Pty Ltd on behalf of the landowners Australian Unity Office Fund (**Australian Unity**) of 32 Phillip Street, Parramatta (**subject site**) in response to Powerhouse Parramatta application's (SSD-10416) (**Powerhouse SSDA**) **Response to Submissions (RTS),** dated 8th October 2020.

Following a meeting with the Department of Planning, Industry and Environment (DPIE) on the Wednesday 28th October 2020, **DPIE agreed that they will accept and consider a further written submission from Australian Unity** regarding the applicant's Response to Submissions.

This submission is written and should be read in conjunction with Australian Unity's original submission to the exhibition period in July 2020.

Significantly, the Powerhouse SSDA is immediately adjacent to the north, east and west frontages of 32 Phillip Street, Parramatta. The proposed design and operation of the Powerhouse Parramatta Museum (PPM) has the potential to impact Australian Unity's existing and future development potential, which requires detailed consideration.

This submission has been informed by a detailed review of the Powerhouse SSDA RTS material exhibited on DPIE's website. **Importantly, Australian Unity supports the establishment of the PPM given the social, cultural and financial benefits that will be delivered to Parramatta and Western Sydney. However, Australian Unity are seeking design refinements that ensure better integration of the proposal within the surrounding Precinct.**

Australia Unity engaged a specialist team of consultants to advise on the potential impacts of the PPM on the subject site. The specialist consultant team have provided recommendations related to key concerns, which are outlined in this and the original submission.

Prior to any determination of the SSDA by the Department, the critical concerns and requested actions identified in this Submission should be resolved, including:

- **Integration of both sites by an improved design outcome for the Civic Link**
- **Lack of certainty with operational and event management, as per the original submission; and**
- **Potential impact of increased flood affectation as a consequence of blockages to stormwater drains, as per the original submission.**

As discussed in this submission, our client requests the Minister for Planning consider the concerns and requested actions provided in determining the Powerhouse SSDA.

We would welcome the opportunity to meet with assessment officers from DPIE and the applicant (Infrastructure NSW) to discuss the content of this submission to ensure that all matters and concerns are taken into consideration in the determination.

CONCERNS AND REQUESTED ACTIONS

1) Civic Link

1a) The PPM project team should be requested to clarify the proposed landscape treatment for the Civic Link and meet with Australian Unity to discuss appropriate landscape treatment along the boundary with 32 Phillip Street

1b) The landscape treatment on the western side of the Civic Link should allow for ground level use of the 32 Phillip Street site (existing and future) to include active uses that address and make the most positive contribution to activating the Civic Link.

1c) The landscape treatment of the Civic Link should be open to allow pedestrian movement and visual connections between buildings on both sides of the Civic Link.

1d) The landscape solution for the PPM should provide for outdoor dining opportunities including licenced areas along the western edge of the Civic Link fronting the 32 Phillip Street site.

The above requests will assist in delivering the Government's vision for a preeminent site to active and integrate with the broader precinct.

2) Operation & Event Management Plan

2(a) In the absence of an Operation and Event Management Plan prior to consent being granted, a condition should be imposed requiring submission of the Plan to the Department for approval, prior to the issue of any occupation certificate. The Operation and Event Management Plan, should include, but not limited to:

- Summary of the development and operational details of trading hours and license(s)
- Approach to provision of Operator Services
- Methods of dealing with public authorities
- Precinct Interface Management Plan (Operating Phase)
- Traffic and Pedestrian Management Plan (Operating Phase)
- Transport and Accessibility (Operations)
- Security and Safety Plan (Operating Phase)
- Event Management Plans (including designated locations, capacity, equipment, booking, notification of neighbours)
- Public use of facilities
- Complaints and Action Register

The Plan should demonstrate consultative engagement with relevant stakeholders, including adjoining landowners.

2(b) A condition of any consent should enable the Department an/or Council to request a copy of the complaints register at any time, requiring the landowner to amend the Operational and Event Management Plan based on feedback from the relevant authority.

3) Flooding Impacts

3a) Australia Unity support the provision of amplified stormwater pipes on either side of 32 Phillip Street site.

3b) The flood impacts of the final PPM design should be tested using City of Parramatta Council's more up to date, and peer reviewed, flood model when it becomes available to ensure that there will be no adverse flood impacts on the subject site or the surrounding public domain.

3c) The PPM project team should be requested to provide updated flood modelling accounting for an appropriate blockage percentage for stormwater pits.

3d) The civil design solution must not increase flood levels adjacent to 32 Phillip Street.

INTRODUCTION

Purpose of Submission

This submission has been prepared by Urbis Pty Ltd on behalf of the landowners Australian Unity Office Fund (**Australian Unity**) of 32 Phillip Street, Parramatta (**the site**) in response to Powerhouse Parramatta application (SSD-10416) (**Powerhouse SSDA**) which commenced exhibition on 10th June 2020.

Significantly, the Powerhouse SSDA is immediately adjacent to the north, east and west frontages of 32 Phillip Street, Parramatta. The proposed design and operation of the Powerhouse has the potential to impact Australian Unity's existing and future development potential, which requires detailed consideration.

This submission has been informed by a detailed review of the Powerhouse SSDA EIS and Response to Submissions (RtS) material exhibited on the Department of Planning, Industry and Environment's website.

Australian Unity

Australian Unity is a listed property fund that invests in a diversified portfolio of office properties located across Australian metropolitan and CBD markets.

Australian Unity offers investors exposure to a well-located office portfolio, with income returns underpinned by leases to investment-grade tenants and access to the property management expertise of Australian Unity Real Estate Investment.

Australian Unity's portfolio is diversified across metropolitan and CBD markets in Sydney, Adelaide, Melbourne, Brisbane and Canberra.

Consultant Team

This submission has been informed by a detailed review of the Powerhouse SSDA on the existing and potential future state of 32 Phillip Street, Parramatta. Australia Unity engaged a specialist team of consultants to review the Powerhouse SSDA, including:

- Fitzpatrick & Partners (Architecture and Urban Design)
- Molino Stewart (Flooding)
- Windtech Global (Wind)
- Acoustic Logic (Acoustic)
- AT&L (Utilities and Services)
- Cornerstone (Construction Management)
- Urbis (Planning & Transport)

KEY CONSIDERATIONS AND CONCERNS

Consideration 1 – Integration of Sites Through Civic Link

The Civic Link is an integral component of the PPM proposal, in particular in establishing an integrated and connected precinct to the existing services and infrastructure within Parramatta CBD.

Australian Unity's original submission raised a number of key concerns regarding the integration of the sites based on the Civic Link design, including:

- Inconsistencies of information submitted within the SSDA EIS regarding the density of vegetation in the Civic Link;
- Location of vegetation along the western boundary of the Civic Link creating a restrictive design for activation of both eastern and western frontages; and
- The 1m variation of proposed levels east-to-west on the Civic Link and associated design implications for activation of the frontage.

Despite widening of the Civic Link as a result of changes to PPM building envelopes, the PPM RTS seeks to provide continuous landscaping to the western frontage of the Civic Link, surrounding the boundary of 32 Phillip Street.

Aligned to the original submission, concern is raised of the capacity for this design approach to provide an integrated precinct whereby the PPM design demonstrate the following principles:

- Pedestrian connectivity both within the site and broader Parramatta CBD, including adjoining sites;
- Activation of important frontages to the existing and proposed public domain, that will enable the success of vision for a pre-eminent Government site;
- Public domain design outcomes that support the future redevelopment adjoining sites, and do not impede the potential for enhanced integration (e.g. outdoor dining opportunities); and
- Appropriate ground levels that support the above principles, and required flood outcomes for the site and surrounds.

To support Australian Unity's Response to the RTS, Fitzpatrick and Partners have prepared three landscaping options of existing and potential building and ground floor land uses (refer to Appendix A).

Implementation of the above and proposed requests will assist in delivering the Government's vision for a preeminent site to active and integrate with the broader precinct.

Figure 10 – Site Plan – Civic Link

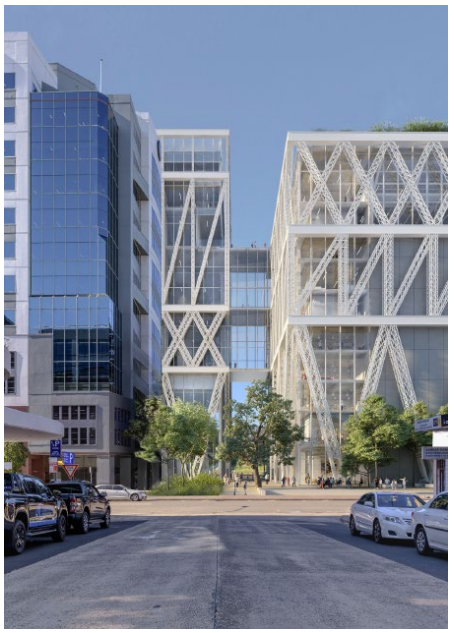


Figure 11 – 3D Perspective – Civic Link

Requested Actions:

1a) The PPM project team should be requested to refine the proposed landscape treatment for the Civic Link and meet with Australian Unity to discuss appropriate landscape treatment adjoining the boundary with 32 Phillip Street

1b) The landscape treatment on the western side of the Civic Link should allow for ground level use of the 32 Phillip Street site (existing and future) to include active uses that address and make the most positive contribution to activating the Civic Link.

1c) The landscape treatment of the Civic Link should be open to allow pedestrian movement and visual connections between buildings on both sides of the Civic Link.

1d) The landscape solution for the PPM should provide for outdoor dining opportunities including licenced areas along the western edge of the Civic Link fronting the 32 Phillip Street site.

KEY CONSIDERATIONS AND CONCERNS

Consideration 2: Operational and Event Management Uncertainty

The PPM EIS states that the project will present an annual program of large-scale cultural and community events for up to 10,000 people. This reflects the aspirations of its communities and expand the cultural calendar of Sydney and NSW. Given the significance of the PPM for the people of Parramatta and Western Sydney, Australian Unity expected that the EIS include details on the operation and management of major events.

