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Cockle Bay Park Landbridge over the Western Distributor

Landbridge Design Principles

DPT and DPPT Operator Pty Ltd

21 September 2017

Revision: 2

Reference: 253427

Bringing ideas to life

Document control record

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1 Introduction

This report supports the Response to Submissions from Roads and Maritime Services (RMS) in relation to the proposed landbridge over the Western Distributor and amended Concept Proposal associated with a State Significant Development Application (SSDA 7684) submitted to the Minister for Planning and Infrastructure pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

DPT Operator Pty Ltd and DPPT Operator Pty Ltd (the Proponent) are seeking approval for a Concept Proposal for the redevelopment of the Cockle Bay Wharf Building and the surrounding area to create new open space and a commercial, retail and tourist precinct in the heart of the CBD (now referred to as Cockle Bay Park). The amended Concept Proposal includes:

- a large area of publicly accessible open space;
- new retail outlets, including new food and beverage destinations;
- new cultural and entertainment destinations; and
- a new commercial office tower.

The project will add new open space to the Sydney CBD and help to reconnect the city to the Darling Harbour waterfront. Cockle Bay Park will take its place in a revitalised Sydney CBD and speaks directly to local government objectives to create a 'Green, Global and Connected City' (City of Sydney) as well as the strategic vision outlined in 'Towards Greater Sydney 2056' to grow the "developing central city". The vision for this project was developed with consideration for the NSW Government objectives to support and "grow the knowledge industry", double tourism expenditure and "strengthen our local environment and communities" as outlined in 'NSW 2021: A Plan to Make NSW Number One'.

Please note that all plans, diagrams, images and graphics within this report and the supporting documentation (excluding the amended Concept Proposal Envelope Plans prepared by Francis-Jones Morehen Thorp Pty Ltd) are indicative only and have been included to communicate the intent of the amended Concept Proposal, including representative building shapes, forms, locations, layouts and relationships. It is proposed that these representations, together with acceptance of the building envelopes and massing, and associated design principles, will then be used to inform the Design Excellence process to follow the Stage 1 SSD Determination. Design Excellence outcomes will form the basis of the Stage 2 SSDA.

As part of this redevelopment a new landbridge structure over the Western Distributor has been proposed. The landbridge will facilitate improved pedestrian accessibility from the Sydney CBD to Darling Harbour, removing the existing 'barrier' of the Western Distributor. It will also create significant new public open space and parkland.

The landbridge would create a partial enclosure to the elevated northbound Western Distributor and southbound Market St towards Anzac Bridge, and the on grade northbound and southbound Western Distributor and northbound Wheat Rd.

This report addresses the interaction and effects of the landbridge and its associated elements with the Roads and Maritime Services (RMS) network. This is in response to comments provided by RMS to the State Significant Development Application SSD7684 which has been included in Appendix A for reference.

Broadly speaking, the comments relate to:

- Proposed landbridge pier positions in relation to the road network and the subsequent protection of future road corridors;
- Continued anytime access to the road network for maintenance, repair, demolition or replacement;
- Fire safety;
- Air quality;
- Security
- Structural integrity;
- Constructability; and
- The configuration of Wheat Rd and traffic flows around the development.

2 Site Description

The Site is located within Darling Harbour. Darling Harbour is a 60 hectare waterfront precinct on the south-western edge of the Sydney Central Business District that provides a mix of functions including recreational, tourist, entertainment and business.

The Site is located to the immediate south of Pyrmont Bridge, within the Sydney CBD on the eastern side of the Darling Harbour precinct. The Site is also located within the City of Sydney local government area (LGA). A locational context area plan and location plan are provided at Figure 1 below.

The project Site area has been slightly amended by this Response to Submissions, a comparison of the exhibited and now-proposed Site area is provided as Figure 2, and the now proposed Site area is shown below as Figure 3.

The Darling Harbour precinct is undergoing significant redevelopment as part of the SICEEP, Darling Square, and IMAX renewal projects. The urban, built form and public transport / pedestrian context for the proposed Harbourside development will fundamentally change as these developments are progressively completed.

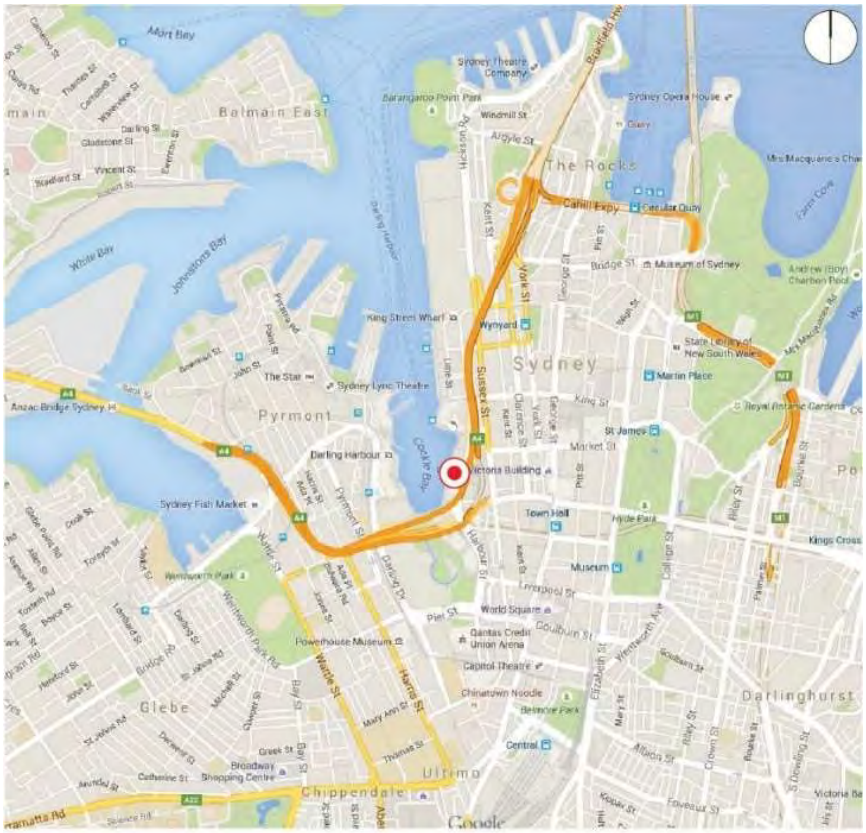


Figure 1: Location Context Area Plan

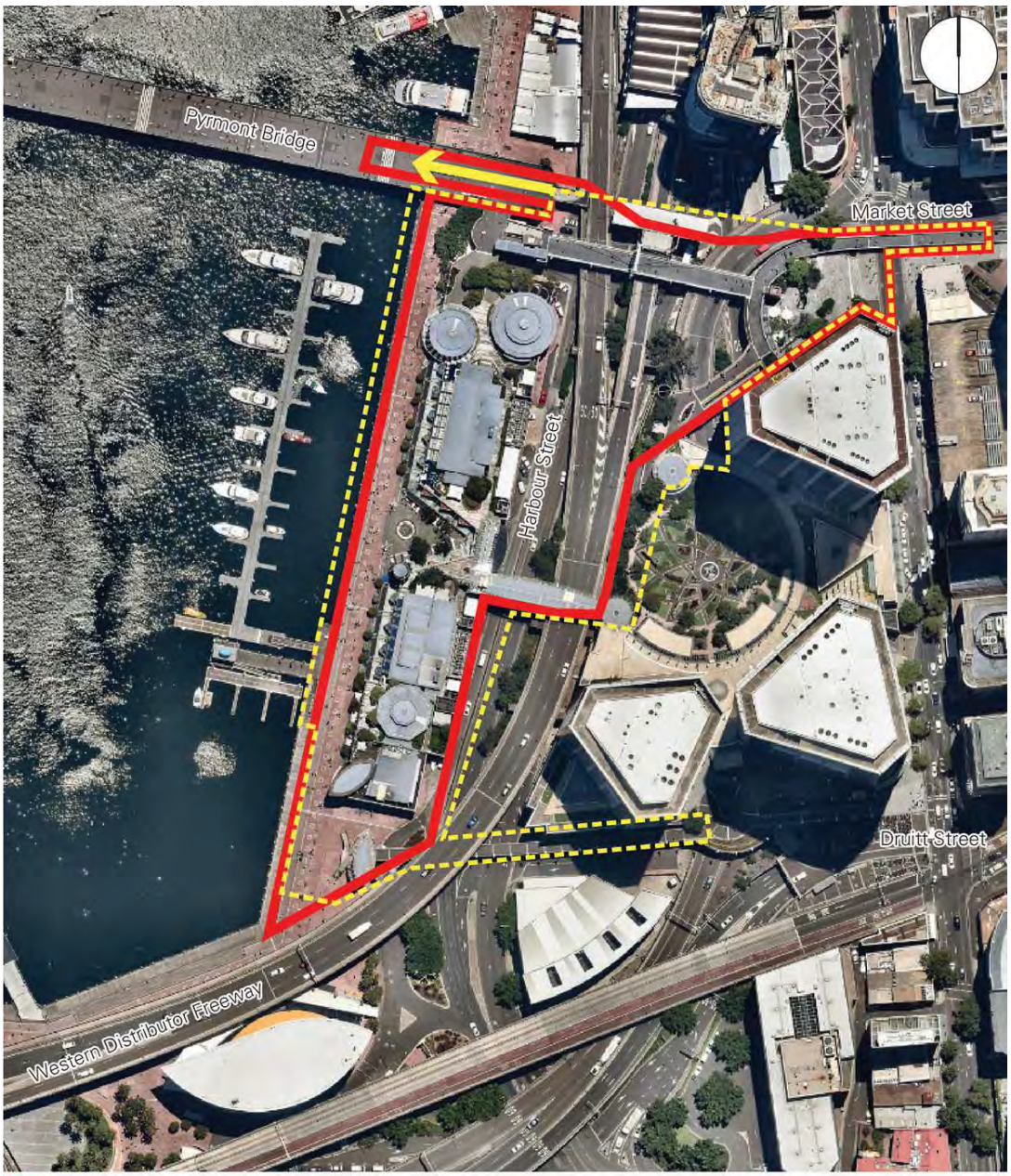


Figure 2: Location Plan (revised site area in yellow)

Figure 3: Location Plan (revised site area in yellow)

3 Items for Consideration

The follow subsections highlight the key considerations and outcomes for each of the nominated items which have an effect on the existing and future road network. The supporting drawings and documentation can be found in the referenced appendices.

3.1 Proposed Pier Positions and Protection of Future Road Corridors

3.1.1 Key Considerations

In order to give consideration to all matters effecting the current and future status of the existing road network – in particular those discussed within this report – locations of new piers supporting the landbridge need to be determined. In addition, in order to maximise the future flexibility of the road network, varying structural options for pier locations have been presented.

3.1.2 Key Outcomes

The following options have been investigated and presented within this report:

- The original "piers" option which features piers between the on-grade northbound Harbour Street and the elevated Western Distributor. Refer to Appendix B.
- The proposed new alternative "no piers" option which eliminates the piers between the elevated Western Distributor and the northbound Harbour Street. Refer to Appendix C. This provides the future flexibility to add a third lane to the Western Distributor and remove one lane of Harbour Street. This "no piers" option is proposed to be the adopted scheme for the development.

The piers have been positioned on the basis of the drawing included in Appendix D. This drawing indicates the available structural zones, informally agreed with RMS, that have been determined in conjunction with the existing road network and potential RMS projects for future road corridors. Once construction is complete, these locations will be outside the road barriers.

3.2 Maintenance, Repair, Demolition and Replacement of the Western Distributor

3.2.1 Key Considerations

Within RMS' comments to the development application (included within Appendix A of this report), the requirement to be able to access the existing roadway infrastructure is emphasised. The requirements are well summed up in the comment below within the section of comments dedicated to issues which require consideration, assessment and resolution before the development application should be determined.

> *"**Access for Maintenance and Repair –** the proponent will need to be able to demonstrate to Roads and Maritime satisfaction that the Podium will not unreasonably interfere with Roads and Maritime ongoing ability to access the Western Distributor and its surrounds for the purposes of maintenance, repair, augmentation and, if necessary, replacement of the Western Distributor."*

The Western Distributor is a key part of the Sydney road network and it is vital that the ability to maintain it is not compromised. The project team has undertaken a review of the impact of the proposed development on the accessibility of the existing infrastructure.

3.2.2 Key Outcomes

- In consultation with RMS, the intent of clearance to the elevated Western Distributor has been developed and is presented in Appendix E of this report. These minimum clearances will enable the inspection and maintenance requirements of the road network to be carried out to the same degree that they are currently undertaken.
- Inspection, maintenance or replacement of the Western Distributor bearings at joint locations is unaffected by the development. This is demonstrated in the diagrams in Appendix F of this report.
- The diagrams provided in Appendix G present one potential methodology for the demolition and replacement of the Western Distributor after the construction of the development's landbridge. They show that the construction of the landbridge does not unreasonably interfere with the ability to replace the existing infrastructure should that be required in the future. By implication, the same would apply to modifications that may be required to the existing infrastructure without complete demolition.

3.3 Fire Safety

3.3.1 Key Considerations

With the addition of the landbridge over the top of the road network, a cavernous enclosure with portals at either end is created. This has the effect of altering the impact of a fire event that may occur over the portion of the roadway proposed to be covered by the landbridge. The tenability of the modified space for road users as well as the modified effects of a fire event on the road network and surrounding infrastructure needs to be assessed in an appropriate way.

3.3.2 Key Outcomes

In consultation with RMS, a concept design criteria has been developed to guide the next stage of design development and demonstrate an appropriate minimum level of fire safety below the landbridge and in the surrounding area. This criteria is included as part of Appendix H.

3.4 Air Quality

3.4.1 Key Considerations

The addition of the landbridge over the top of the road network requires that an air quality assessment be undertaken in order to demonstrate that the vehicle emissions are adequately dispersed to a level that provides an air quality within an acceptable standard.

3.4.2 Key Outcomes

A precinct wide air quality assessment report has been undertaken by Pacific environment. The report is titled 21532 Cockle Bay Park Precinct Air Quality Assessment. Part of this report is an assessment of the air quality within the enclosure below the landbridge. It demonstrates that a compliant level of air quality is maintained within the enclosure created by the landbridge via means of natural ventilation alone. The assessment has been undertaken on the basis of the internal air quality concept design criteria that has been developed in consultation with RMS and included in Appendix H of this report.

3.5 Security

3.5.1 Key Considerations

It is important to ensure that the development does not pose an unacceptable security risk and that appropriate controls regarding monitoring, security and safety of users of the space are provided where necessary.

3.5.2 Key Outcomes

In consultation with RMS, it has been proposed that the project team undertake a Crime Prevention Through Environmental Design (CPTED) assessment of the existing area as well as in the context of what is being proposed for the whole redevelopment precinct. Out of that assessment would come a report outlining the traffic monitoring, public safety, crime prevention theories and the assessment methodology, as well as the findings and recommendations resulting from the review. These recommendations would be developed in consultation with RMS, Transport for NSW, Sydney Metro, Property NSW, emergency services and the co-owners during the stage 2 SSDA Application process. This approach has been outlined in the concept design criteria included in Appendix H and is to be undertaken in subsequent design development stages.

3.6 Structure

3.6.1 Key Considerations

The design of the landbridge structure and its supporting elements needs to be to a standard appropriate for the design requirements of the Western Distributor such that the integrity of the Western Distributor is maintained. The new development must also consider proposed future rail corridors for the area.

3.6.2 Key Outcomes

In consultation with RMS, a concept design criteria has been developed for the structure immediately adjacent and over the Western Distributor. This criteria is included as part of Appendix H.

A review of proposed rail corridors has been undertaken and the new development structures are not within the zone of influence of the future corridors.

3.7 Constructability

3.7.1 Key Considerations

Construction of the landbridge will require access to the Western Distributor for construction and materials handling. Some closures of the Western Distributor will be necessary. A preliminary programme has been included in Appendix I.

3.7.2 Key Outcomes

Construction planning has been developed to minimise closures of the Western Distributor. Pier and column locations have been located and can be constructed with minimal lane closures.