Events and operational management will have a social, environmental and economic impact in terms of integrating with adjoining land uses, informing the design and management of the public domain as well as traffic and pedestrian connectivity is identified as critical. This aligns with the requirements of the SEARs, as issued by DPIE, particularly Item 4 (Integration with surrounding areas), Item 5 (Public Domain) and Item 11 (Transport, Traffic, Parking and Access).

The absence of this information was raised within the PPM EIS was identified in Australian Unity's original submission. Following a review of the RTS, PPM provided additional information that noted:

> *The public domain areas are intended to support temporary community activities and events that contribute to the Powerhouse programming. These could include live performances, temporary public art, public lectures, film/cinema pop-ups, cultural events such as Diwali, Eid, or Parramasala, and events which engage communities and contribute to the cultural calendar of Sydney and NSW. The majority of activities/events hosted on the site will be ephemeral smaller civic, community and cultural functions that can occur concurrently with other activities and exhibitions and are non-transactional (i.e. no purchased tickets).*
>
> *Events hosted in the public domain outside of the typical day to day operations of Powerhouse Parramatta will be subject to separate and future approval. These could comprise activities hosted by the Powerhouse or other parties such as City of Parramatta Council, and will consider emergency and event access to the river foreshore within the site and how access to the site will be secured, if required.*

Australian Unity considers this to be an insufficient response to the concerns and requests made in the original submission for an Operation and Event Management Plan.

Requested Actions:

2(a) In the absence of an Operation and Event Management Plan prior to consent being granted, a condition should be imposed requiring submission of the Plan to the Department for approval, prior to the issue of any occupation certificate. The Operation and Event Management Plan, should include, but not limited to:

- **Summary of the development and operational details of trading hours and license(s)**
- **Approach to provision of Operator Services**
- **Methods of dealing with public authorities**
- **Precinct Interface Management Plan (Operating Phase)**
- **Traffic and Pedestrian Management Plan (Operating Phase)**
- **Transport and Accessibility (Operations)**
- **Security and Safety Plan (Operating Phase)**
- **Event Management Plans (including designated locations, capacity, equipment, booking, notification of neighbours)**
- **Public use of facilities**
- **Complaints and Action Register**

The Plan should demonstrate consultative engagement with relevant stakeholders, including adjoining landowners.

2(b) A condition of any consent should enable the Department an/or Council to request a copy of the complaints register at any time, requiring the landowner to amend the Operational and Event Management Plan based on feedback from the relevant authority.

KEY CONSIDERATIONS AND CONCERNS

Consideration 3 – Potential Overland Flooding Impacts

The SEARS sets out the requirements for the EIS to include an:

- *Assessment of flood risk in accordance with the guideline contained in the NSW Floodplain Development Manual 2005, including potential effects of climate change, sea level rise and an increase in rainfall intensity and integration with Council's wider flood risk management planning and flood modelling.*

To support Australian Unity's original submission, Molino Stewart were engaged to provide advice to Australian Unity on the implications of the PPM.

Both the PPM site and the subject site are affected by two types of flooding:

- Riverine flooding where the Parramatta River rises and overflows onto the sites; and
- Overland flooding where water which exceeds the capacity of the underground street drainage network runs through the streets and other open space areas between buildings on its way to the Parramatta River.

Following review of the RTS, Australian Unity remain concerned regarding the overland flooding considerations.

The existing 600mm diameter pipe which currently runs under Dirribarri Lane and the multideck carpark will be replaced by a 1200mm diameter pipe running under Dirribarri Lane and heading directly north to the river. On the eastern side of the subject site a new 600mm pipe will be laid to take water directly to the river between the two museum buildings.

Molino Stewart have raised concerns with the flood modelling prepared by Arup at Appendix O of the EIS. In particular, concerns are raised in relation to whether adequate consideration has been given to the potential blockage of stormwater pits. Blockage in stormwater pits has the potential to change the reported flood modelling results.

It is noted that City of Parramatta Council requires an assumption of a 100% blockage factor for any flood modelling associated with development applications in the CBD. This assumed blockage percentage will have a significant bearing on whether the proposed development will increase or decrease flood levels at the subject site.

The existing stormwater flows pond in front of the subject site and flow in a 600mm diameter pipe under the Dirrabirri Lane to the river. When the flows to the low point exceed the capacity of the pipe the water rises until it reaches the high point in Dirrabirri Lane and the high point in Willow Grove and flows overland around the subject site.

If the inlet to the 600mm diameter pipe is partially blocked, less water will get into the pipe and more water will have to flow overland to the river in the same storm event. This means that any blockage in the pipe will increase the depth of the flows around the subject site and the depth of ponding in front of the building. A 100% blockage will mean all the flows go overland and maximise the flood depths at the subject site.

The overland flow management strategy for the PPM is to increase the capacity of the pipe in Dirrabirri Lane and to provide a new pipe to take overland flows along the eastern side of the subject site. This will effectively increase the flow rate underground and reduce the flow rate overland. Molino Stewart are concerned that if the inlets to the pipes are 100% blocked then they will make no contribution to flood conveyance and will not reduce flood levels at the subject site. As it is proposed to increase the ground levels to the east of the subject site and if Dirrabirri Lane is increased in level, then overland flow water will need to pond to a higher level in Phillip Street and increase the flood levels for the subject site.

Requested Actions:

3a) Australia Unity support the provision of amplified stormwater pipes on either side of 32 Phillip Street site.

3b) The flood impacts of the final PPM design should be tested using City of Parramatta Council's more up to date, and peer reviewed, flood model when it becomes available to ensure that there will be no adverse flood impacts on the subject site or the surrounding public domain.

3c) The PPM project team should be requested to provide updated flood modelling accounting for an appropriate blockage percentage for stormwater pits.

3d) The civil design solution must not increase flood levels adjacent to 32 Phillip Street.

CONCLUSION

Thank you for the opportunity to provide this additional submission on the Parramatta Powerhouse (SSD-10416) Response to Submissions on behalf of Australian Unity, the landowners of 32 Phillip Street, Parramatta, which immediate adjoins the PPM site. This submission is written and should be read in conjunction with Australian Unity's original submission to the exhibition period in July 2020.

This submission has been informed by a detailed review of the Powerhouse SSDA RTS material exhibited on DPIE's website. **Importantly, Australian Unity supports the establishment of the PPM given the social, cultural and financial benefits that will be delivered to Parramatta and Western Sydney. However, Australian Unity are seeking design refinements that ensure better integration of the proposal within the surrounding Precinct.**

Prior to any determination of the SSDA by the Department, the critical concerns and requested actions identified in this Submission should be resolved, including:

- **Integration of both sites by an improved design outcome for the Civic Link**
- **Lack of certainty with operational and event management, as per the original submission; and**
- **Potential impact of increased flood affectation as a consequence of blockages to stormwater drains, as per the original submission.**

We would welcome the opportunity to meet with assessment officers from DPIE and the applicant (Infrastructure NSW) to discuss the content of this submission to ensure that all matters and concerns are taken into consideration in the determination of a prominent Government site.

Should you require additional information regarding this submission, please do not hesitate to contact me on 02 8233 9953.

Yours sincerely,

Murray Donaldson
Director, Planning
Urbis Pty Ltd
mdonaldson@urbis.com.au

APPENDIX A – GROUND PLANE DESIGN OPTIONS, PREPARED BY FITZPATRICK & PARTNERS

32 PHILLIP STREET

Parramatta, NSW

Ground Plane Options
Monday, 19 October 2020

fitzpatrick+partners

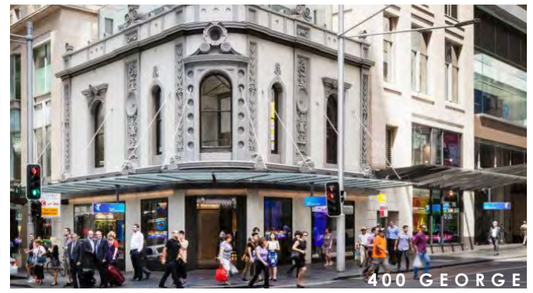
contents

PRECEDENTS
347 Kent + 400 George Street

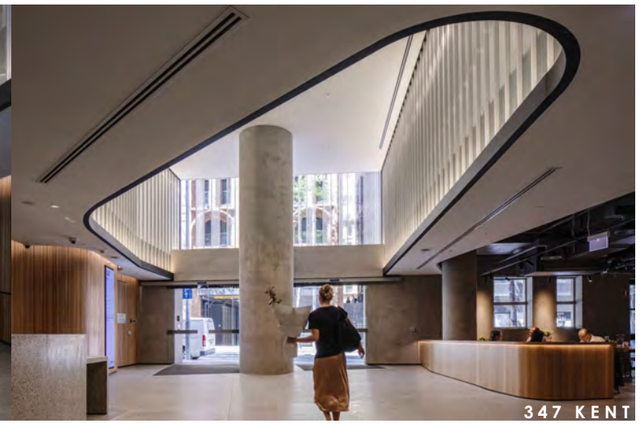
Heritage Conscious Street Frontage

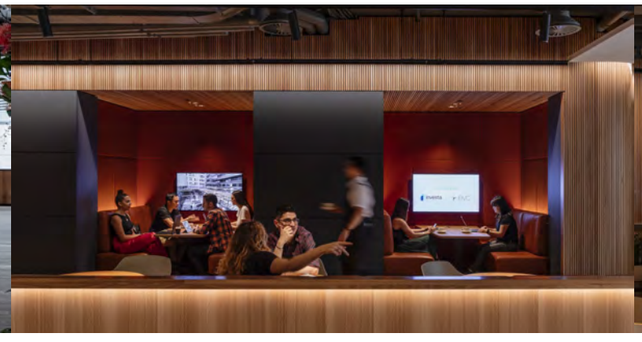
Internal Lobby Moves

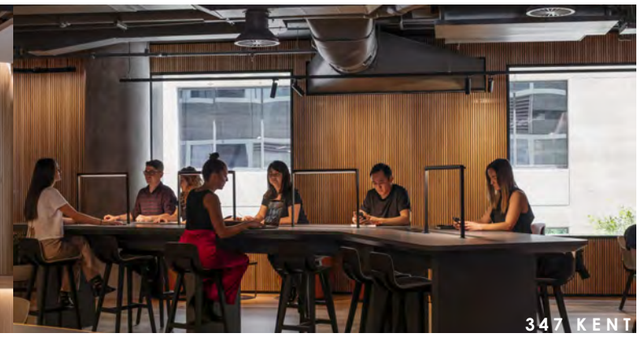
Lobby + Street Activation



Impromptu Meeting Space



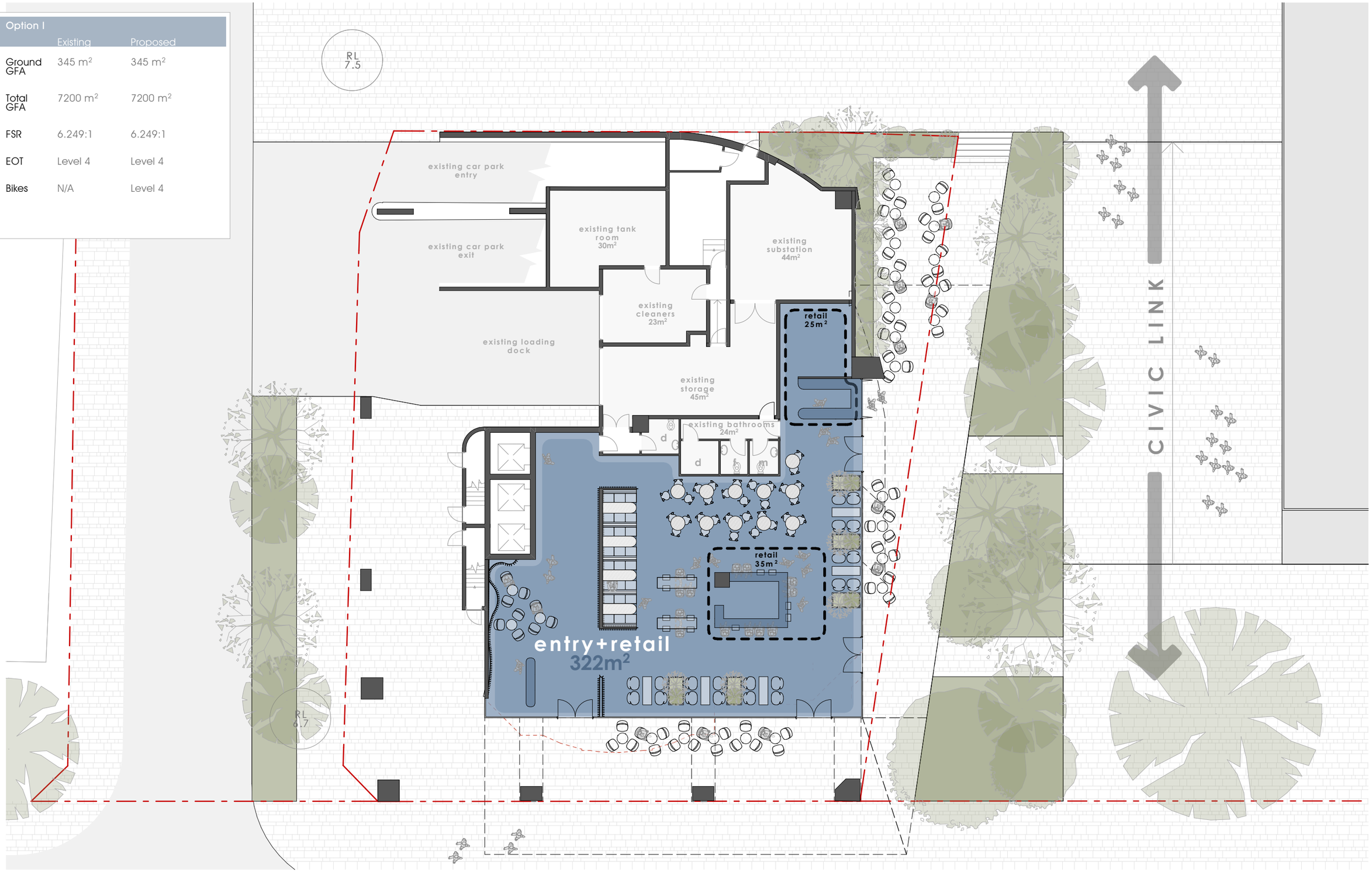




Option I
No Additional Area

GROUND REFURBISHMENT
Option I: No Additional Area

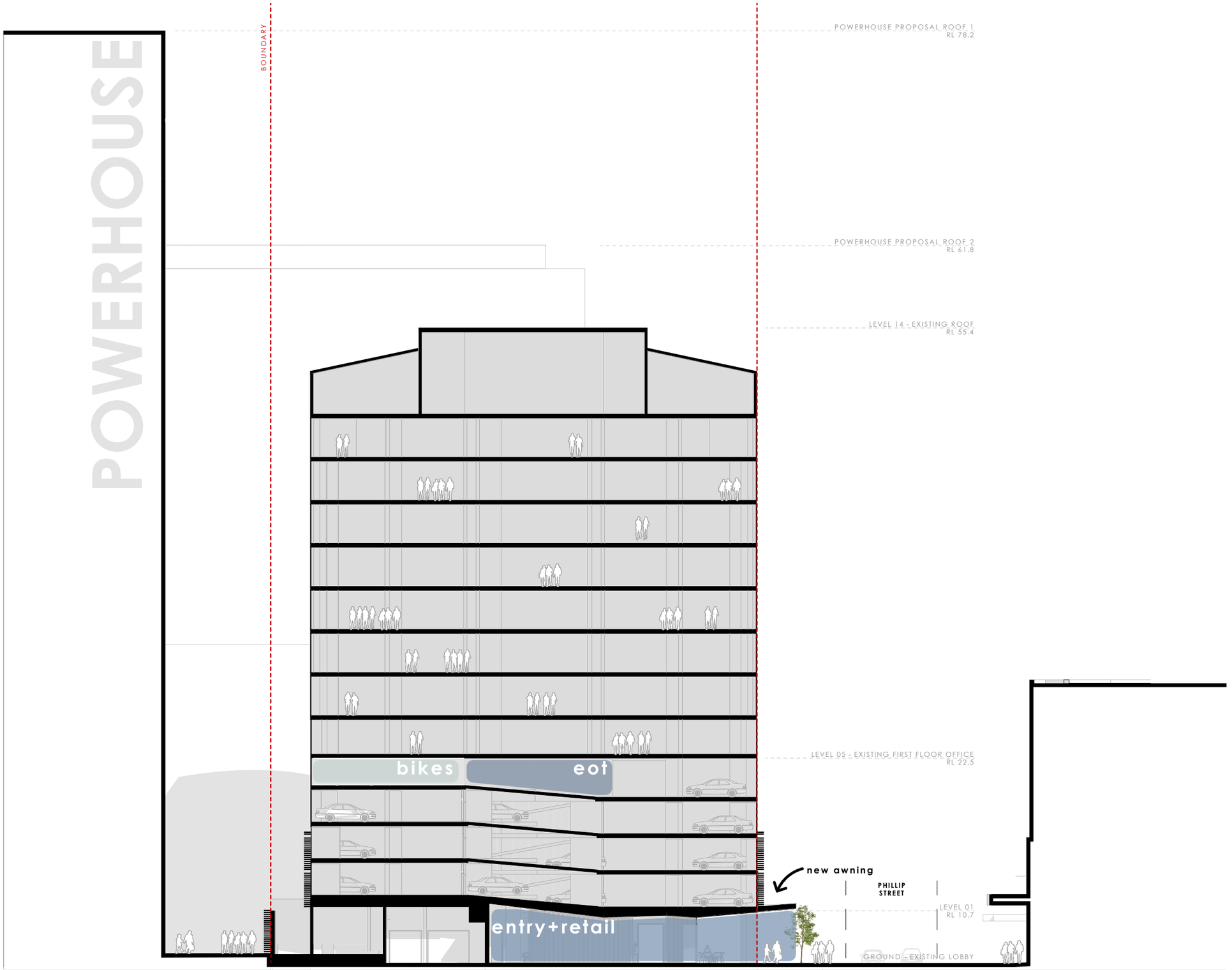
Option I	Existing	Proposed
Ground GFA	345 m²	345 m²
Total GFA	7200 m²	7200 m²
FSR	6.249:1	6.249:1
EOT	Level 4	Level 4
Bikes	N/A	Level 4