The installation of precast girders and concrete decks over the road network will require night time closures for a period. Detailed programming and coordination of times and durations will be agreed through preparation and approval of the Works Authorisation Deed.

3.8 Wheat Rd Configuration and Traffic Flow around the Development

3.8.1 Key Considerations

The development shall enable safe and efficient vehicle access throughout its life cycle without unreasonably interfering with the existing traffic flows. Any proposed modifications are to be compatible with the approved changes for the adjacent IMAX Theatre redevelopment.

3.8.2 Key Outcomes

The existing traffic arrangement associated with the site and its interactions with other developments (including the IMAX Theatre redevelopment project) and RMS or State Owned Corporation assets has been reviewed. Arising out of that review, a number of opportunities and solutions have been identified in collaboration with RMS. The opportunities and solutions have incorporated any future aspirations for the road network that we have been made aware of including the M1 Smart Motorways project. The characteristics of these are described below and are presented in Appendix D except as noted.

Western Distributor (northbound)

- Allowance for future widening of the Western Distributor to three lanes on the approach to the 161 Sussex St underpass;
- Allowance for future ramp metering of Harbour Street to meter traffic destined for the Harbour Bridge.

Western Distributor (southbound)

- Consideration of potential remarking of the southbound Western Distributor between existing type-f barriers to two lanes. The structural elements of the landbridge have been positioned to be compatible with this;
- Positioning of structural elements associated with the landbridge so as not to inhibit existing two lane marking of southbound Harbour Street between existing type-f barriers.

Provision of a slip lane for Wheat Road exit (refer to Appendix D and J)

- Removal of Wheat Road and back of house conflicts associated with the development;
- Improved alternate access to Shelly Street such that the Harbour Street ramp metering can be optimised to meter traffic destined for the Harbour Bridge without delaying traffic destined for Shelly Street;
- Speed reduction measures for realigned Wheat Road to be considered.

Shelly Street exit

- Flexibility for RMS to close the Shelly Street off-ramp and optimise the performance of ramp metering of Harbour Street as part of the M1 Smart Motorway (north) project.

Harbour Street access consolidation

- Flexibility for RMS to consolidate access arrangements from Harbour Street northbound associated with the IMAX Theatre redevelopment;
- Revised options for vehicle access to the development have been prepared for RMS's consideration. Refer to Appendix K.

With the above solutions, direct access is provided to the Harbour Bridge, reducing traffic in Shelley Street, the bus stop at the rear of Helm Bar in Wheat Road is retained and the bus stop and taxi stands at the IMAX Theatre redevelopment are retained.

4 Conclusion

In response to the comments RMS have provided to State Significant Development Application SSD7684 and as part of the design development, the project team have collaborated with RMS to develop solutions that enable the proposed development, and particularly the landbridge and its associated supports, to co-exist with the existing road network as well as any foreseen future modifications to that network. This report provides a summary of the outputs that have been agreed in principle during that process. A table of all RMS Submissions and the current agreed status in relation to each of those submissions can be found in Appendix L.

We look forward to a continued collaborative approach during the design development, stage 2 SSDA submission, to ensure that the integrity and operation of the road network is maintained.

Appendices

Appendix A
RMS response to SSD7684

10 March 2017

Attention: Brendon Roberts

Team Leader – Key Sites Assessments
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Brendon,

State significant development application – SSD7684 - Staged redevelopment of Cockle Bay Wharf
241 – 249 Wheat Road, Cockle Bay Darling Harbour

Roads and Maritime Services (Roads and Maritime) refers to development application number SSD7684 (the **DA**) lodged by JBA Urban Planning Consultants Pty Ltd on behalf of DPT Operator Pty Ltd and DPPT Operator Pty Ltd (**Proponent**) for a staged development.

The staged development involves the construction of new buildings comprising retail, bars and restaurants, commercial offices and upgrades to public areas (**Project**). The detailed design and construction of the Project will be the subject of separate, future development applications.

The purpose of this letter is to provide comments from Roads and Maritime in respect of the Project.

Roads and Maritime does not support the Project in its current form and would not be in a position to provide any consent required. A more detailed list of concerns is outlined below. Roads and Maritime would appreciate the opportunity to meet with the Developer and the Department to seek to address these concerns.

BACKGROUND

The Project involves development over and around part of the Western Distributor adjacent to 241 – 249 Wheat Road, Cockle Bay. The development includes the construction of a large "land bridge", being a concrete podium structure (**Podium**), to be built over the Western Distributor. The structure will need to be supported with piers located within or adjacent to the area of the Western Distributor.

The Western Distributor is a substantial reinforced concrete structure which is used by a large number of vehicles. It provides one of the main road arteries through the Sydney Central Business District and is an essential and significant component of Sydney's transport infrastructure.

The Project is to be located, in part, within land owned by Property NSW (previously the Sydney Harbour Foreshore Authority). The area of land comprising the Western Distributor is managed by Roads and Maritime and is expected to be transferred from Property NSW to Roads and Maritime following completion of surveys of the relevant parts of the Western Distributor.

The Project also has the potential to impact on the Cross City Tunnel and the Cross City Tunnel assets (including the ventilation stack). There is insufficient information as to whether there could be an impact on the Cross City Tunnel ventilation including air quality and access.

It is essential to Roads and Maritime that, if the Minister grants consent to the DA, the construction and operation of the Project does not compromise the safety or structural integrity of the Western Distributor or the ability of Roads and Maritime to access and maintain the engineering structures forming the Western Distributor (consistent with the intent of paragraph 9 of the Secretary's Environmental Assessment Requirements dated 23 June 2016).

Roads and Maritime has reviewed the DA and has identified a number of matters relating to the Project that if not managed appropriately may impact on the structural integrity of the Western Distributor, the safety of the surrounding road infrastructure and the ability of Roads and Maritime to have sufficient access for ongoing maintenance, repairs and, if necessary, replacement of the Western Distributor.

THE PROJECT

Roads and Maritime has identified the following issues which require consideration, assessment and resolution before the development application should be determined:

a) **Closure of the Western Distributor -** the Western Distributor is critical transport infrastructure. Roads and Maritime will not permit the Western Distributor to be closed to enable construction of the Project including the Podium over the Western Distributor. The proponents will need to properly demonstrate how the Project can be safely and efficiently constructed over the Western Distributor without closure or interruption of traffic flow to Roads and Maritime satisfaction.

b) **Fire Safety –** the Project will have the effect of creating a "tunnel" underneath the Podium. The Proponent will need to demonstrate that there is adequate provision for fire safety underneath the podium having regard to the traffic flow. This provision may, for example, include fire sprinklers and other infrastructure installed as part of the Project.

c) **Security –** the proponent will need to demonstrate to Roads and Maritime satisfaction that the Project does not pose an unacceptable security risk.

d) **Piering Options –** Roads and Maritime has asked the proponent to identify where the piers for the Podium are to be located in relation to the Western Distributor. Roads and Maritime has requested a "no piers" in addition to the proposed "piers" option be investigated and considered. The location of the piers for the Podium in relation to the Western Distributor is required to enable the practical consideration of matters relating to structural integrity, accessibility, safety, security and maintenance, repair, augmentation and replacement. The development application should not be determined until this information has been provided and addressed to Roads and Maritime satisfaction.

e) **Access for Maintenance and Repair** – the proponent will need to be able to demonstrate to Roads and Maritime satisfaction that the Podium will not unreasonably interfere with Roads and Maritime ongoing ability to access the Western Distributor and its surrounds for the purposes of maintenance, repair, augmentation and, if necessary, replacement of the Western Distributor.

f) **Wheat Road –** the proponent will need to provide further details of the arrangements to be made around the Site, particularly around Wheat Road, to enable safe and efficient vehicular access to the Project without unreasonably interfering with existing traffic flows. Roads and Maritime notes that there is currently an approved development for the IMAX Theatre which contemplates potential changes to these roads. Any proposed changes in this development application need to be consistent with any changes approved as part of the IMAX Theatre redevelopment (SSD 7388). The proponent will need to ensure that access, including emergency access, is maintained at all times to the Cross City Tunnel assets including in and around the ventilation stack, to the satisfaction of Roads and Maritime and the Cross City Tunnel operators. In this regard, the Project contemplates the modification of the Harbour Street/Wheat Road and Blackwattle Place intersection to allow left and right turn movements on to Harbour Street, however, the modifications contemplated by the Project would unreasonably compromise through traffic movements in this area and the traffic volumes contemplated by the Project do not warrant traffic control lights. The proposed intersection arrangement should be investigated from a road safety perspective and details of how taxi, pedestrian and vehicle movements will be affected under the proposed modifications and how the changes should be maintained should be considered.

g) **Structural Integrity** – the proponent will need to demonstrate that the Project will not impact on the structural integrity of the Western Distributor and will be designed to meet all relevant safety requirements for the Western Distributor including natural disasters.

h) **Constructability –** the proponent will need to be able to provide details of the methodology of how the Podium is to be constructed over the Western Distributor to ensure the above issues are addressed.

i) **Responsibility** – the proponent will need to demonstrate to Roads and Maritime satisfaction that it will take long term responsibility for the elements of the Project which interface with Roads and Maritime infrastructure to Roads and Maritime satisfaction to ensure that the structural integrity and Roads and Maritime ability to access the Western Distributor for maintenance, repair, augmentation and replacement is not compromised.

j) **Works Authorisation Deed** – the proponent will need to enter into a works authorisation deed with Roads and Maritime relating to the construction of the Project to ensure that the Project is constructed consistently with Roads and Maritime requirements and to Roads and Maritime satisfaction and that the above issues are appropriately addressed.

In any event, Roads and Maritime is of the view that no construction certificate for any part of the Project should be released until such time that the detailed design plans of the structures over the Western Distributor and construction methodology are submitted to and approved by Roads and Maritime.

If the Minister decides to grant development consent for the Project, Roads and Maritime submits that the conditions of consent set out in **Schedule A** of this letter should be imposed.

For the purposes of the DA and any consent the Minister grants to the DA, the "Western Distributor" should be defined as:

> *"the structure and all associated components of the road known as the Western Distributor located in, above, below and adjacent to the land required for the Project, including the footings, anchors, pylons, tie downs, disused deck known as the Stub, road deck, road surface and supporting structures".*

For your reference, Roads and Maritime **encloses** a copy of Roads and Maritime Technical Direction (GTD 2012/001) - Excavation Adjacent to Roads and Maritime Infrastructure.

Roads and Maritime would be pleased to meet with the Department of Planning and Environment to discuss the proposed conditions of consent and their suitability in the circumstances, if the Department so wishes.

If you have any questions, please contact Angela Frew on 8849 2041 or at development.sydney@rms.nsw.gov.au

Yours sincerely

Adam Berry
Principal Network Manager CBD & East Precinct
Network Sydney

SCHEDULE A

Design and Construction of the Project

1. The Proponent must consult Roads and Maritime Sydney Asset Manager at the preliminary and detailed design stages to ensure that the appropriate clearances from the Western Distributor structures are provided to allow for access for inspection and maintenance of those structures and to ensure that the Western Distributor is not adversely affected by the Project or any works undertaken in connection with its construction.

2. The Project must not be constructed within 3 metres of the Western Distributor.

3. The proposed design and construction of the Project must be investigated for integrity and serviceability by a qualified practicing bridge structural and geotechnical engineer(s) to Roads and Maritime satisfaction.

4. The design and construction of the Project must comply with Roads and Maritime Technical Direction (GTD 2012/001) - Excavation Adjacent to Roads and Maritime Infrastructure. A copy of the Technical Direction can be downloaded via the following link: http://www.rta.nsw.gov.au/doingbusinesswithus/engineeringpolicies/technicaldirections.html

5. The Proponent must submit a geotechnical and structural investigation report, design drawings, and the methodology for the proposed construction of the Project to Roads and Maritime for assessment and approval. The Proponent must not commence construction of the Project unless and until Roads and Maritime has approved the geotechnical investigation and structural investigation report, design drawings and construction methodology. If any new structures or footings are proposed near or adjacent to the pylons for the Western Distributor, then Roads and Maritime approval must be obtained at the preliminary and detailed design stages.

6. The Proponent must provide Roads and Maritime with any-time access to the Project to enable Roads and Maritime to carry out inspection, repairs and maintenance of the Western Distributor and the Project must be designed to facilitate these works on an ongoing basis and after construction of the Project is complete.

7. The design of the Project must not prevent Roads and Maritime from undertaking future propping or jacking activities on the Western Distributor associated with joint or bearing repairs/replacement.

8. The design of the land bridge over the Western Distributor must contemplate two options, both the no piers option and a piers option, and consider the potential impacts of both options on road network efficiency and the safety of the land bridge in case of earthquake.

ROAD SAFETY

9. The Project is to be provided with a fire protection and exhaust system such that heat, smoke and exhaust from traffic on the Western Distributor do not endanger persons, the Podium or Roads and Maritime structures, or vehicles on the Western Distributor (a qualified Fire Engineer's Certificate is required). Roads and Maritime is to be consulted prior to issue of a construction certificate for any of the structures adjacent to or over the Western Distributor to ensure that the appropriate systems are incorporated as per the relevant Australian standards.

10. The Project is also to be provided with an air quality assessment and plan that disperses vehicle emissions under the bridge to provide air quality that meets the requirements of the

relevant Australian standards. The assessment should also consider whether there is likely to be any impact on the Cross City Tunnel ventilation.

11. The external facades of the Project must be designed to minimise damage from potential vandalism and debris impacts from passing traffic. Suitable protection screens should be installed on the Project where appropriate to ensure that access is prevented between the Western Distributor and the Project by vandals who may attempt to graffiti any part of the Western Distributor.

12. All external facades of the Project should be positioned and aligned to have a reflectivity that ensures that motorists on the Western Distributor are not blinded or disabled from maintaining control of vehicles. To ensure compliance, assessment of the potential effects of the proposed façade of the Project on the reflectivity and glare environment in the surrounding area is to be undertaken and submitted for Roads and Maritime to review.

13. The Project is to be designed to prevent any falling object from impacting adversely on the Western Distributor or members of the public during construction and operation. In this regard, reference should be made to the Work Health & Safety requirement guidelines which may be provided upon request by Roads and Maritime.

ACCESS

14. Access is required to the Project area so that Roads and Maritime may carry out inspections, maintenance and rehabilitation works on the Western Distributor. The Project shall not preclude or restrict right of access to any part of the structure.

15. Parts of the project that are located below or adjacent to the Western Distributor may require additional strengthening to accommodate Roads and Maritime access and maintenance. As such, the relevant part of the structure of the Project needs to be able to carry a working load of not less than 2.5kPa. Access to these parts of the Project is required for Roads and Maritime 24 hours per day so that Roads and Maritime may carry out inspections, maintenance and rehabilitation works.

16. The Proponent must facilitate access to the substructure and superstructure of the Western Distributor, including access via the Project area for inspections, maintenance and rehabilitation works.

17. Given that some parts of the Western Distributor's structures, including the columns and piers and the superstructure, are within close proximity to the Project, it may be appropriate for Roads and Maritime to carry out investigation and maintenance works at the same time as work is being undertaken to construct the Project. The maintenance activities will depend on the result of the investigations and would most likely involve applying a coating system to the bridge structure and/or cathodic protection to the bridge.

ADDITIONAL REQUIREMENTS

18. The Proponent must enter into a Works Authorisation Deed (**WAD**) with Roads and Maritime for the works associated with the Project. The WAD must be executed prior to Roads and Maritime assessment of any required detailed civil design plans. Roads and Maritime fees for administration, plan checking, civil works inspections and project management must be paid by the Proponent prior to the commencement of any construction works.

19. Before commencing any construction works, the Proponent must commission reports to investigate and assess the impacts of the Project on the Western Distributor. Construction

works for the Project may not be undertaken until Roads and Maritime has confirmed in writing that the Project's impacts are acceptable.

20. In constructing the Project, the Proponent must not:

    a) drill or undertake any works to any part of the Western Distributor or that will affect any part of the Western Distributor;

    b) damage any part of the Western Distributor; and

    c) adversely impact on the structural integrity of the Western Distributor.