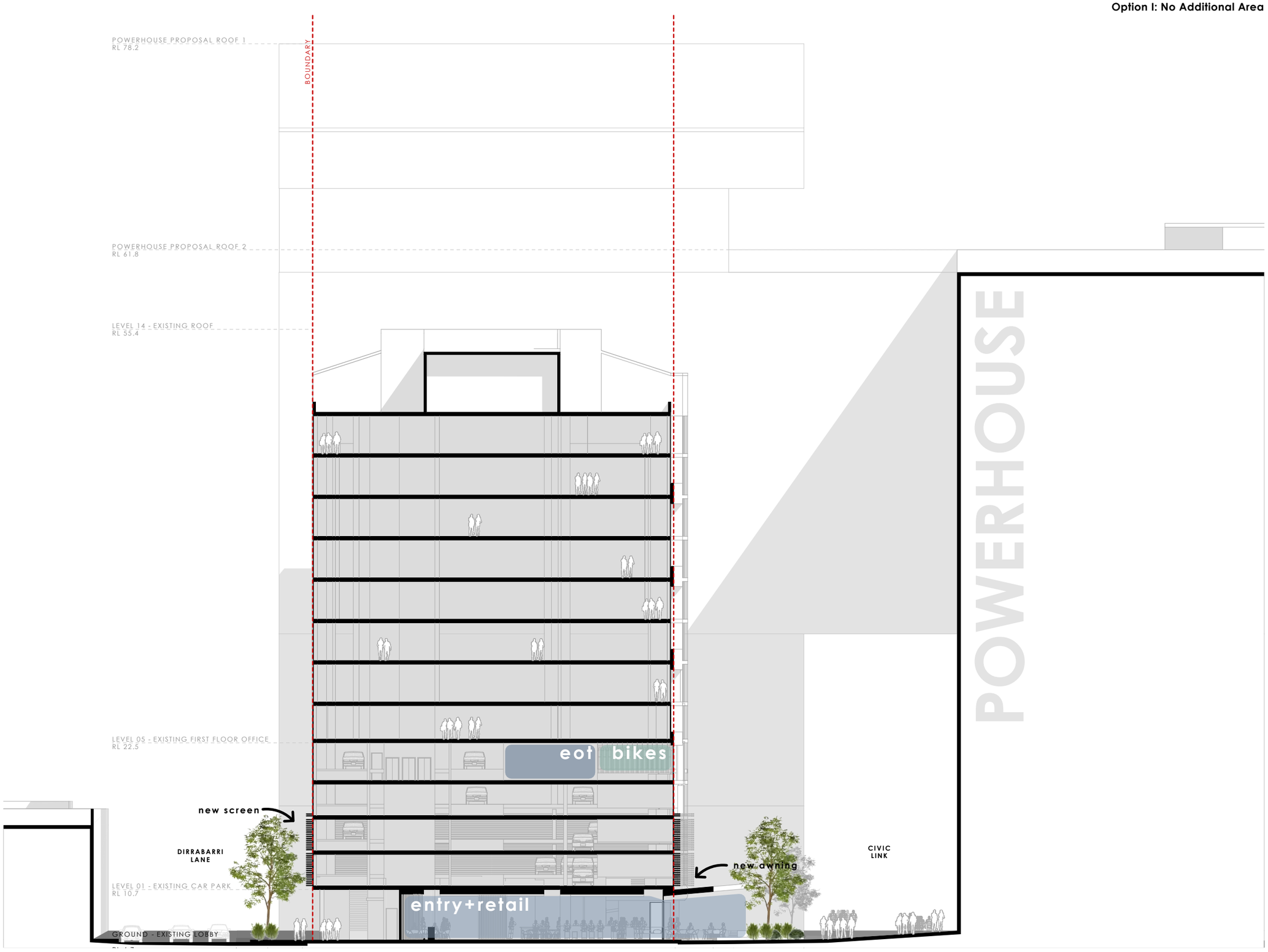
Ground Plane Options
1:200

LEVEL 4 END OF TRIP
Option I: No Additional Area

PHILLIP STREET ACTIVATION
Option I: No Additional Area



CIVIC LINK ACTIVATION
Option I: No Additional Area



VIEW FROM THE CIVIC LINK

VIEW FROM THE POWERHOUSE

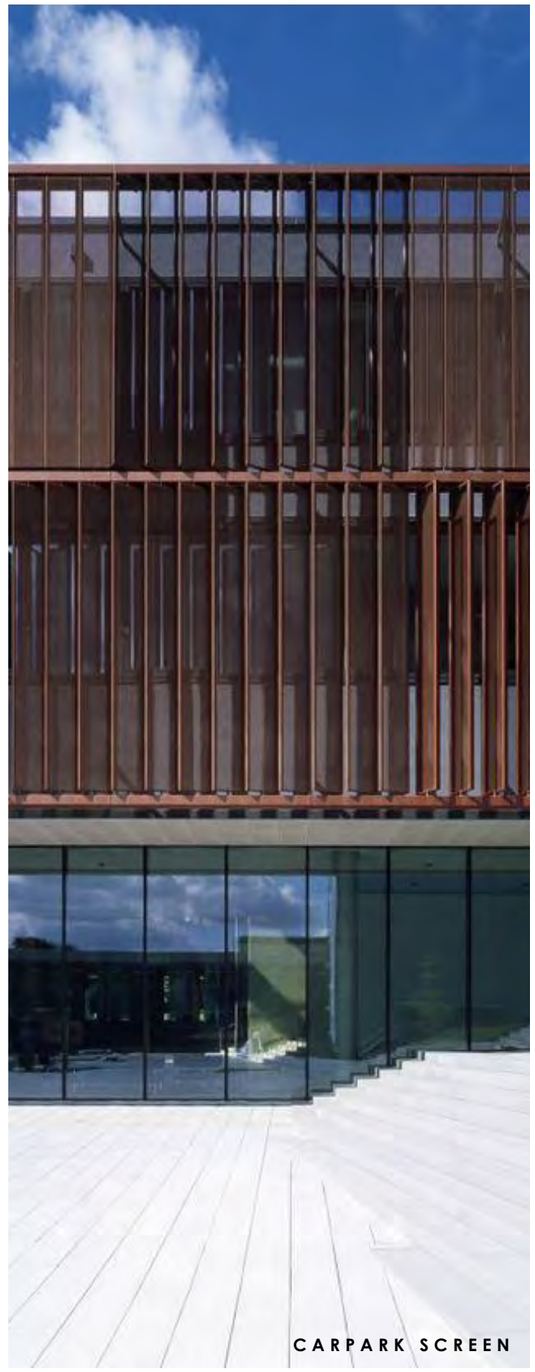
VIEW FROM PHILLIP STREET

VIEW FROM WITHIN


HIGH DESK COWORK SPACE

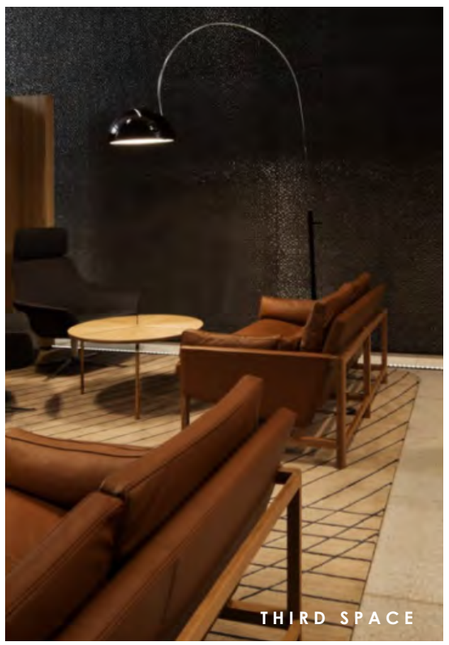

CONCIERGE


TIMBER BATTENS


CARPARK SCREEN


MATERIALITY

CAFE RETAIL

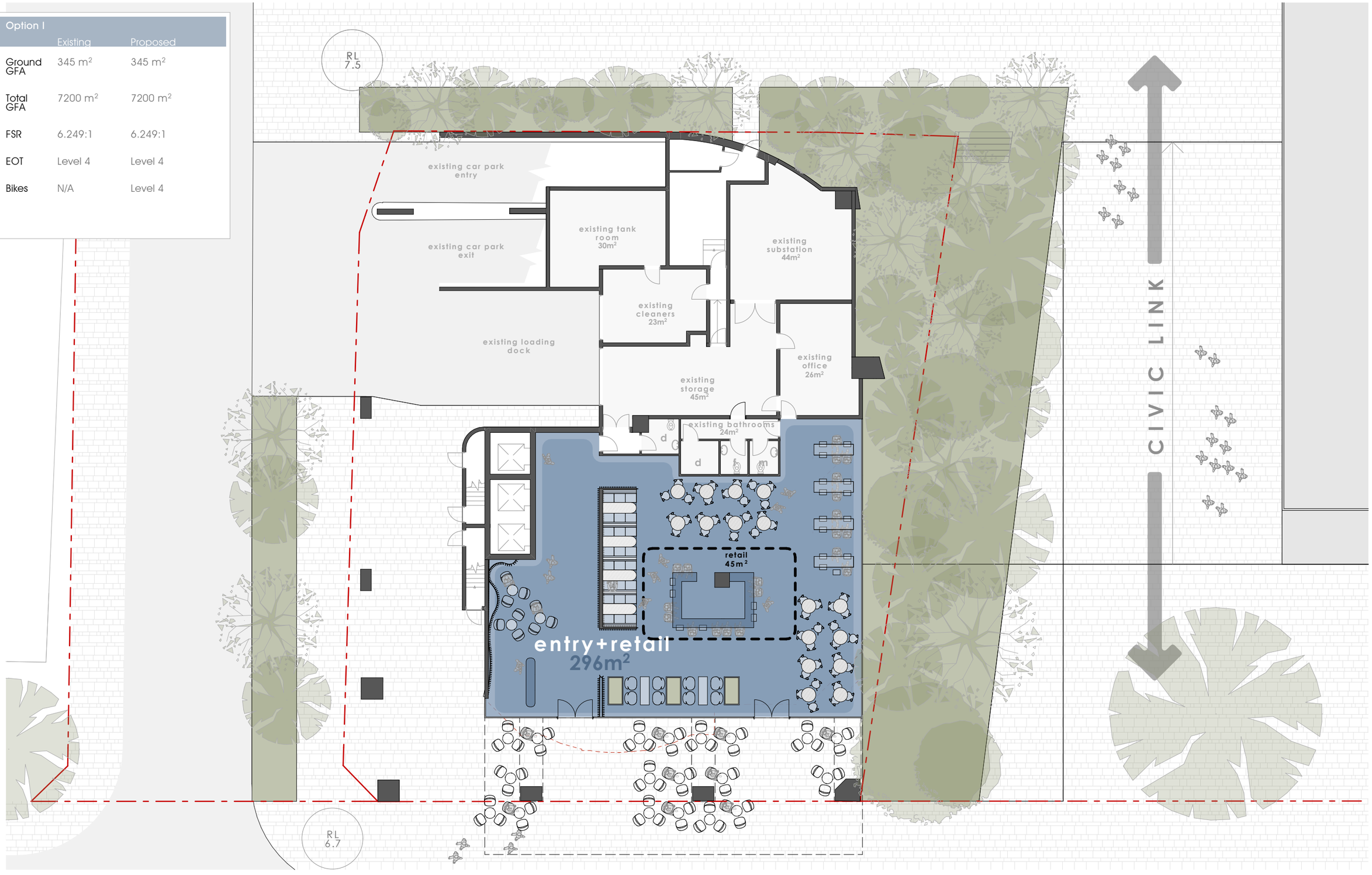

THIRD SPACE


COPPER AWNING

Option IA
No Additional Area
(Perimeter Landscape from Powerhouse)

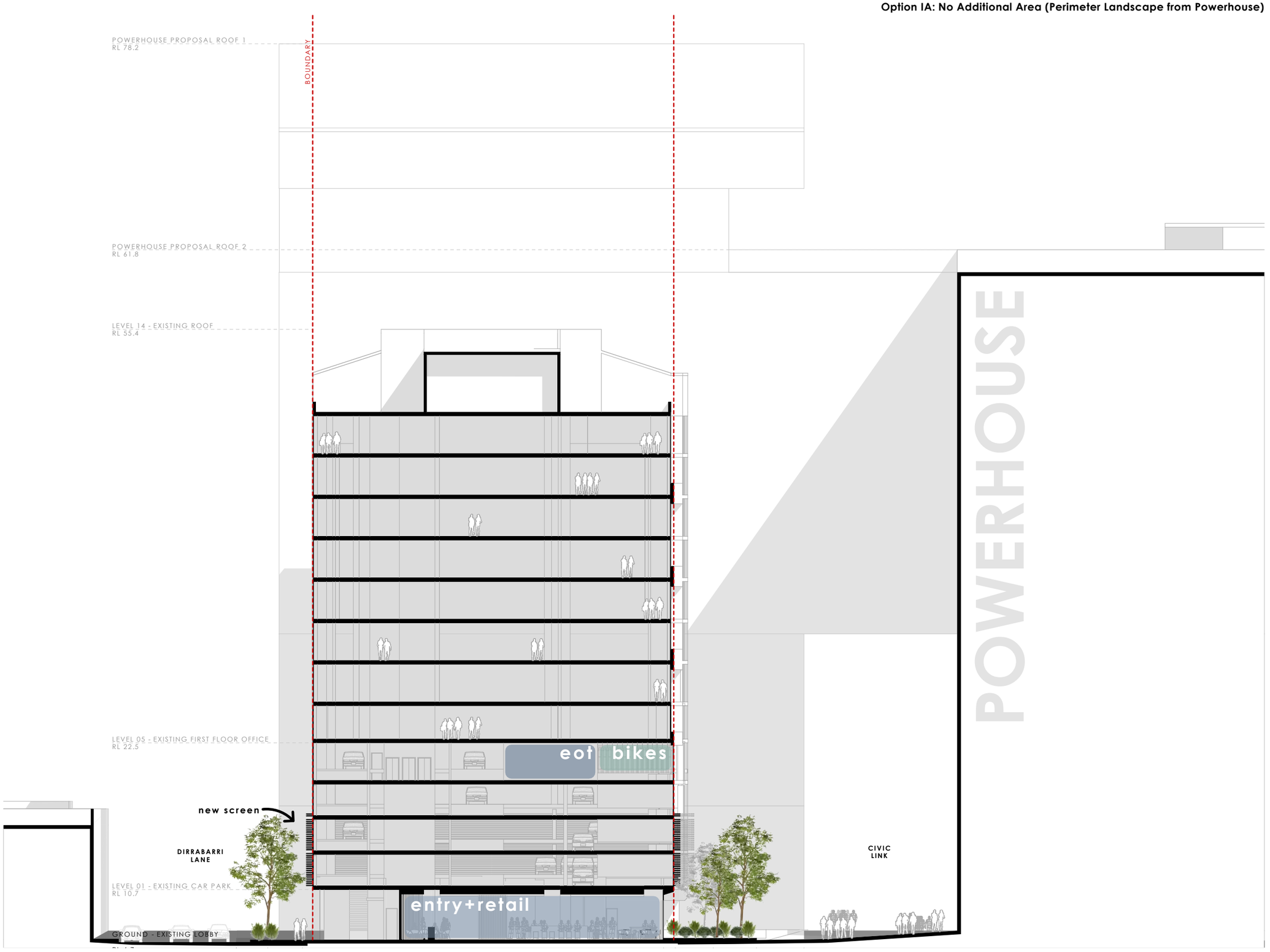
GROUND REFURBISHMENT
Option IA: No Additional Area (Perimeter Landscape from Powerhouse)

Option I	Existing	Proposed
Ground GFA	345 m²	345 m²
Total GFA	7200 m²	7200 m²
FSR	6.249:1	6.249:1
EOT	Level 4	Level 4
Bikes	N/A	Level 4



CIVIC LINK ACTIVATION

Option IA: No Additional Area (Perimeter Landscape from Powerhouse)



Ground Plane Options
1:300

SENSE OF SPACE

Option IA: No Additional Area (Perimeter Landscape from Powerhouse)