21. During construction of the Project:
    a) the Proponent must consult with Roads and Maritime to give Roads and Maritime the opportunity to carry out investigation and maintenance activities at the same time as the work on the Project;

    b) the Proponent must ensure that the use of any cranes does not involve the carrying of any "loads" over or above the Western Distributor; and

    c) all works associated with the Project must be at no cost to the Roads and Maritime.

22. A Construction Traffic Management Plan that details construction vehicles' routes, the number of trucks, hours of operation, road closures access arrangements and traffic control should be submitted to Council, Roads and Maritime and TfNSW prior to the issue of a Construction Certificate. The EIS states George Street will be a truck route for the site, this is not supported by Roads and Maritime due to the light rail project and vision for George Street focusing on pedestrian amenity.

Operation and Maintenance of the Project

23. The Proponent must prepare and submit an Emergency Response Plan to Roads and Maritime and the Minster for approval prior to the issue of a construction certificate in relation to the Project. The Emergency Response Plan must include standard operating procedures for managing construction, site emergencies and incidents associated with the Project and the Western Distributor so far as it relates to the Project.

24. During construction and operation of the Project, the Proponent must provide Roads and Maritime with access to the Project and the surrounding land at all times to enable Roads and Maritime to inspect, maintain and repair the Western Distributor. Roads and Maritime will provide at least 48 hours of notice to the Proponent before accessing the Project except where emergency inspection, maintenance or repair is required in which case Roads and Maritime may access the Project and surrounding land without notice. The Proponent must facilitate Roads and Maritime access to the Western Distributor including access within the Project structure and the removal of parts of the Project at the Proponent's cost as reasonably directed by the Roads and Maritime. The Proponent must allow access by persons and all plant and equipment associated with the inspection, maintenance and repair of the Project.

Alterations to or demolition of the Project

25. The Proponent must obtain prior approval from Roads and Maritime for any alterations or additions to the Project.

Vehicle Access to the site

26. The vehicular access movements to the site have not been adequately addressed, the current access provisions are not supported by Roads and Maritime, the proponent is to consult with Roads and Maritime regarding the preparation of a traffic report for subsequent stages of the development. The following points are to be addressed in any subsequent application for the site:

    a) In relation to the Traffic and Parking Assessment (**report**) submitted as part of this application, Roads and Maritime advises previous comments on the vehicular access to the site have not been addressed. These concerns are regarding the modification of the Harbour Street/Wheat Road and Blackwattle Place intersection to allow right turn/left turn movements on to Harbour Street.

       Roads and Maritime previously raised concerns to the modification of the existing traffic control lights at Harbour Street/Blackwattle Place intersection. The report dated October 2016, does not reflect the existing operations of this traffic control light, this intersection experiences significant levels of congestion and queues can extend through the intersection both north and south bound on Harbour Street, especially during peak periods. Existing traffic conditions show vehicles travelling northbound to the Western Distributor can queue back to Bathurst Street. The introduction of another phase will only impact on the through traffic at this location further and is not supported. Priority is given to north and southbound movements through this intersection. A right turn phase would reduce through movements. The traffic volumes generated by the development would not warrant traffic control lights in accordance with the Traffic Signals Guide Section 2 Warrants.

       Roads and Maritime suggests the applicant should consider a left-in left-out restricted movement at the Wheat Road/Harbour Street intersection provided it is priority controlled.

    b) Details are required regarding the proposed trip distribution to and from the site

    c) An assessment should be undertaken on the available area for vehicles to queue on Wheat Road on approach to the intersection of Wheat Road and Harbour Street.

    d) An electronic copy of all future intersection modelling should be provided to Roads and Maritime for review.

    e) The proposed intersection arrangement with the adjoining development should be investigated from a road safety perspective, the arrangement of entering from Harbour Street and vehicles turning from the Porte Cohere to go into the basement parking appears to show cars driving on the incorrect side of the road.

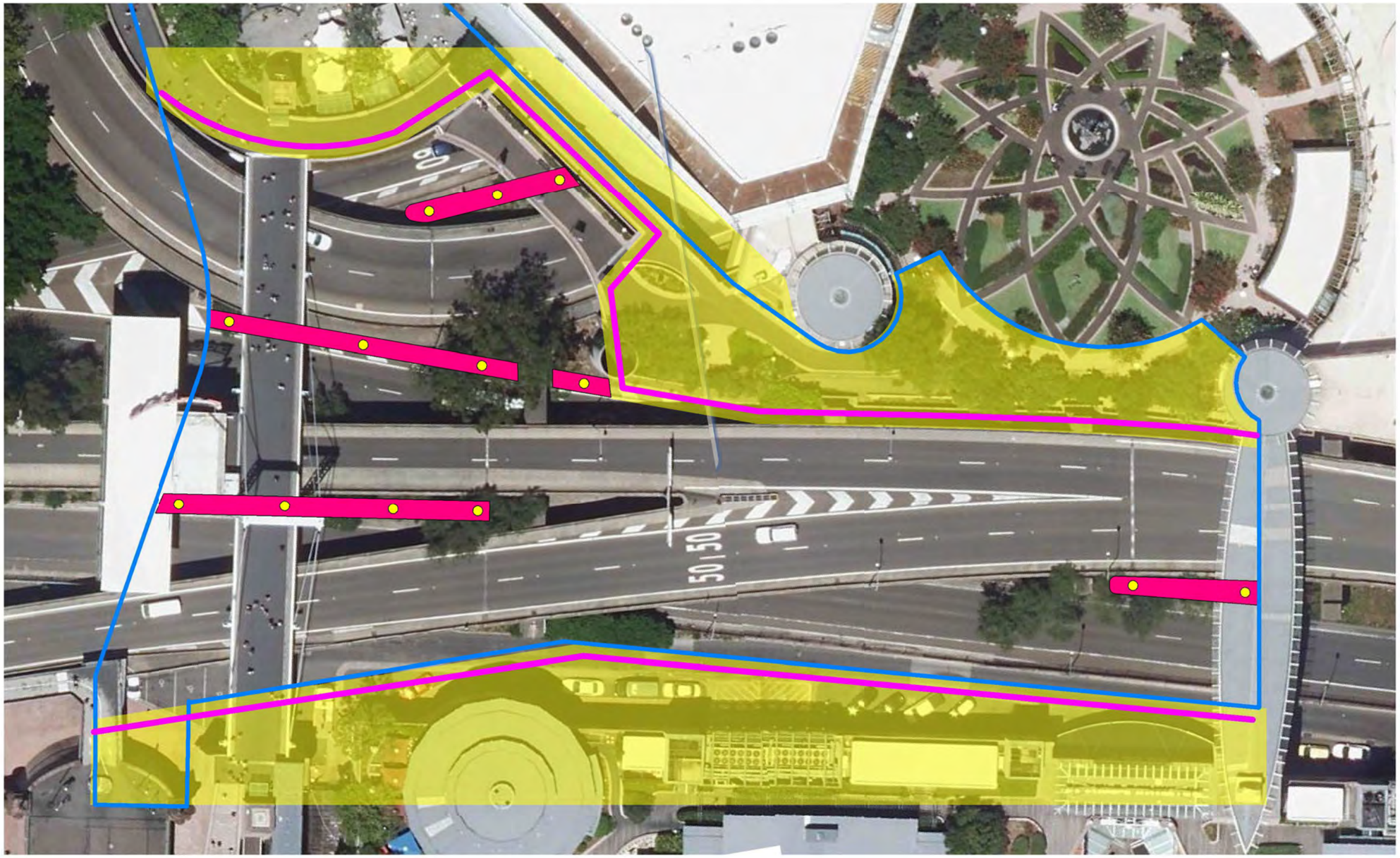
    f) Turn paths shall be provided to show the largest vehicles and coaches can turn left from Wheat Road onto Harbour Street to travel northbound. Turn paths are also required for the new road through the site illustrating all types of vehicles can use the turnaround facilities proposed site.

    g) Details are required for taxi ranks locations, service vehicle loading and unloading within Wheat Road.

    h) Further details of how the proposal is improving pedestrian accessibility to and from Cockle Bay.

Appendix B
Central Piers Scheme

enstruct



PROS	CONS
• SIGNIFICANT NUMBER OF PIERS WITHIN CBW LAND • SHALLOWER STRUCTURAL BEAMS • SMALLER LIGHTER ELEMENTS TO INSTALL • GREATER FLEXIBILITY FOR LAND BRIDGE DESIGN	• RESTRICTED FUTURE FLEXIBILITY FOR WESTERN DISTRIBUTOR 3rd LANE / WIDENING • INCREASED LIFTS AND CONSTRUCTION WITHIN WD CORRIDOR

COCKLE BAY PARK

Western Distributor Corridor - Central Piers Scheme

SK-06

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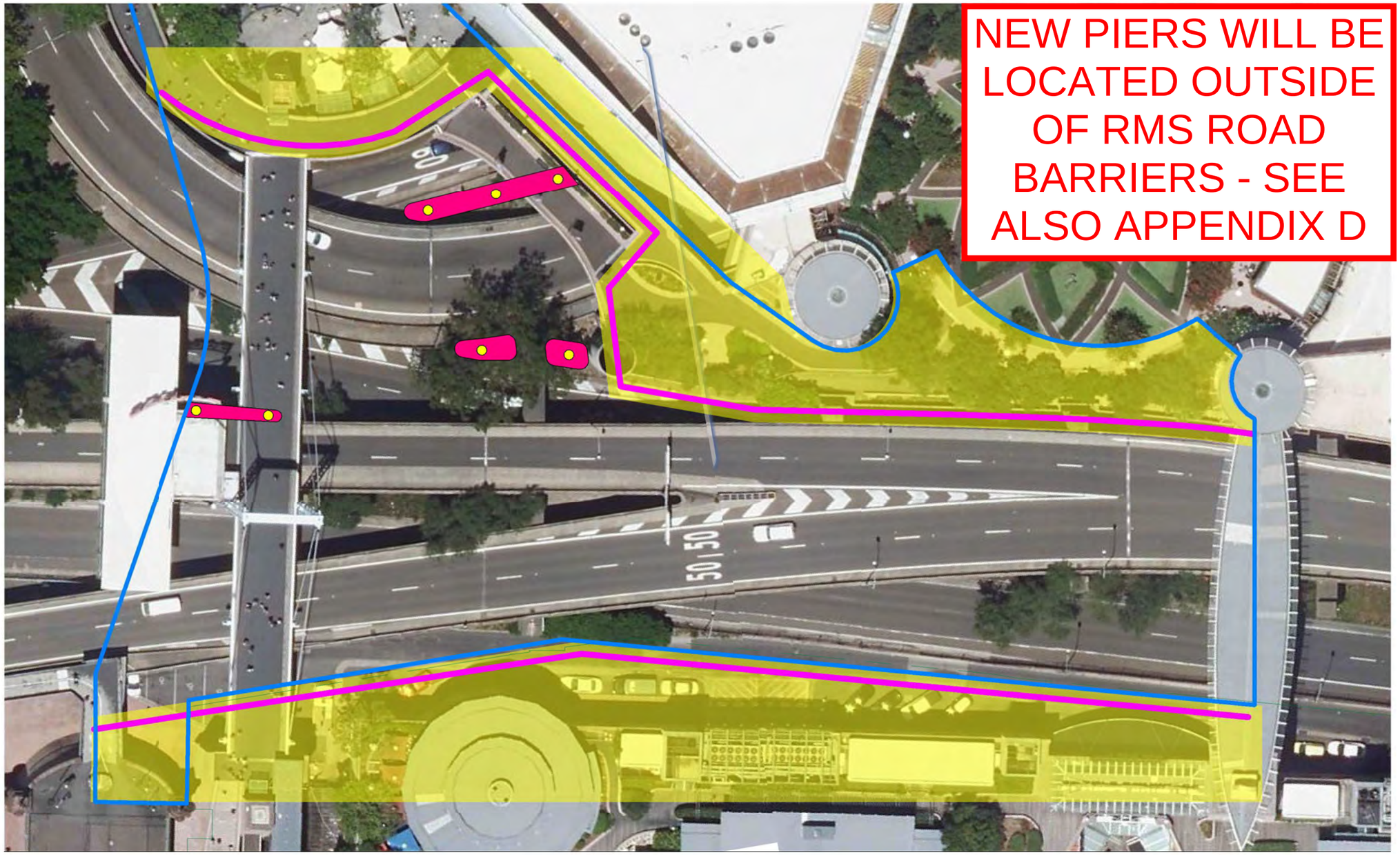
NOT ADOPTED

Appendix C
No Central Piers Option

enstruct



PROS	CONS
• NO PIERS WITHIN ADVISED RMS EXPANSION ZONE • PROVIDES FUTURE FLEXIBILITY FOR RMS NETWORK • SIGNIFICANT NUMBER OF PIER WITHIN CBW LAND • REDUCED NUMBER OF LIFTS & CONSTRUCTION WITHIN WD CORRIDOR • REDUCED RISK STRIKING IN GROUND SERVICES • REDUCED TOTAL ROAD CLOSURES	• DEEPER STRUCTURAL BEAMS (Min. CLEARANCES MAINTAINED) • LARGER HEAVIER ELEMENTS TO INSTALL • REDUCED FLEXIBILITY FOR LAND BRIDGE PUBLIC DOMAIN OPTIMIZATION (LOADS / LEVELS)

Western Distributor Corridor - No Central Piers Option

COCKLE BAY PARK

SK-07

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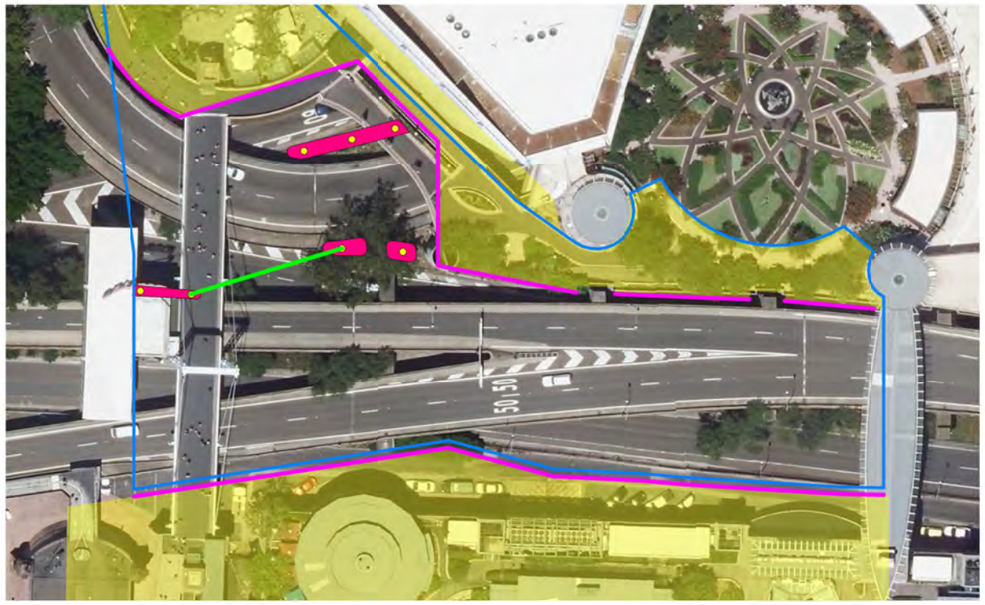
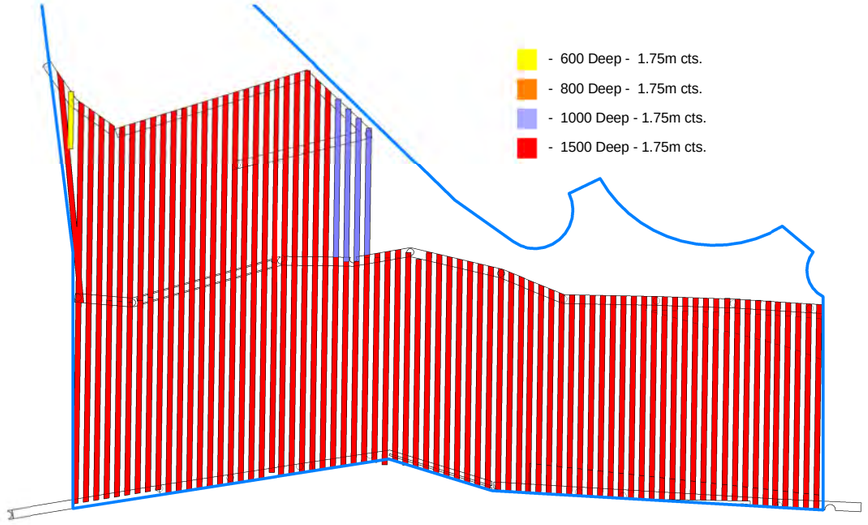
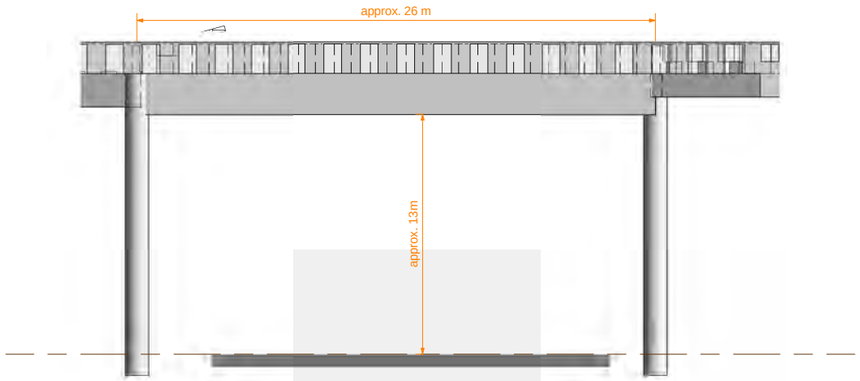
PROPOSED



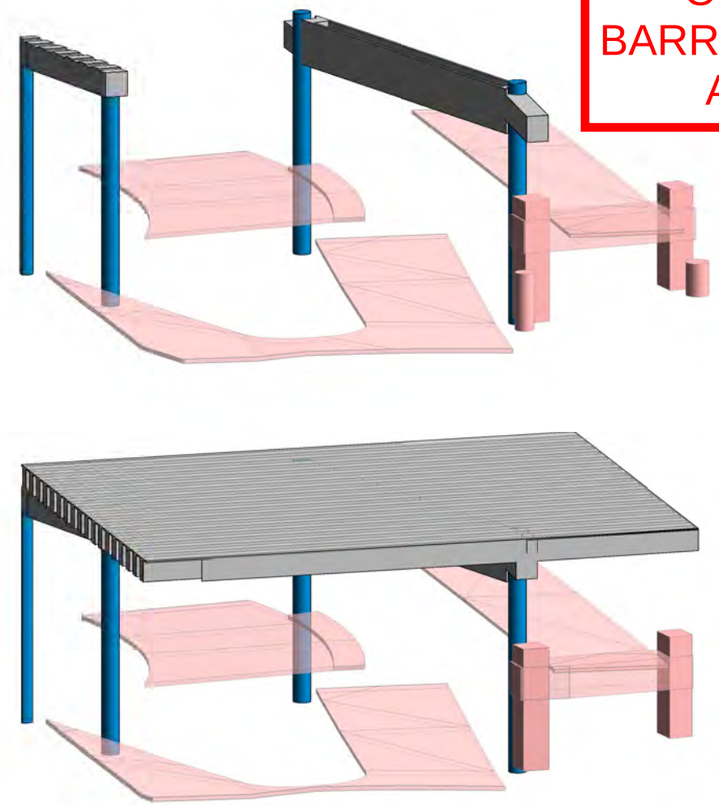
available vertical zone (indicative columns shown)
line of support within adjacent structures
adjacent structures
indicative bridge deck profile
3.5m deep precast beam



NEW PIERS WILL BE LOCATED OUTSIDE OF RMS ROAD BARRIERS - SEE ALSO APPENDIX D



Truss Elevation
SCALE:1 : 150



Indicative Southern column location

Indicative Northern column location

Rev.	Date	Description	By
5	15.08.17	ISSUED FOR INFORMATION	ML
4	26.07.17	ISSUED FOR INFORMATION	ML
3	14.06.17	ISSUED FOR INFORMATION	ML
2	26.05.17	ISSUED FOR INFORMATION	ML
1	18.11.16	ISSUED FOR INFORMATION	ML

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project
COCKLE BAY PARK

drawing title
LAND BRIDGE CONCEPTS

status
FOR INFORMATION

scale at A1	drawn by	checked	date
As indicated	ML	RC	11/18/16

project no.	drawing no.	rev.
4886	ST-103-50	5

15/08/2017 10:02:02 AM

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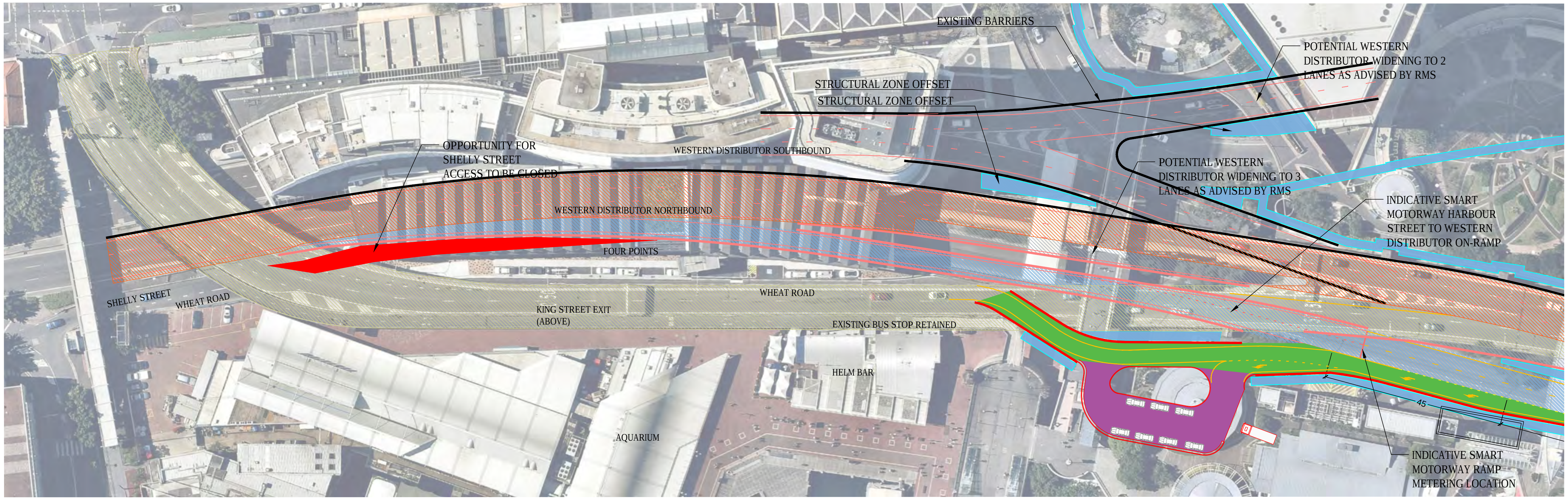
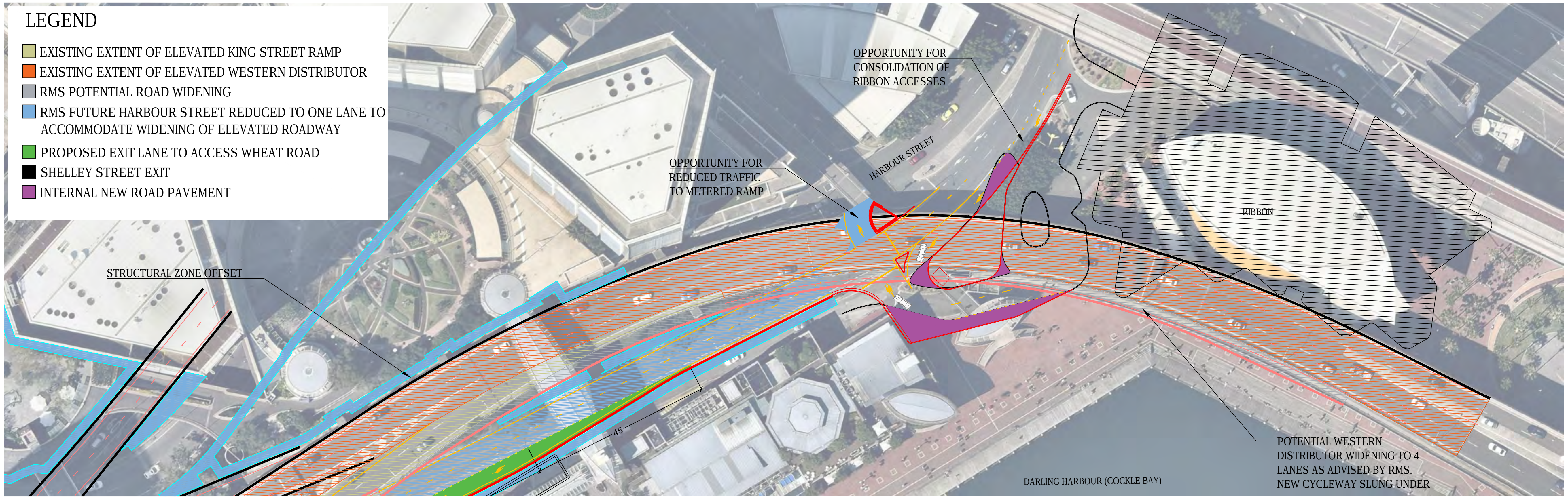
PROPOSED

Appendix D
Future RMS Projects and Structural Zones


EXISTING BARRIERS
POTENTIAL WESTERN DISTRIBUTOR WIDENING TO 2 LANES AS ADVISED BY RMS
STRUCTURAL ZONE OFFSET
STRUCTURAL ZONE OFFSET
OPPORTUNITY FOR SHELLY STREET ACCESS TO BE CLOSED
WESTERN DISTRIBUTOR SOUTHBOUND
POTENTIAL WESTERN DISTRIBUTOR WIDENING TO 3 LANES AS ADVISED BY RMS
INDICATIVE SMART MOTORWAY HARBOUR STREET TO WESTERN DISTRIBUTOR ON-RAMP
WESTERN DISTRIBUTOR NORTHBOUND
FOUR POINTS
SHELLY STREET
WHEAT ROAD
KING STREET EXIT (ABOVE)
WHEAT ROAD
EXISTING BUS STOP RETAINED
HELM BAR
AQUARIUM
45
INDICATIVE SMART MOTORWAY RAMP METERING LOCATION


LEGEND
EXISTING EXTENT OF ELEVATED KING STREET RAMP
EXISTING EXTENT OF ELEVATED WESTERN DISTRIBUTOR
RMS POTENTIAL ROAD WIDENING
RMS FUTURE HARBOUR STREET REDUCED TO ONE LANE TO ACCOMMODATE WIDENING OF ELEVATED ROADWAY
PROPOSED EXIT LANE TO ACCESS WHEAT ROAD
SHELLEY STREET EXIT
INTERNAL NEW ROAD PAVEMENT
OPPORTUNITY FOR CONSOLIDATION OF RIBBON ACCESSES
HARBOUR STREET
OPPORTUNITY FOR REDUCED TRAFFIC TO METERED RAMP
RIBBON
STRUCTURAL ZONE OFFSET
45
DARLING HARBOUR (COCKLE BAY)
POTENTIAL WESTERN DISTRIBUTOR WIDENING TO 4 LANES AS ADVISED BY RMS. NEW CYCLEWAY SLUNG UNDER

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CLIENT				
	REV	DATE	REVISION DETAILS	APPROVED
	A	20.07.17	DRAFT FOR COMMENT	MO
	B	03.07.17	DRAFT FOR COMMENT - FRONT OF HOUSE AMENDED	MO
	C	07.08.17	NON RMS NOTES REMOVED	MO
	D	10.08.17	LEGEND AMENDED	MO

SCALE	SIZE
1:1000	A1

DRAWN: NO
DESIGNED: NO
REVIEWED:

NOT FOR CONSTRUCTION

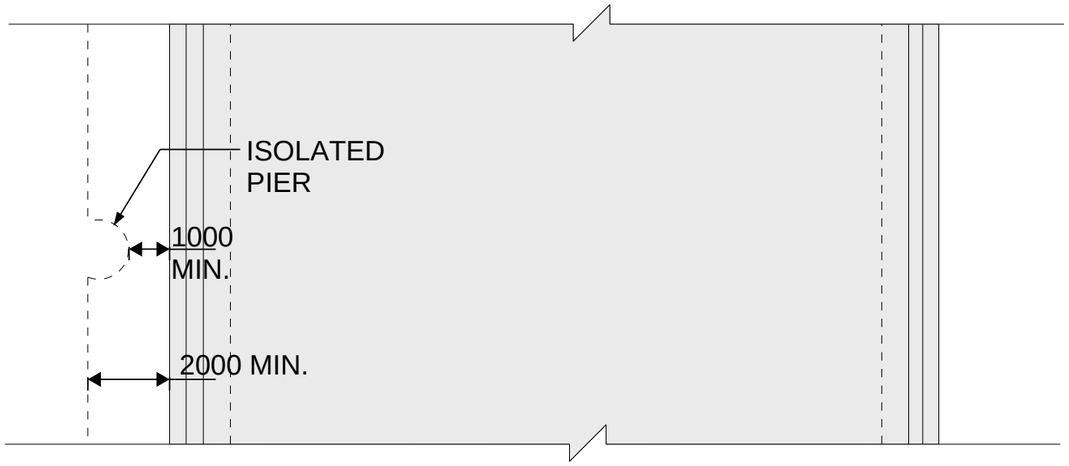
APPROVED
DATE

PROJECT: COCKLE BAY WHARF, DARLING HARBOUR

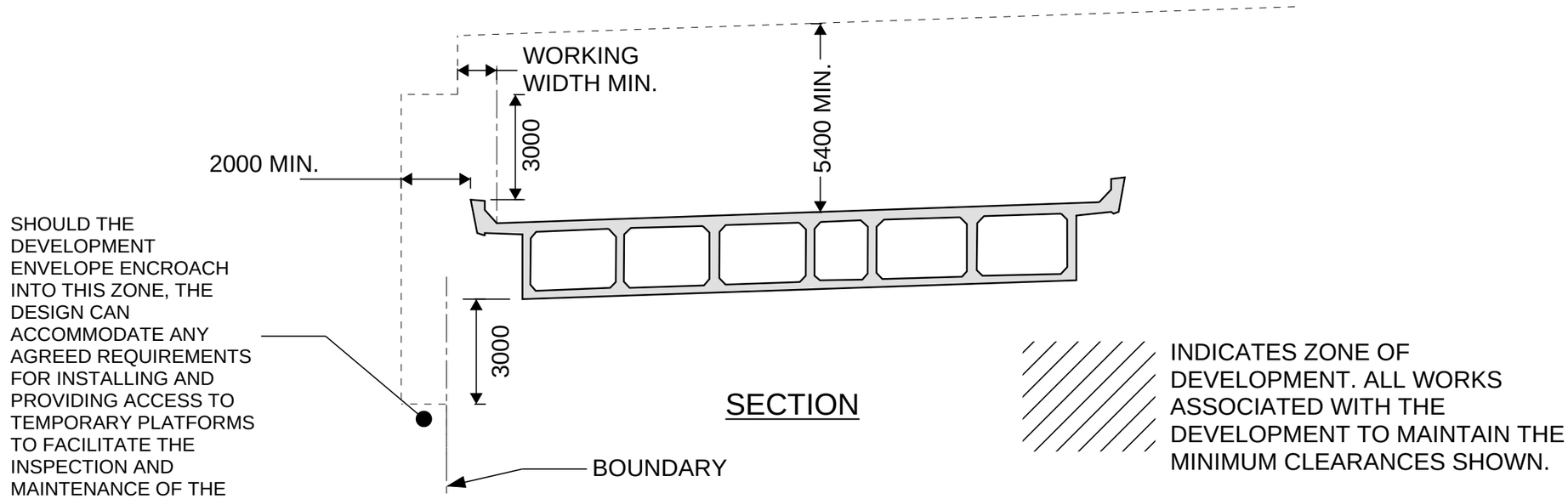
TITLE: ROAD WORKS FUTURE RMS PROJECTS & STRUCTURAL ZONES

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	253427	002	SK	RD	0002	D

Appendix E
Intent of Clearance to Elevated Western Distributor Structure



PLAN



SECTION

SHOULD THE DEVELOPMENT ENVELOPE ENCROACH INTO THIS ZONE, THE DESIGN CAN ACCOMMODATE ANY AGREED REQUIREMENTS FOR INSTALLING AND PROVIDING ACCESS TO TEMPORARY PLATFORMS TO FACILITATE THE INSPECTION AND MAINTENANCE OF THE ELEVATED STRUCTURE IF REQUIRED.