VIEW FROM THE CIVIC LINK

VIEW FROM THE POWERHOUSE

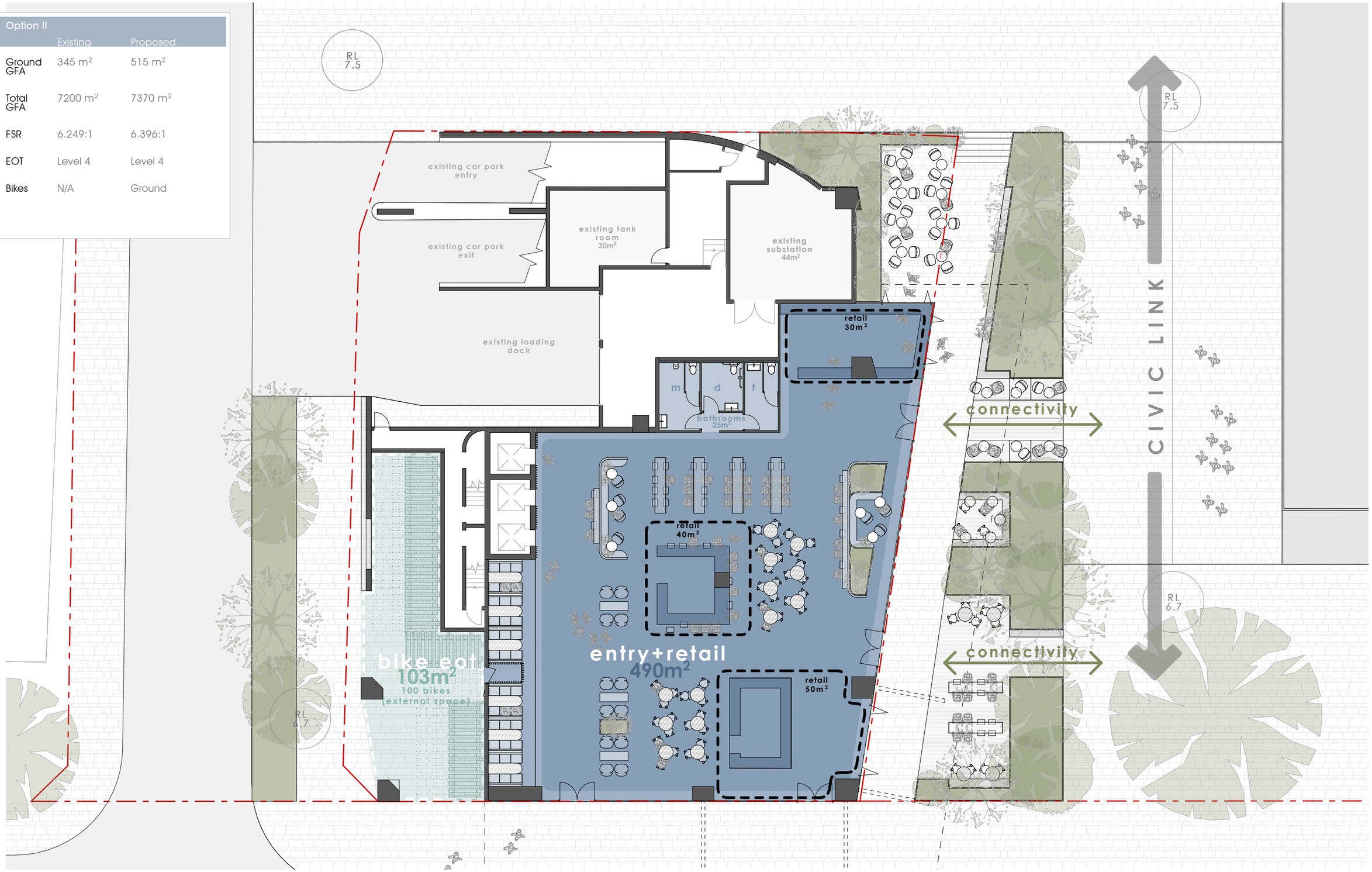
VIEW FROM PHILLIP STREET

VIEW FROM WITHIN

Option II
Additional Area

GROUND REFURBISHMENT
Option II: Additional Area

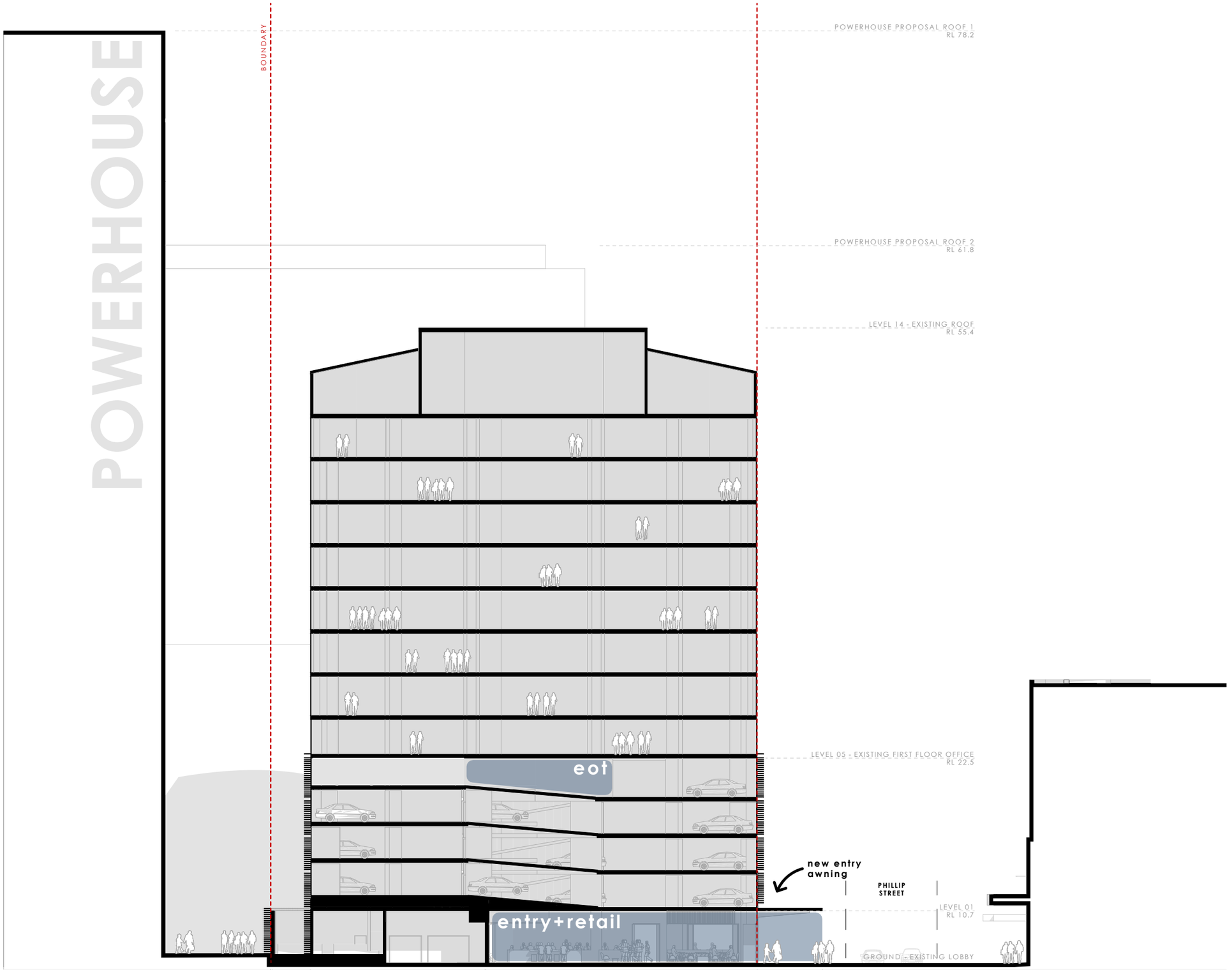
Option II	Existing	Proposed
Ground GFA	345 m²	515 m²
Total GFA	7200 m²	7370 m²
FSR	6.249:1	6.396:1
EOT	Level 4	Level 4
Bikes	N/A	Ground



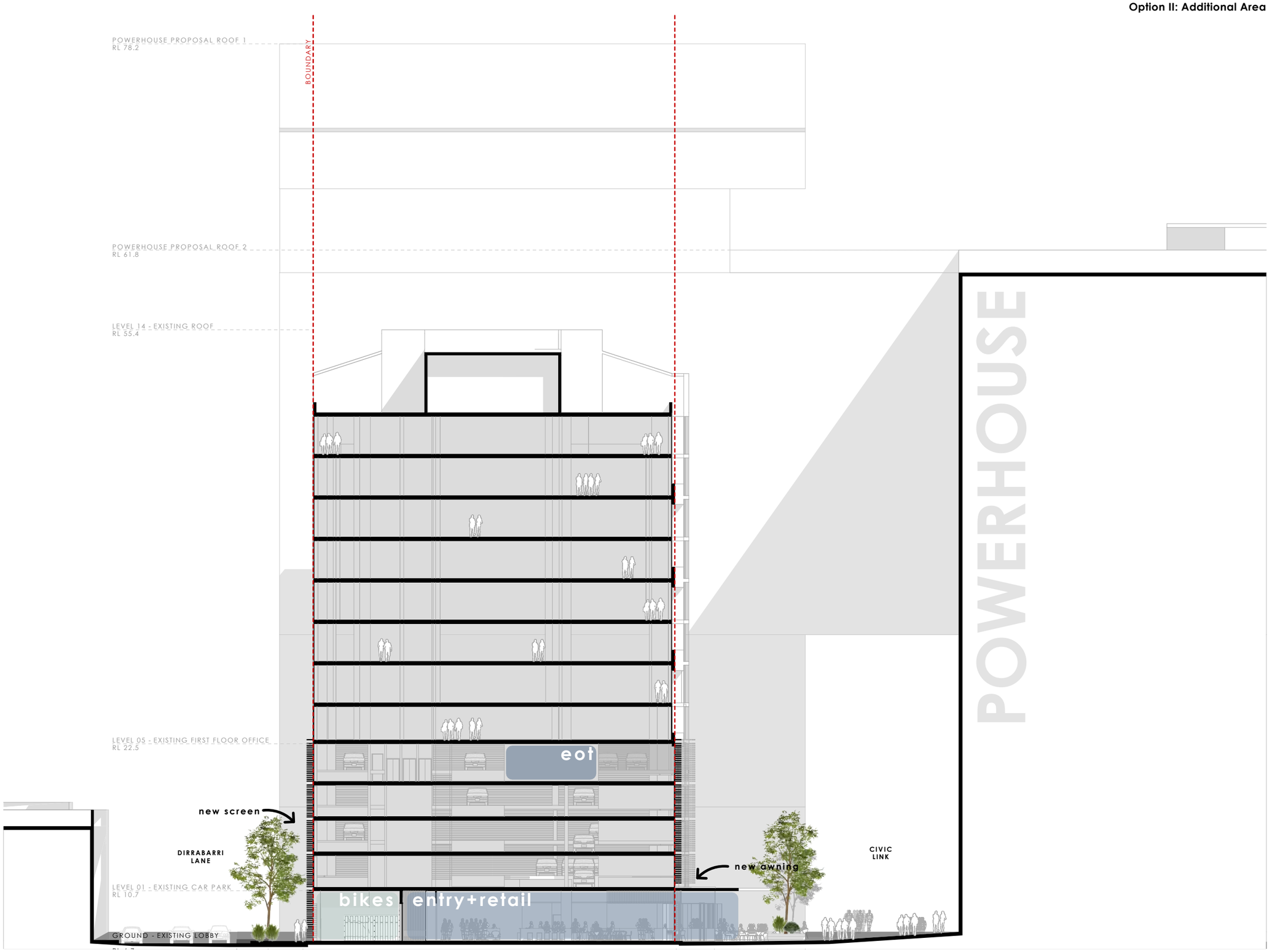
Ground Plane Options
1:200

LEVEL 4 END OF TRIP
Option II: Additional Area

PHILLIP STREET ACTIVATION
Option II: Additional Area



CIVIC LINK ACTIVATION
Option II: Additional Area



VIEW FROM THE CIVIC LINK

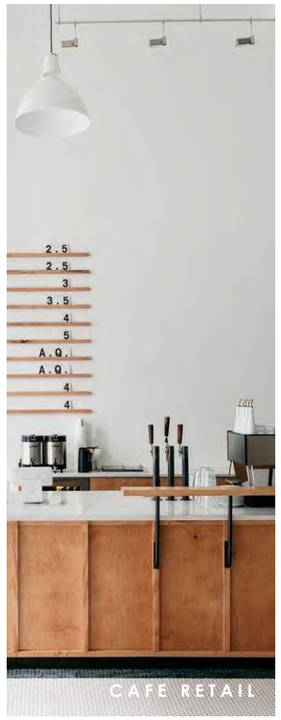
VIEW FROM THE POWERHOUSE

VIEW FROM PHILLIP STREET

VIEW FROM WITHIN


GLASS AWNING


THIRD SPACE



CAFE RETAIL


CARPARK SCREEN


MATERIALITY

CAFE RETAIL


HIGH DESK COWORK SPACE


TIMBER BATTENS

APPENDIX B – REVIEW OF FLOOD IMPACT ASSESSMENT PREPARED BY MOLINO STEWART

MOLINO STEWART
ENVIRONMENT & NATURAL HAZARDS

27/07/2020

Australian Unity
C/- Robert Teijeiro
Senior Project Manager
TSA
Level 15, 207 Kent Street
Sydney, NSW, 2000

Dear Robert,

Re:Powerhouse Museum EIS Review – Flooding and 32 Phillip Street

As requested, we have reviewed the Powerhouse Museum EIS and relevant technical appendices and this letter provides an overview of the proposed museum's implications for:

- any changes to flooding that may impact 32 Phillip Street - flow paths, flood levels, rates of flow and mitigation measures.
- the ability for the proposed public domain levels to be functional and integrated with existing and future development of 32 Phillip Street.
- the flood impact to meet Council's requirements and flood management policies.
- appropriate design responses and/or conditions to protect 32 Phillip Street from adverse flood impacts.

This report does not consider the appropriateness of the museum's design to manage flood risks to the museum, its collections or people on the museum site.