INDICATES ZONE OF DEVELOPMENT. ALL WORKS ASSOCIATED WITH THE DEVELOPMENT TO MAINTAIN THE MINIMUM CLEARANCES SHOWN.

COCKLE BAY PARK
INTENT OF CLEARANCE TO ELEVATED WESTERN DISTRIBUTOR STRUCTURE

THE INTENDED CLEARANCES SHOWN IN THIS DIAGRAM HAVE BEEN PROPOSED FOLLOWING COORDINATION WITH RMS REGARDING THE ACCESS REQUIREMENTS TO INSPECT AND MAINTAIN THE ELEVATED WESTERN DISTRIBUTOR STRUCTURE. WITH THESE CLEARANCES, THERE IS NOT EXPECTED TO BE ANY SIGNIFICANT CHANGE TO THE ABILITY TO SAFELY ACCESS AND MAINTAIN THE ROAD NETWORK AS A RESULT OF THE PROPOSED LANDBRIDGE.

COCKLE BAY PARK LANDBRIDGE - ACCESS FOR MAINTENANCE AND REPAIR OF THE ELEVATED WESTERN DISTRIBUTOR

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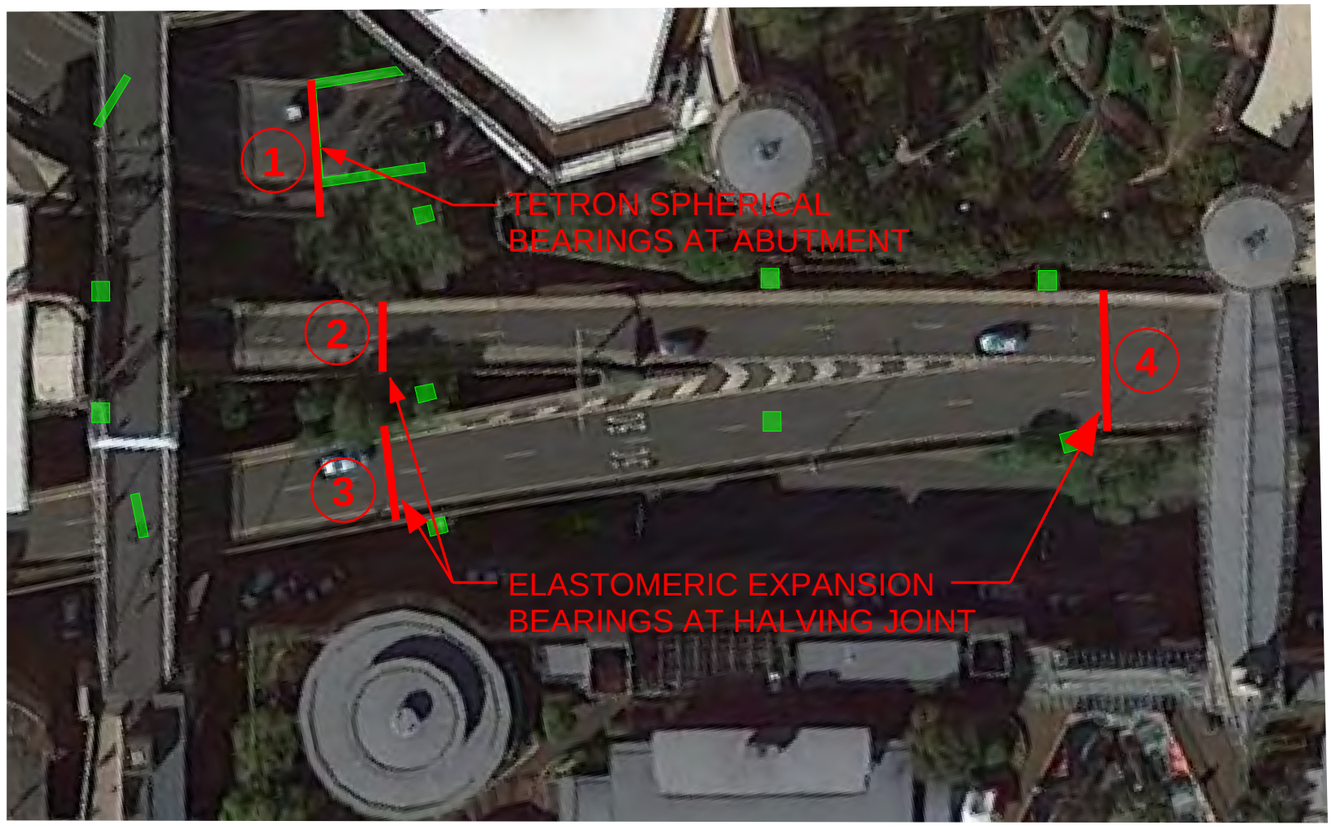
Appendix F
Access for Maintenance and Replacement of Bearings at Joints



LOCATIONS OF JOINTS IN THE WESTERN DISTRIBUTOR ELEVATED STRUCTURE OVER THE EXTENT OF THE PROPOSED COCKLE BAY WHARF LANDBRIDGE

1 TETRON SPHERICAL BEARINGS AT MARKET ST ABUTMENT

GENERAL INSPECTION AND MAINTENANCE OF THESE BEARINGS CAN BE UNDERTAKEN VIA TEMPORARY SCAFFOLDING SET UP BENEATH THE STRUCTURE - THE OVERALL DEPTH OF THE BEARING ALLOWS ADEQUATE SPACE. SHOULD REPLACEMENT OF THESE BEARINGS BE REQUIRED, THE SUSPENDED DECK CAN BE RAISED VIA JACKS INSTALLED BETWEEN THE ABUTMENT SHELF OR THE GROUND LEVEL AND THE SOFFIT OF THE DECK. CONSTRUCTION OF THE PROPOSED LANDBRIDGE ABOVE DOES NOT COMPROMISE THE ABILITY TO MAINTAIN THESE BEARINGS.

2 ELASTOMERIC EXPANSION BEARINGS AT HALVING JOINT

THE ORIENTATION OF THE HALVING JOINT DETERMINES THAT ACCESS FOR INSPECTION AND MAINTENANCE OF BEARINGS IS LIMITED TO INTERNAL OPENINGS WHICH CAN BE ACCESSED VIA MANHOLES IN THE SOFFIT OF THE DECK AND TO THE OUTSIDE OF THE STRUCTURE. REPLACING BEARINGS WOULD INVOLVE JACKING UP THE DECK EITHER FROM FRAMES INSTALLED AT GROUND LEVEL OR FLAT JACKS WITHIN THE 150mm VERTICAL GAP AT THE HINGE JOINT. THE BEARINGS WOULD THEN NEED TO BE REMOVED AND REPLACED THROUGH THE INTERNAL BEARING ACCESS OPENINGS OR THE OUTSIDE OF THE STRUCTURE FOR THE OUTER BEARINGS. CONSTRUCTION OF THE PROPOSED LANDBRIDGE ABOVE DOES NOT COMPROMISE THE ABILITY TO MAINTAIN THESE BEARINGS.

3 AS ABOVE

4 AS ABOVE

COCKLE BAY PARK LANDBRIDGE - ACCESS FOR MAINTENANCE AND REPLACEMENT OF BEARINGS AT JOINTS

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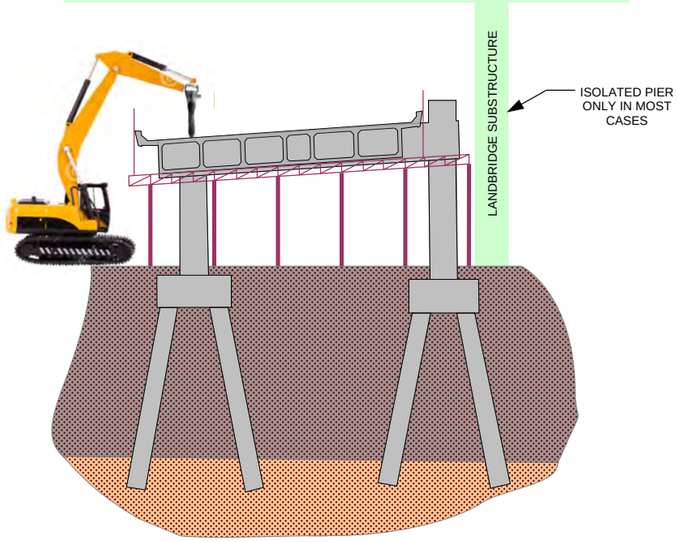
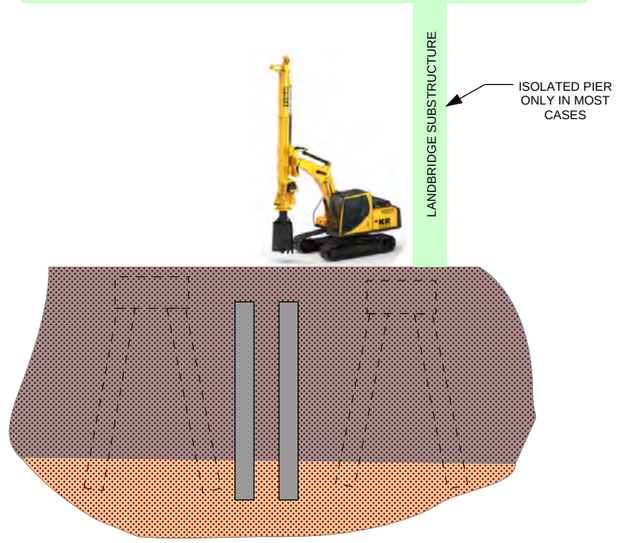
Appendix G
Demolition and Replacement of the Western Distributor

LANDBRIDGE SUPERSTRUCTURE



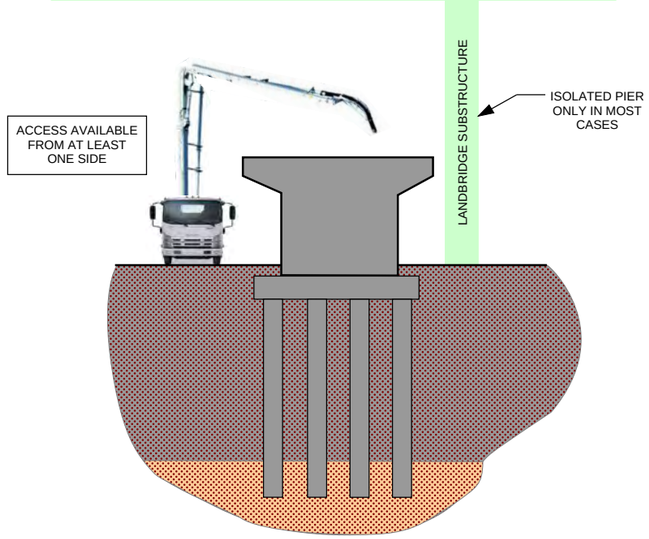
1. EXISTING ELEVATED CAST INSITU STRUCTURE DEMOLISHED VIA SAWCUTTING OR HAMMERING WHILST SUPPORTED ON A CATCH DECK

LANDBRIDGE SUPERSTRUCTURE



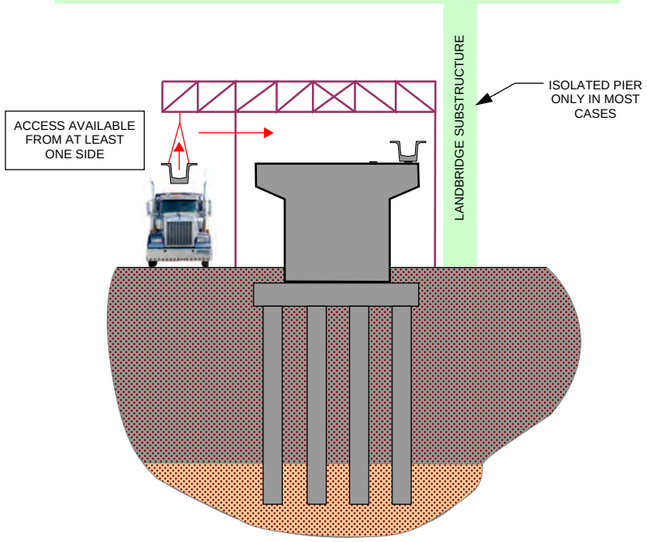
2. AFTER DEMOLITION OF THE ELEVATED STRUCTURE, INSTALL INSITU CONCRETE PILES AND PILE CAPS AT NEW PIER LOCATIONS AWAY FROM THE CROSS SECTION OF EXISTING FOUNDATIONS.

LANDBRIDGE SUPERSTRUCTURE



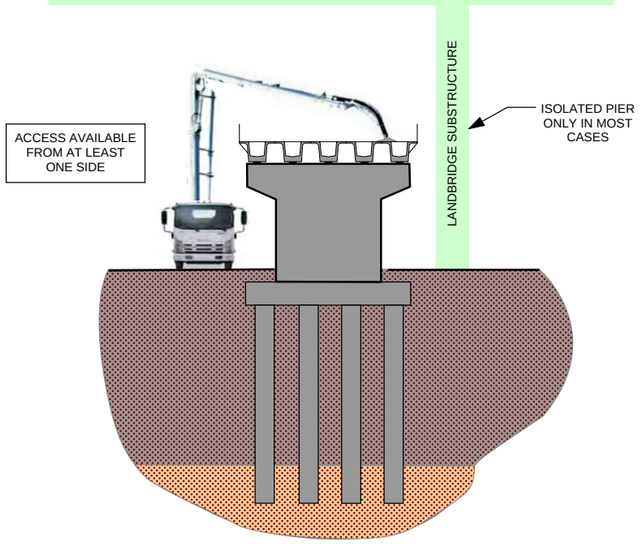
3. POUR NEW RC PIERS FROM THE ON-GRADE ROADWAY

LANDBRIDGE STRUCTURE



4. SUPER-T GIRDERS ARE BROUGHT TO SITE ON TRUCKS AND LIFTED AND POSITIONED VIA A TEMPORARY STEEL GANTRY

LANDBRIDGE STRUCTURE



5. THE INSITU DECK IS POURED FROM THE ON GRADE ROADWAY AND THE ROAD SURFACING IS UNDERTAKEN FROM ON TOP OF THE STRUCTURE.

THE PROPOSED LANDBRIDGE WILL BE STRUCTURALLY INDEPENDENT OF THE WESTERN DISTRIBUTOR STRUCTURE. THE WESTERN DISTRIBUTOR CAN THEREFORE BE DEMOLISHED AND RECONSTRUCTED INDEPENDENTLY.

THIS SCHEMATIC REPRESENTS ONE POTENTIAL MEANS OF DEMOLISHING AND RECONSTRUCTING THE ELEVATED WESTERN DISTRIBUTOR STRUCTURE - SHOULD THIS BE REQUIRED - AFTER THE CONSTRUCTION OF THE PROPOSED LANDBRIDGE AT COCKLE BAY PARK.

AN ALTERNATE SCHEME IS TO CONSTRUCT THE ELEVATED STRUCTURE BY POURING INSITU CONCRETE ON STANDARD FORMWORK FROM THE ON-GRADE LEVEL AS PER THE CONSTRUCTION OF THE CURRENT STRUCTURE.

COCKLE BAY PARK LANDBRIDGE - DEMOLITION AND REPLACEMENT OF THE WESTERN DISTRIBUTOR

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THIS DIAGRAM INDICATES THE APPROXIMATE LOCATIONS OF SUBSTRUCTURE SUPPORTING THE WESTERN DISTRIBUTOR SUPER STRUCTURE OVER THE EXTENT OF THE PROPOSED COCKLE BAY PARK LANDBRIDGE.

COCKLE BAY PARK LANDBRIDGE - DEMOLITION AND REPLACEMENT OF THE WESTERN DISTRIBUTOR

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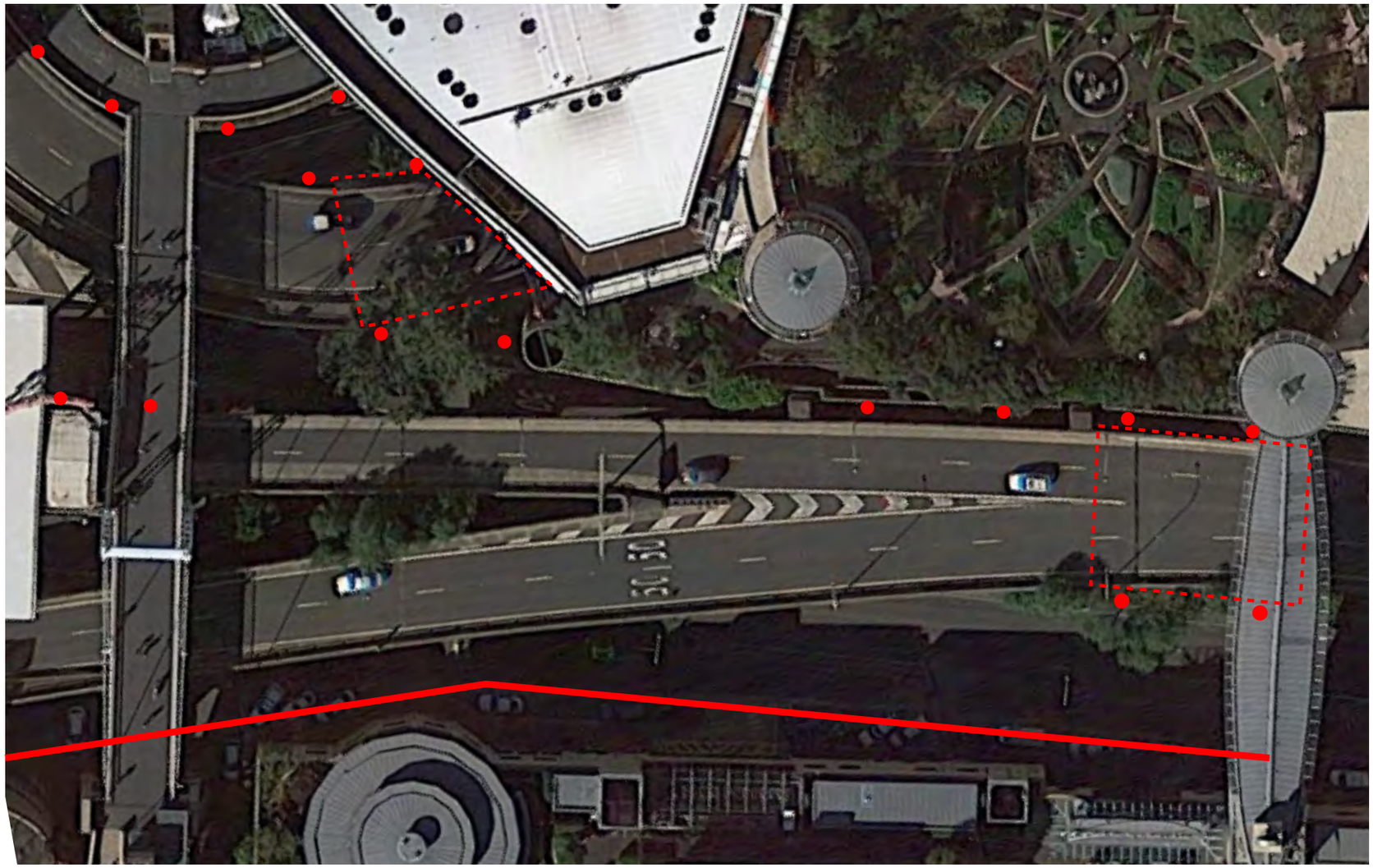

THIS DIAGRAM SHOWS THE LIKELY ZONES (IN RED) TO BE OCCUPIED BY THE LANDBRIDGE OVER THE HEIGHT BETWEEN THE FOUNDATIONS AND SUPERSTRUCTURE. IT INDICATES THAT ANY OBSTRUCTIONS TO DEMOLITION AND REPLACEMENT OF THE WESTERN DISTRIBUTOR OCCUR IN ISOLATION AND ARE VERY LIMITED.

IN THESE REGIONS WITH LANDBRIDGE PIERS ON EITHER SIDE OF THE ROADWAY, THE GIRDER INSTALLATION GANTRY COULD FACILITATE END ON RATHER THAN SIDE ON ERECTION OF PRECAST BEAMS OR THE DECK COULD BE POURED INSITU. THERE WOULD BE NO REQUIREMENT TO MODIFY THE DEMOLITION PROCEDURE OR CONSTRUCTION OF ELEMENTS OTHER THAN THE PRECAST GIRDERS.

COCKLE BAY PARK LANDBRIDGE - DEMOLITION AND REPLACEMENT OF THE WESTERN DISTRIBUTOR

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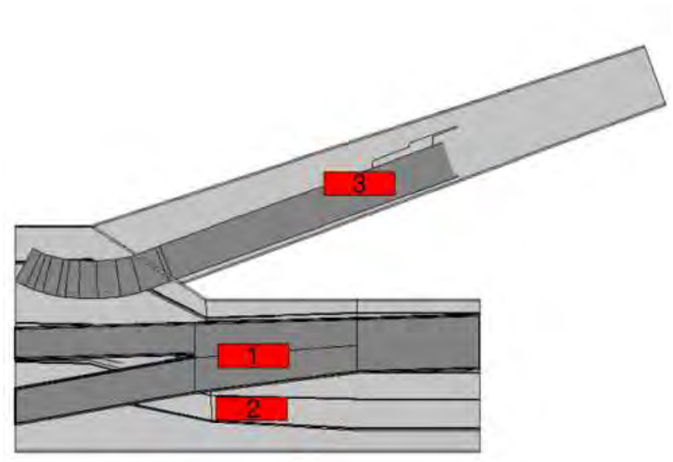
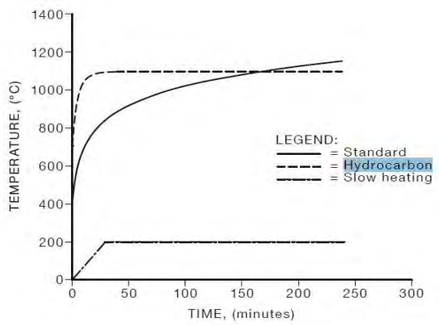
Appendix H
Proposed Concept Design Criteria Report

Cockle Bay Park Redevelopment - Land Bridge Concept Design Criteria

The below criteria has been proposed for RMS review and comment. After the concept design criteria is agreed upon, it is proposed that relevant reports are provided beyond stage 1 State Significant Development Application (SSDA) confirming compliance to stated objectives.

Discipline and Design Item	Design Parameters	Acceptance Criteria	Reference
Fire Safety			

1. Fire Load for Tenability	• Heavy Goods Vehicle (HGV)
	• Peak heat release rate (HRR) 157MW
	• Peak value reached after 14 minutes at which point it remains constant
	• 82% wood pallets, 18% polyurethane plastic
	•
	• Soot yield 0.1g/g
	• Heat transfer: radiation 35%, convection 65%
	• Ambient temperature 20°C
	• Three fire locations to be assessed separately:
	  ○ 1. Mid-length of the enclosure on the elevated Western Distributor viaduct
	  ○ 2. Mid-length of the enclosure on the northbound Harbour St
	  ○ 3. Mid length of the existing Darling Park underpass
	 
		Computational Fluid Dynamics (CFD) assessment and egress modelling to demonstrate tenable conditions such that the Available Safe Egress Time (AEST) is greater than the Required Safe Egress Time (RSET) based on the below criteria:
		• Visibility greater than 10m (2m above the evacuation surface)
		• Temperature less than 60°C (2m above the evacuation surface)
		• Fractional effective dose of toxic gases, FED_{co} less than 0.3
			• Based on findings from the large scale fire test in Runehamar Tunnel in 2003 by Technical Research Institute of Sweden (SP)
			• Buchanan, April 2001

Discipline and Design Item	Design Parameters	Acceptance Criteria	Reference
Fire Safety			
2. Egress Conditions	• Cars approximately 4.9 – 5.2 m in length queuing at 6.7 m centres in all lanes • Average 1.5 people per car • One passenger bus with 50 passengers • Population distribution and travel speeds: 90% adults 1.2m/s, 5% children 0.5m/s, 5% disabled 0.5m/s • Combined cue time and pre-movement time is taken to be 1-4 minutes uniformly distributed over the occupants • Egress path via the existing roadways with safe places to be nominated in conjunction with the assessment • The conditions in non-incident areas such as within the existing Darling Park underpass during a fire incident on the elevated roadway within the new enclosure and vice versa are to be assessed • The ability of the road user to identify their location in the event of a fire incident is to be addressed in the assessment	Computational Fluid Dynamics (CFD) assessment and egress modelling to demonstrate tenable conditions such that the Available Safe Egress Time (AEST) is greater than the Required Safe Egress Time (RSET) based on the below criteria: • Visibility greater than 10m (2m above the evacuation surface) • Temperature less than 60°C (2m above the evacuation surface) • Fractional effective dose of toxic gases, FED_{co} less than 0.3	NFPA 502
3. Emergency Services Response	The access strategy and incident response for emergency services, and the return to service requirements after a fire event are to be workshopped with RMS and the relevant emergency services once they become involved in the design development	To be workshopped with RMS and emergency services	
4. Hydrocarbon Fire Load Event	Fire Resistance Level (FRL) 120/120/120 to the hydrocarbon curve 	Demonstrate that the land bridge structure can avoid collapse and explosive concrete spalling	AS 1530.4: 2014
5. Fire Detection		Under NFPA 502, fire detection is not a mandatory requirement for an enclosure less than 240m long with the exception of a means to stop approaching traffic from entering the underpass. The extent of fire detection is to be agreed between Fire and Rescue NSW (FRNSW), RMS and the Developer during the FER process.	NFPA 502: Table A.7.2
6. Fire Suppression	Provision for FRNSW firefighting connections and means of containment and collection of water required for FRNSW firefighting.	The fire engineering solution proposed above will be provided to demonstrate tenable conditions without the requirement for a fixed suppression system such as deluge. Under NFPA 502, a fixed suppression system is not a mandatory requirement for an enclosure less than 240m long. Demonstration of adequate facility for FRNSW firefighting of the above fire loads including provision of adequate water supply, hydrants etc..	NFPA 502: Table A.7.2

Discipline and Design Item	Design Parameters	Acceptance Criteria	Reference
Fire Safety			
7. Smoke Ventilation	Flow of smoke within the enclosure.	CFD assessment to demonstrate that reliance on natural ventilation will allow tenable conditions to the criteria described in item 1.	Refer to item 1
8. Smoke Flow and Air Temperature Outside the Enclosure	Parameters as described in item 1 except that the fire event occurs at the ends of the enclosure.	CFD assessment to show the flow of smoke as it exits the portals and demonstrate that the air temperature and smoke content at adjacent infrastructure (including the 161 Sussex St underpass) is below limits appropriate to the façade materials and functionality of space during a fire event.	
9. Separation of Land Bridge and 161 Sussex St Underpass	Lighting assessment to encompass the driver journey that includes the adjacent 161 Sussex St underpass in addition to the length of road beneath the proposed land bridge and their approaches. This is in order to demonstrate that the adjacent developments may remain separated and that the parameters and acceptance criteria outlined in item 7 are adequate to assess the interaction in a fire event.	Demonstrate that the lighting conditions over the journey provide acceptable light adaptation between internal and external areas without the need for additional measures between the 161 Sussex St underpass and the land bridge	• AS 1158.5 • RMS specification R158

Discipline and Design Item	Design Parameters	Acceptance Criteria	Reference
Internal Air Quality			
1. Ambient and Vehicle Induced Air Quality Beneath the Land Bridge	Assessment of the following parameters for air quality beneath the land bridge: • Carbon Monoxide (CO) • Nitrogen Dioxide (NO_2) • Visibility $PM_{2.5}$ • Visibility PM_{10} In the following scenarios: • Normal operation: traffic moving at 80km/hr • Congested operation: traffic moving at 40km/hr • Congested operation: traffic moving at 10km/hr • Stationary traffic	Desktop lump analysis (1D analysis) to demonstrate that the combined ambient and vehicle induced air quality is within the following 15 minute averaging period limits as per the World Health Organisation (2000) and the WestConnex specification: • CO 100 mg/m^3 (WHO (2000)) • NO_2 940 μg/m^3 (WestConnex) • $PM_{2.5}$ 1063 μg/m^3 (WestConnex) • PM_{10} 1063 μg/m^3 (WestConnex)	• PIARC - Road tunnels: vehicle emissions and air demand for ventilation, 2012R05EN • World Health Organisation (2000) • WestConnex specification
2. Inputs to Internal Air Quality Assessment	Ambient Conditions: • Mean daily high temperature 30°C • Wind pressure taken as zero as wind would induce a flow and subsequently lower the concentrations of the vehicle emissions • Ambient Air Quality: **Pollutant** / **Averaging period** / **Max** / **Units** NO_2 / 1 hour / 94 / μg/m^3 CO / 8 hour / 1.38 / mg/m^3 CO (calculated) / 1 hour / 2.09 / mg/m^3 PM_{10} / 24 hour / 58.8 / μg/m^3 $PM_{2.5}$ / 24 hour / 49.4 / μg/m^3 Traffic, vehicle and exhaust parameters: • 80% passenger cars, coefficient of drag (C_d) = 0.4, cross-sectional area (A) = 2m^2 • 10% light commercial vehicles (LCV), C_d = 1, A = 3m^2 • 10% heavy goods vehicles (HGV), C_d = 1, A = 7m^2 • Traffic count per lane over 15 minute periods based on guidance provided by PIARC for the given number of lanes, road length and vehicle speed • Average vehicle exhaust diameter, velocity, temperature, density and yield to be calculated in accordance with PIARC guidance based on the traffic parameters described above		• Mean daily high temperature: Bureau of Meteorology Sydney (Observatory Hill) site 066062 2016 • Ambient air quality: 2016 observations at the Rozelle air quality monitoring station. Conversions of the CO averaging period to 1 hour is based on guidance from the regulatory air pollution model AERMOD in Victoria • Traffic, vehicle and exhaust parameters: PIARC - Road tunnels: vehicle emissions and air demand for ventilation, 2012R05EN

Discipline and Design Item	Design Parameters	Acceptance Criteria	Reference
Lighting			
	Lighting design shall consider and address: • Road design speed, sight overhead structure length, see through percentage, and field of view luminance values of the motorist for each carriageway • The driver journey that includes the adjacent 161 Sussex St underpass in addition to the length of road beneath the proposed land bridge and their approaches • Mains failure supply support systems • Emergency lighting	A report outlining the lighting requirements to satisfy the referenced standards to be provided as part of the stage 2 SSDA design. In order to demonstrate the acceptability of the 161 Sussex St underpass and the proposed land bridge remaining separated, the assessment of the driver journey incorporating 161 Sussex St and the roads beneath the proposed land bridge will be undertaken as part of the stage 1 SSDA fire safety assessment.	• AS 1158.5 • RMS specification R158 • AS 2293 • Building Code of Australia