Nature of Flooding

Both the Powerhouse Museum site and 32 Phillip Street are affected by two types of flooding:

- Riverine flooding where the Parramatta River rises and overflows onto the sites
- Overland flooding where water which exceeds the capacity of the underground street drainage network runs through the streets and other open space areas between buildings on its way to the Parramatta River

While low lying parts of the museum site are affected by relative frequent floods in the Parramatta River, 32 Phillip Street is not affected by riverine flooding up to and including the 1% (1 in 100) average exceedance probability (AEP) flood. Both sites are affected by the probable maximum flood in the Parramatta River which reaches about 11m AHD and would be more than 4m deep at the car park driveway into 32 Phillip St.

Figure 20 from Appendix O of the EIS (reproduced on the next page as Figure 1) shows the stormwater drainage catchments and underground pipe network which drain through the museum site to the River. The smaller, middle catchment includes 32 Phillip Street which is a noticeable indent in the southern boundary of the museum site.

The figure also shows there is drainage in Horwood Place and on both sides of Phillip Street which feed into a 600mm diameter pipe which runs along Dirrabarri Lane before cutting through the at-grade car park at the rear of 32 Phillip and under the multideck carpark before discharging into the Parramatta River.

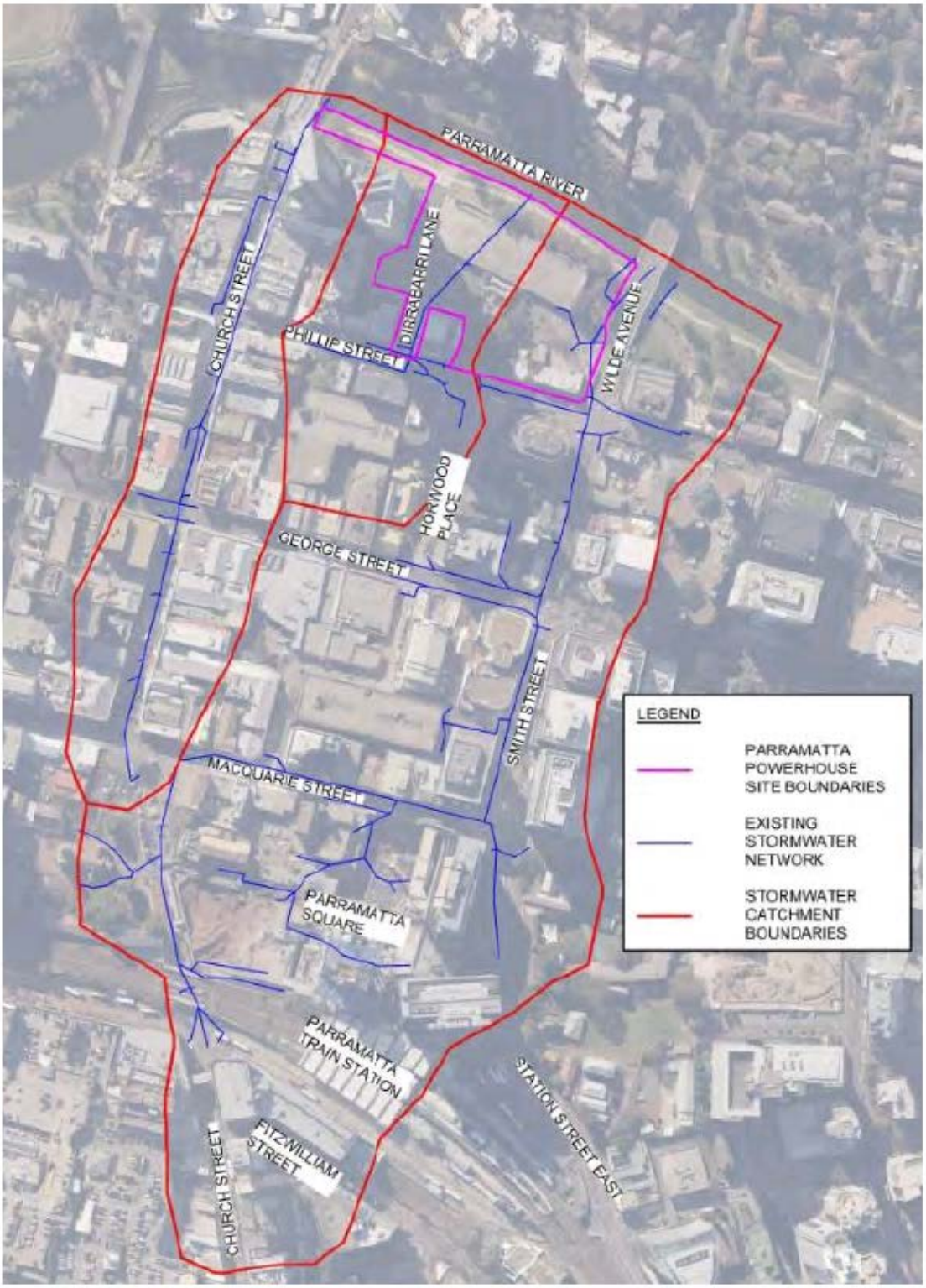


Figure 20: Existing stormwater drainage infrastructure catchment plan for areas in close proximity to the Powerhouse Parramatta development site

Figure 1: Stormwater Catchments and Pipes

Figure 2 shows that even in a 5% AEP overland flow event the underground pipe network is unable to take all of the flows. Because Dirrabarri Lane and Willow Grove are slightly higher than Phillip St, the water ponds in Phillip St. Once it has reached sufficient depth it flows around either side of 32 Phillip Street and into the at-grade car park at its rear. This is what happened on 9th February, 2020 and floodwaters entered the foyer of 32 Phillip Street.

It could be ponding up to 0.5m deep at the front of the building in a 5% AEP event. In the 1% AEP flood the water depths in front of 32 Phillip Street would be a little deeper. In the PMF the water could be up to 4.5m deep in front of 32 Phillip Street but this would be mainly controlled by the flood level in the Parramatta River which would only be about half a metre lower.

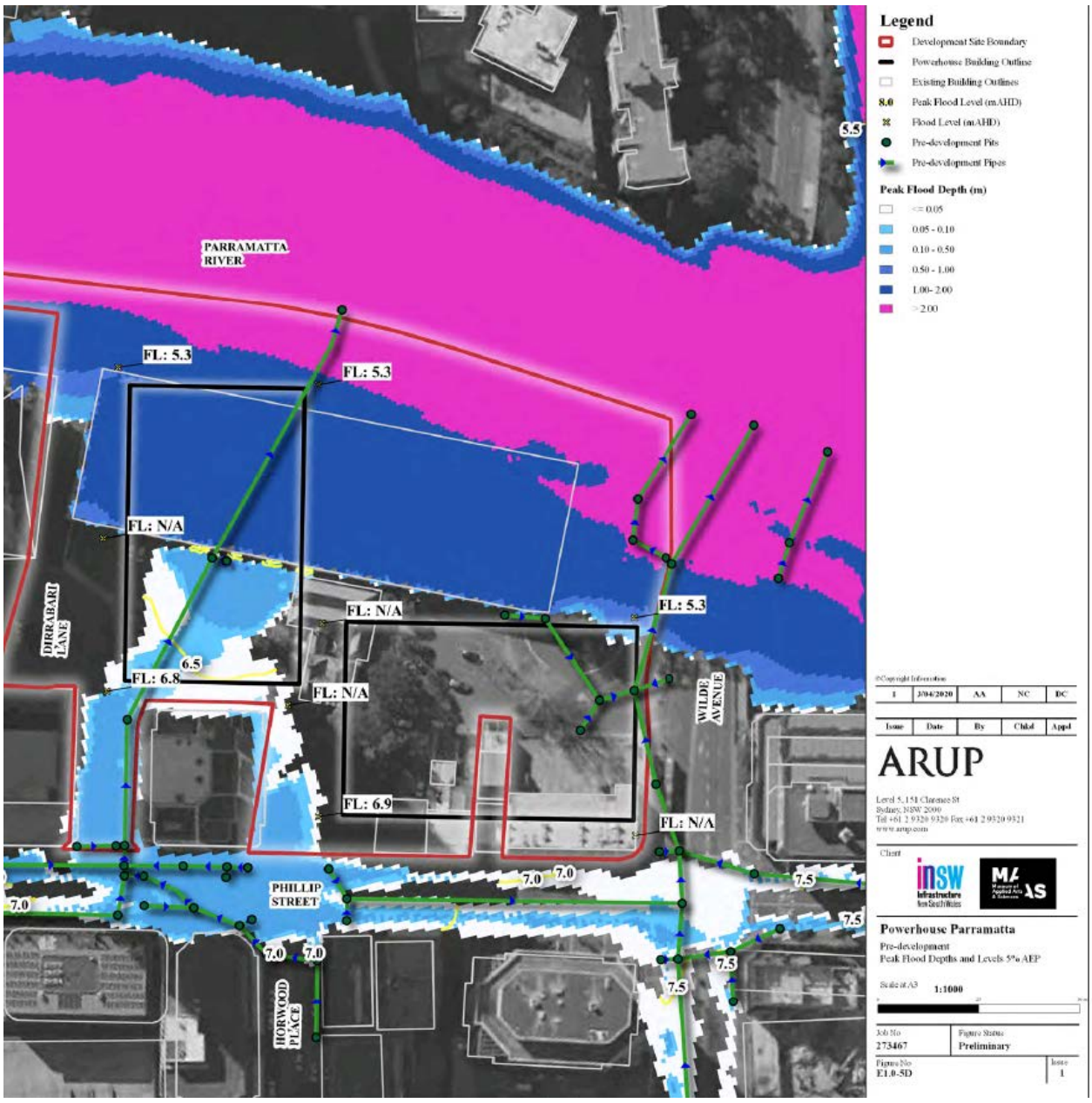


Figure 2: 5% AEP Flood Levels and Depths

Riverine Flooding Considerations

To ensure that the museum development does not obstruct riverine flows and increase flood levels on neighbouring properties, it is proposed to create an undercroft space under the museum's western building and contour the outdoor areas to provide the same flood conveyance and storage as currently exists.