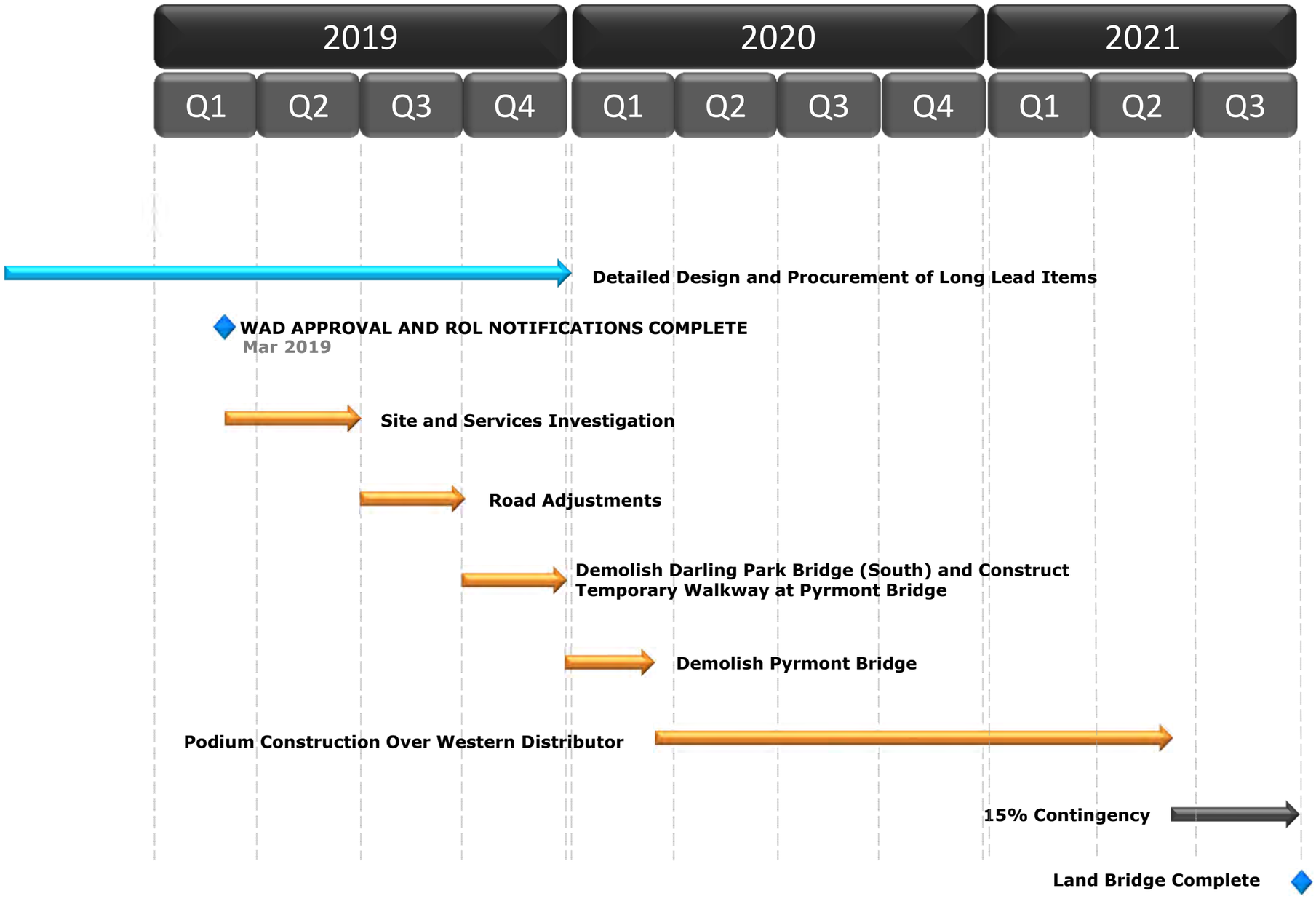
Discipline and Design Item	Design Parameters	Acceptance Criteria	Reference
Safety and Security			
	To ensure appropriate controls regarding monitoring, security and safety of users of the space we propose to undertake a Crime Prevention Through Environmental Design (CPTED) assessment of the existing area as well as in the context of what is being proposed for the whole redevelopment precinct. The review will address the key monitoring, safety and security risks with respect to crime prevention theories including Natural Surveillance, Natural Access Control and Territorial Reinforcement. This assessment, report and key recommendations will be undertaken in consultation with RMS, FRNSW, Police, PropertyNSW, Cockle Bay Wharf security and other key stakeholders.	The deliverable will be a report outlining the traffic monitoring, public safety, crime prevention theories and the assessment methodology, as well as the findings and recommendations resulting from the review. Agreed recommendations will be incorporated into the Stage 2 SSDA design.	

Discipline and Design Item	Design Parameters	Acceptance Criteria	Reference
Structure			
1. Design Standards	Land bridge superstructure, substructure and foundations immediately adjacent and over the Western Distributor	Compliance with referenced standards	• AS 5100: 2017 Series Bridge design • AS 3845.1: 2015 Road Safety Barrier Systems and Devices - Road safety barrier systems
	General project standards	Compliance with referenced standards	• AS/NZS 1170.0: 2002 Structural Design Actions - General principles • AS/NZS 1170.1: 2002 Structural Design Actions - Permanent, imposed and other actions • AS/NZS 1170.2 Structural Design Actions - Wind actions • AS 1170.4: 2007 Structural Design Actions - Earthquake actions in Australia • AS 2159: 2009 Piling - Design and installation • AS 2327.1: 2003 Composite Structures - Simply supported beams • AS 3600: 2009 Concrete Structures • AS 3700: 2011 Masonry structures • AS 4100: 1998 Steel Structures • AS 4678: 2002 Earth Retaining Structures • Building Code of Australia: 2016
2. Design Life	• 100 years for land bridge superstructure, substructure and foundations immediately adjacent and over the Western Distributor • 50 years for other structures	Compliance with referenced standards	• 100 year design life: AS5100:2017 • 50 year design life: AS 3600: 2009, AS 3700: 2011, AS 4100: 1998
3. Durability	Structural durability consistent with specified design life Exposure classification: external areas B1, in ground B2.	Compliance with referenced standards	• 100 year design life: AS5100:2017 • 50 year design life: AS 3600: 2009
4. Structural Fire Resistance	Structural adequacy, integrity and insulation	To be confirmed with fire engineering study. Provisionally, for land bridge superstructure and substructure immediately adjacent and over the Western Distributor: 240 minutes to the standard time/temperature curve specified in AS 1530.4.	AS 1530.4:2005

Discipline and Design Item	Design Parameters	Acceptance Criteria	Reference
Structure			
5. Foundations adjacent to the Western Distributor		New structure will be supported on pad footings or piled foundations outside the zone of influence for the existing RMS foundations or placed to not adversely affect the structural integrity of the existing structure.	• RMS GTD 2012/001 • AS 2159: 2009 • AS4678: 2002 • AS 5100.3: 2017 • AS 3600: 2009
6. Interaction with Rail and Tunnel Easements	Investigations show that no current or planned future tunnel corridors run beneath the proposed redevelopment footprint.		

Appendix I
Preliminary Construction Programme

COCKLE BAY WHARF - LAND BRIDGE
INDICATIVE PHASE PROGRAM



DP4-CMP-SK31
LAND BRIDGE
PRELIMINARY PROGRAM

MULTIPLEX

The GPT Group

Brookfield

AMP CAPITAL

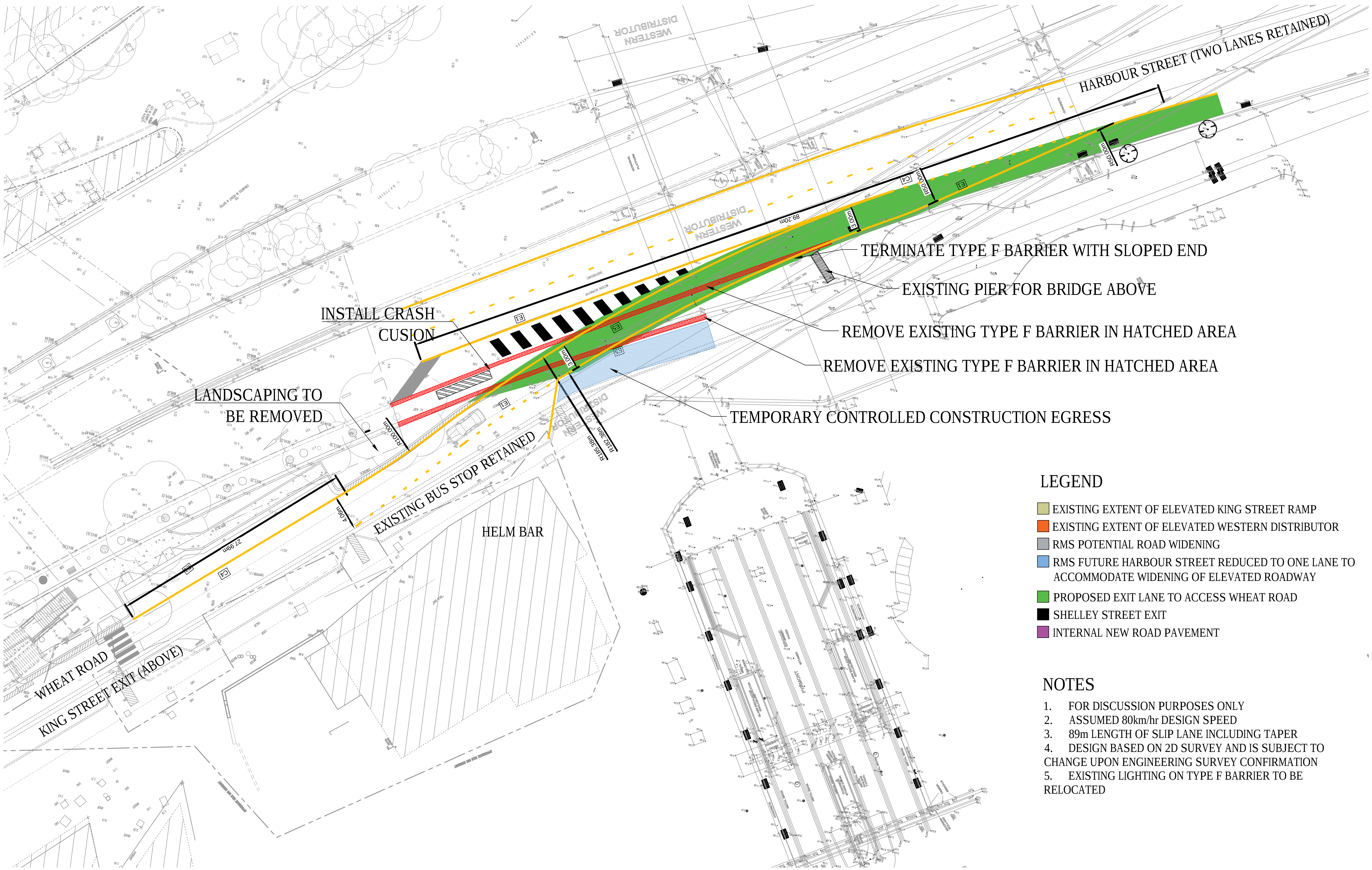
Project
Darling Park 4

Drawing
Land Bridge
Preliminary Program

Drawing ID
DP4-CMP-SK31

Date
7/6/2017

Appendix J
Temporary Wheat Rd Diversion



LEGEND

- EXISTING EXTENT OF ELEVATED KING STREET RAMP
- EXISTING EXTENT OF ELEVATED WESTERN DISTRIBUTOR
- RMS POTENTIAL ROAD WIDENING
- RMS FUTURE HARBOUR STREET REDUCED TO ONE LANE TO ACCOMMODATE WIDENING OF ELEVATED ROADWAY
- PROPOSED EXIT LANE TO ACCESS WHEAT ROAD
- SHELLEY STREET EXIT
- INTERNAL NEW ROAD PAVEMENT

NOTES

1. FOR DISCUSSION PURPOSES ONLY
2. ASSUMED 80km/hr DESIGN SPEED
3. 89m LENGTH OF SLIP LANE INCLUDING TAPER
4. DESIGN BASED ON 2D SURVEY AND IS SUBJECT TO CHANGE UPON ENGINEERING SURVEY CONFIRMATION
5. EXISTING LIGHTING ON TYPE F BARRIER TO BE RELOCATED

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CLIENT

REV	DATE	REVISION DETAILS	APPROVED
A	03.08.17	DRAFT FOR COMMENT	MO
B	07.08.17	CONSTRUCTION EGRESS ADDED	MO
C	10.08.17	HATCH ADDED	MO

SCALE	SIZE
1:200	A1

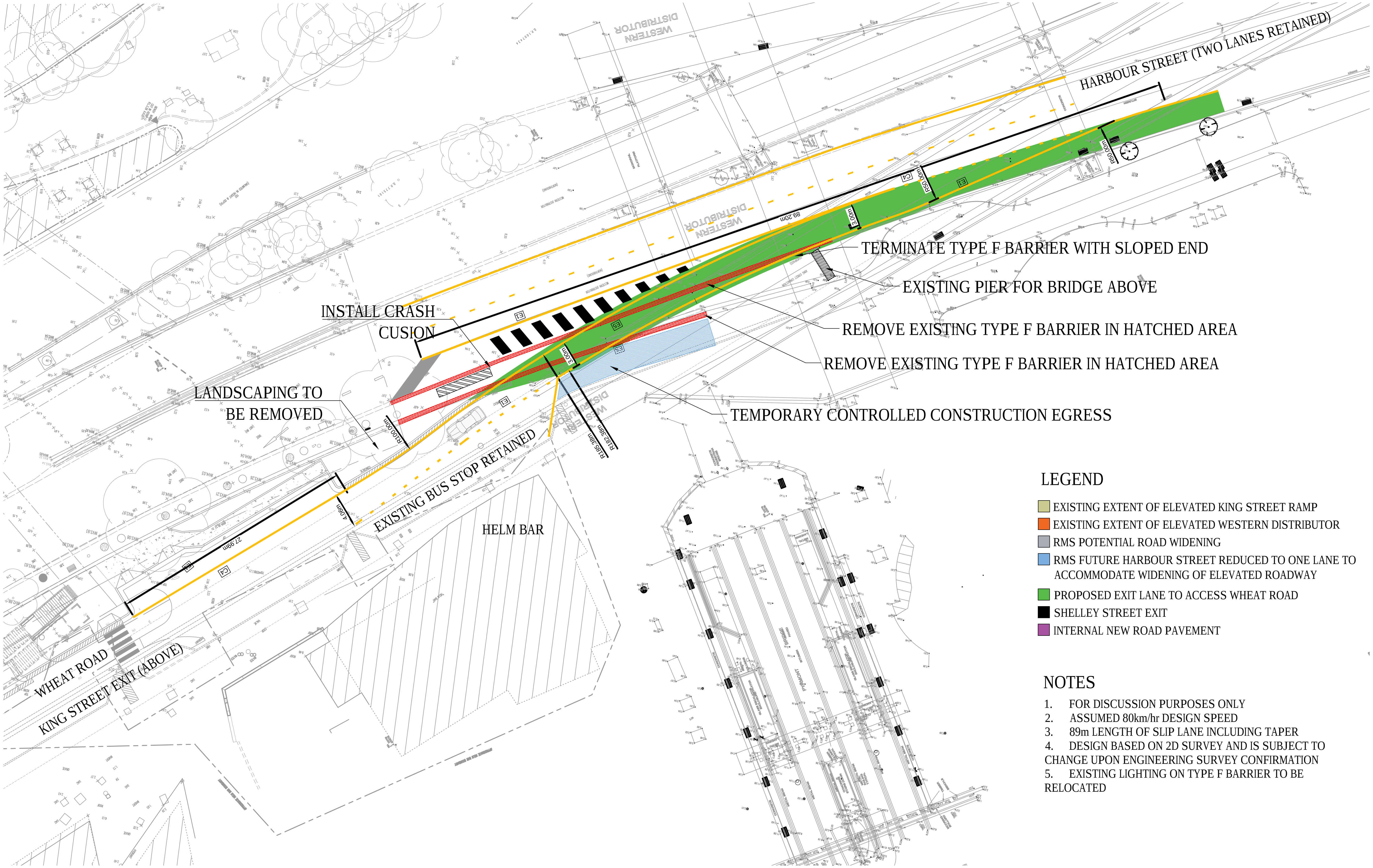
DRAWN: NO
DESIGNED: NO
REVIEWED

NOT FOR CONSTRUCTION
APPROVED
DATE

PROJECT: COCKLE BAY WHARF, DARLING HARBOUR
TITLE: ROAD WORKS WHEAT ROAD DIVERSION TEMPORARY SLIP LANE OPTION A

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	253427	002	SK	RD	0004	c

Appendix K
Harbour St Access



LEGEND

- EXISTING EXTENT OF ELEVATED KING STREET RAMP
- EXISTING EXTENT OF ELEVATED WESTERN DISTRIBUTOR
- RMS POTENTIAL ROAD WIDENING
- RMS FUTURE HARBOUR STREET REDUCED TO ONE LANE TO ACCOMMODATE WIDENING OF ELEVATED ROADWAY
- PROPOSED EXIT LANE TO ACCESS WHEAT ROAD
- SHELLEY STREET EXIT
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2. ASSUMED 80km/hr DESIGN SPEED
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5. EXISTING LIGHTING ON TYPE F BARRIER TO BE RELOCATED