As 32 Phillip Street is already above the 1% AEP flood levels in the Parramatta River, the museum development is unlikely to have any adverse impacts on 32 Phillip Street and the surrounding public spaces with regard to riverine flooding.

Overland Flooding Considerations

Figure 3 shows how the museum development proposes to manage overland flows and the impacts on overland flows in a 1% AEP event.. The existing 600mm diameter pipe which currently runs under Dirrabarri Lane and the multideck carpark will be replaced by a 1200mm diameter pipe running under Dirrabarri Lane and heading directly north to the river. Then on the eastern side of 32 Phillip Street a new 600mm pipe will be laid to take water directly to the river between the two museum buildings.

As can be seen in Figure 3, these measures would eliminate flooding to the immediate east and north of 32 Phillip Street and slightly reduce levels in Phillip Street and Dirrabarri Lane in a 1% AEP event.

Limitations

The preceding commentary is premised on the assumption that the flood modelling for the museum is adequate and the results presented in the EIS are accurate. I have in no way reviewed the adequacy of the modelling.

However, I note that Appendix O does compare the model results in the Parramatta River with the levels currently adopted by Council and those foreshadowed in a more up to date model currently being prepared for Council. The discrepancies are minor and, given that the 1% AEP level in the river is below the level of 32 Phillip Street, such discrepancies are not likely to have any implications for 32 Phillip Street.

No such comparison is presented in Appendix O for the overland flows but it is logical that by providing more underground pipe capacity on either side of 32 Phillip Street the current situation can only be improved. However, an important consideration in overland flow modelling is the assumed blockage of pipes and inlet structures. Appendix O claims to have included appropriate blockage factors for stormwater pits in the flood modelling but does not state what those factors are.

It is important to know what blockage factors have been adopted in the modelling for the following reason.

The existing stormwater flows pond in front of 32 Phillip Street and flow in a 600mm diameter pipe under Dirrabirra Lane to the river. When the flows to the low point exceed the capacity of the pipe the water rises until it reaches the high point in Dirrabirra Land and the high point in Willow Grove and flows overland around 32 Phillip Street.

If the inlet to the 600mm diameter pipe is partially blocked, less water will get into the pipe and more water will have to flow overland to the river in the same storm event. This means that any blockage in the pipe will increase the depth of the flows around 32 Phillip Street and the depth of ponding in front of the building. A 100% blockage will mean all the flows go overland and maximise the flood depths at 32 Phillip Street.

Furthermore, the overland flow management strategy within the Powerhouse Museum design is to increase the capacity of the pipe in Dirrabirra Lane and to provide a new pipe to take

overland flows along the eastern side of 32 Phillip Street. This will effectively increase the flow rate underground and reduce the flow rate overland. However, if the inlets to the pipes are 100% blocked then they will make no contribution to flood conveyance and will not reduce flood levels at 32 Phillip Street. In fact, if the level of Dirrabirra Lane is proposed to be raised, and it is certainly proposed to increase the ground levels to the east of 32 Phillip Street, then the water will need to pond to a higher level in Phillip Street and increase the flood levels for 32 Phillip Street.

I, and most flood modellers, do not think it reasonable to assume that the pipes will be 100% blocked but you can see that knowing the assumed blockage percentage will have a significant bearing on whether the proposed development will increase or decrease flood levels at 32 Phillip Street. If the same blockage percentage is assumed in the pre and post development modelling then that should not be a problem if the assumed blockages are reasonable.

Where a problem may arise is when a future development proposal is submitted for the redevelopment of 32 Phillip Street. It is my experience that Parramatta City Council requires flood modelling associated with development applications in the LGA to assume a 100% blockage of all stormwater inlets. If this is done then the flood planning level at 32 Phillip Street would be higher than has been assumed for the museum and in fact, because the museum has assumed some flow in the pipes to counter the increased ground level but Council will assume no flow in the pipes, the museum development will have effectively increased the flood planning level for 32 Phillip Street by virtue of the different flood modelling assumptions acceptable to the State Government versus Parramatta Council.

A more reliable overland flow solution for 32 Phillip Street, and one which Council would insist on were it the consent authority for the museum development, would be to lower the ground levels to the east and west of 32 Phillip Street so that there is less impediment to flow between the street and the river.

Conclusions and Recommendations

The proposed museum development is unlikely to have any adverse impact on 32 Phillip Street with regard to riverine flooding up to the 1% AEP flood level. In this regard the proposed museum design responses to flooding on and near the site meets the requirements of Parramatta City Council's flood management policies in that it does not increase the flood risks off site, as far as can be ascertained from the model results presented.

It should also theoretically not have an adverse impact on overland flood levels at 32 Phillip Street because it proposes to increase the capacity of underground pipes on either side of the building to counteract the increase in ground levels that it will create. The modelling in the EIS suggests that it will actually slightly decrease the overland flood levels at 32 Philip Street and make it flood free on its northern and . The effectiveness of this as a design solution will depend on the degree to which the pipe inlets can get blocked and the EIS and Appendices are silent on what has been assumed in the modelling.

What is more complicated is the potential divergence in the way the NSW Government and Parramatta City Council may consider inlet and pipe blockage in overland flood models. While the State Government may accept the blockages assumed in the overland flood modelling for the museum development, Council is likely to expect an assumed 100% blockage for the redevelopment of 32 Phillip Street. This would mean that 32 Phillip Street would be penalised financially because of the different treatment by the two consent authorities of the proposed overland flow management solution for the museum.

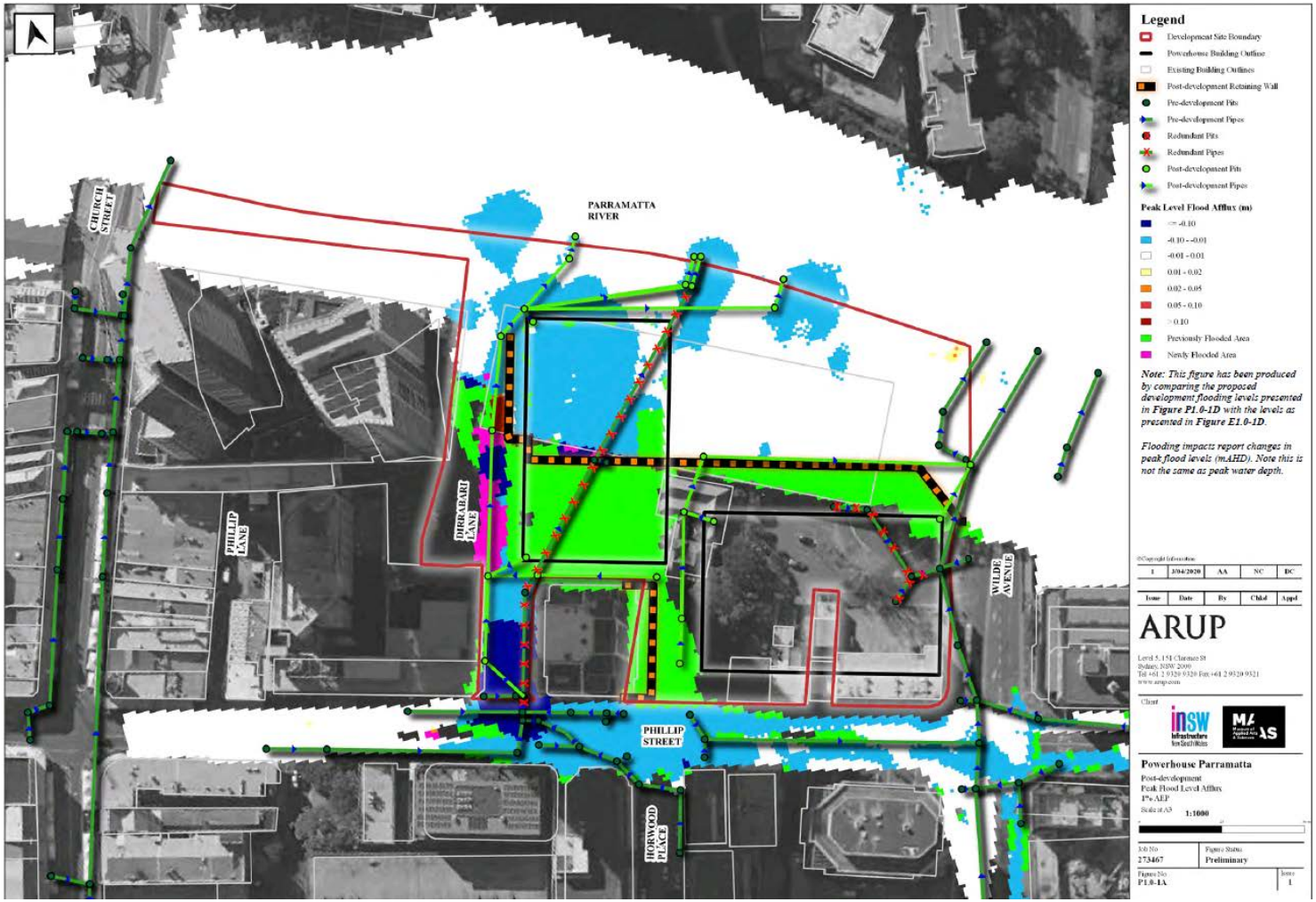


Figure 3: Proposed Design Responses to Manage Overland Flows

Therefore, to protect the commercial interests of the owners of 32 Phillip Street, it is recommended that:

- the provision of amplified stormwater pipes on either side of 32 Phillip Street be supported
- the flood impacts of the final museum design be tested using Council's more up to date, and peer reviewed, flood model when it becomes available (probably late 2020) to ensure that there will be no adverse flood impacts on 32 Phillip Street or the public spaces immediately surrounding it.
- when the detailed design and updated flood modelling is undertaken that the design solution be one which does not increase flood levels adjacent to 32 Phillip Street and is unlikely to do so even were there to be 100% inlet or pipe blockage.

Yours faithfully

For Molino Stewart Pty Ltd

Steven Molino

Principal

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