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CLIENT

REV	DATE	REVISION DETAILS	APPROVED
A	03.08.17	DRAFT FOR COMMENT	MO
B	07.08.17	CONSTRUCTION EGRESS ADDED	MO
C	10.08.17	HATCH ADDED	MO

SCALE: 1:200 SIZE: A1
DRAWN: NO
DESIGNED: NO
REVIEWED

NOT FOR CONSTRUCTION
APPROVED
DATE

PROJECT: COCKLE BAY WHARF, DARLING HARBOUR
TITLE: ROAD WORKS WHEAT ROAD DIVERSION TEMPORARY SLIP LANE OPTION A

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
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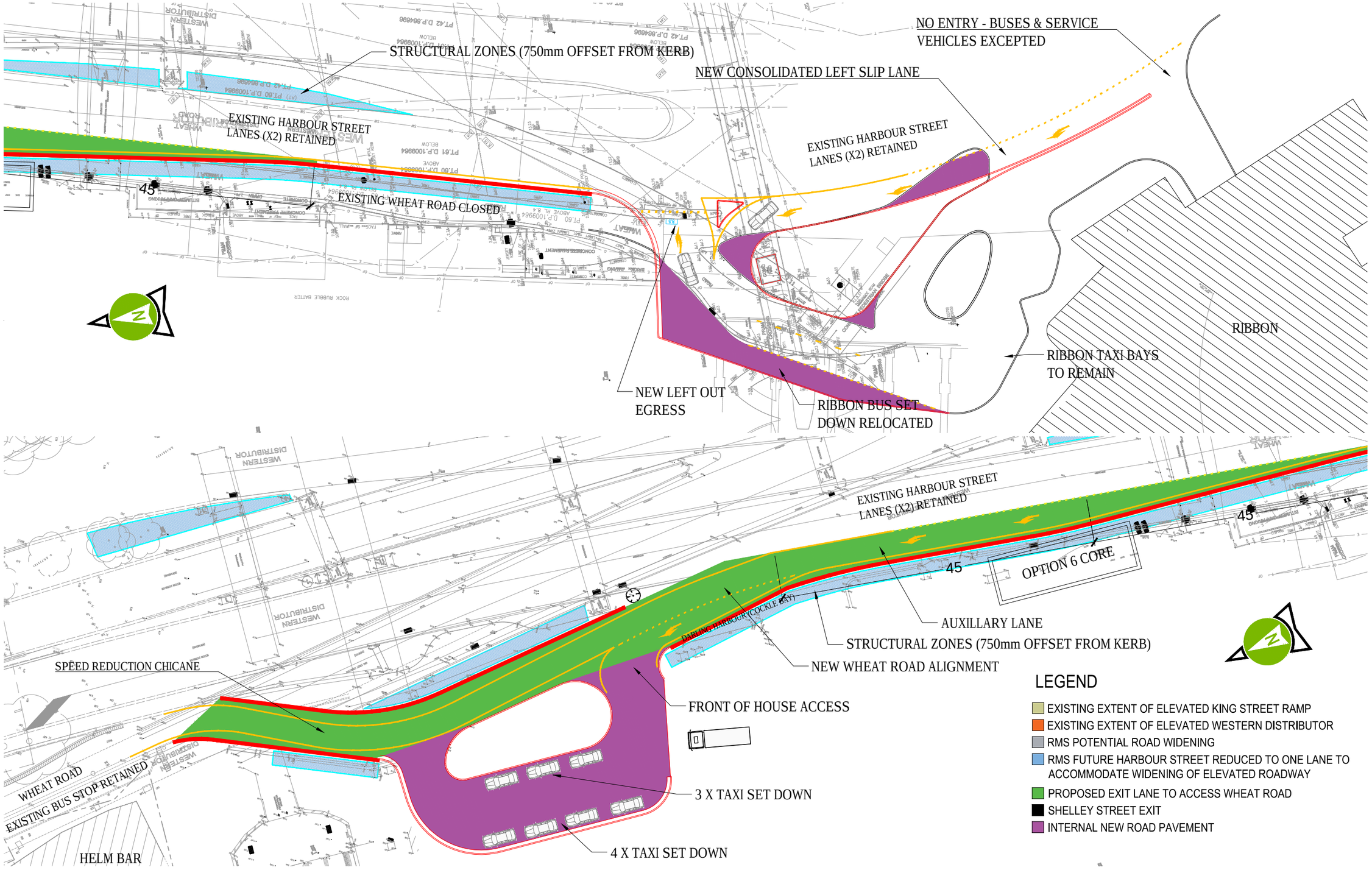

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CLIENT

REV	DATE	REVISION DETAILS	APPROVED
A	07.08.17	DRAFT FOR COMMENT	MO
B	10.08.17	NOTES AND LEGEND	MO

SCALE	SIZE
1:250	A1

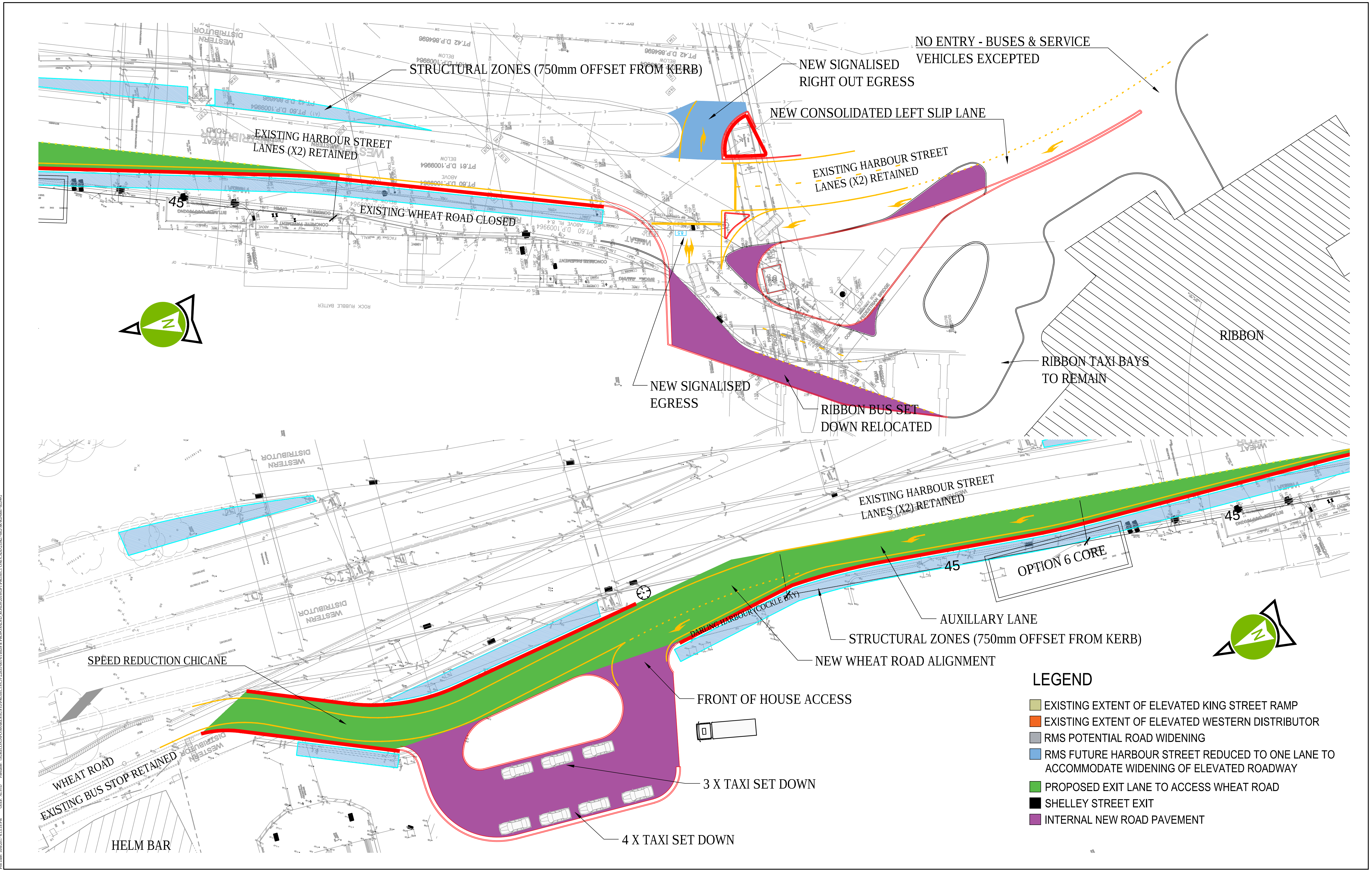
DRAWN: NO
DESIGNED: NO
REVIEWED:

NOT FOR CONSTRUCTION
APPROVED
DATE

PROJECT: COCKLE BAY WHARF
DARLING HARBOUR

TITLE: ROAD WORKS
HARBOUR STREET ACCESS
BASE CASE + OPTION 1 (NON SIGNALISED) LEFT IN/OUT

DRAWING No.: PROJECT No. 253427 – WBS 002 – TYPE SK – DISC RD – NUMBER 0006 – REV B



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CLIENT

REV	DATE	REVISION DETAILS	APPROVED
A	07.08.17	DRAFT FOR COMMENT	MO
B	10.08.17	NOTES AND LEGEND	MO

SCALE	SIZE
1:250	A1

DRAWN: NO
DESIGNED: NO
REVIEWED:

NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: COCKLE BAY WHARF DARLING HARBOUR

TITLE: ROAD WORKS HARBOUR STREET ACCESS BASE CASE + OPTION 2 (SIGNALISED) LEFT/RIGHT OUT

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
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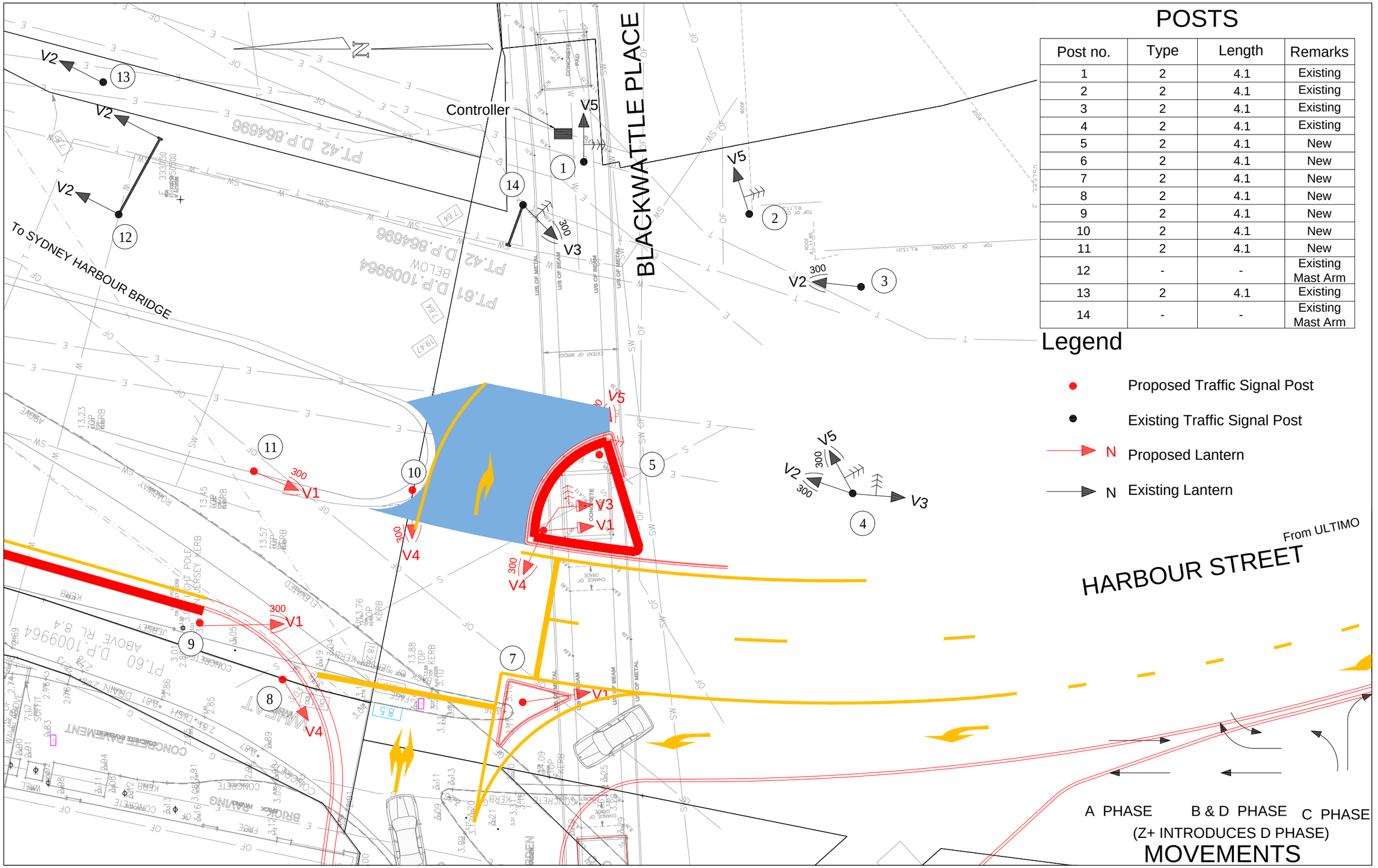

POSTS

Post no.	Type	Length	Remarks
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2	2	4.1	Existing
3	2	4.1	Existing
4	2	4.1	Existing
5	2	4.1	New
6	2	4.1	New
7	2	4.1	New
8	2	4.1	New
9	2	4.1	New
10	2	4.1	New
11	2	4.1	New
12	-	-	Existing Mast Arm
13	2	4.1	Existing
14	-	-	Existing Mast Arm

Legend

- Proposed Traffic Signal Post
- Existing Traffic Signal Post
- N Proposed Lantern
- N Existing Lantern

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CLIENT

REV	DATE	REVISION DETAILS	APPROVED
A	02.08.17	DRAFT FOR COMMENT	MH
B	08.08.17	DRAFT FOR COMMENT	MH

SCALE	SIZE
1:100	A1

DRAWN: S THAPA
DESIGNED: M HENAWAY
REVIEWED:

CONCEPT DESIGN
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: COCKLE BAY DEVELOPMENT

TITLE: CONCEPT TRAFFIC SIGNALS AT HARBOUR STREET ULTIMO

DRAWING No.: PROJECT No. 253427 - WBS 002 - TYPE SK - DISC RD - NUMBER 0003 - REV B

Appendix L
RMS Submissions Matrix

COCKLE BAY WHARF REDEVELOPMENT

DATED 21st SEPTEMBER 2017

Roads and Maritime Services: Key issues and contact log

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C

Running sheet to address and agree actions to RMS submission to the Stage 1 DA.
SSD7684 - Staged redevelopment of Cockle Bay Wharf
241-249 Wheat Road, Cockle Bay Darling Harbour

RMS contact: **Adam Berry** - Principal Network Manager CBD & East Precinct: Network Sydney
via: Angela Frew 02 8849 2041 or at development.sydney@rms.nsw.gov.au

Thelem ITEM	RMS Item	ISSUE	Required to Close out Stage 1 DA - Y or N	RMS Agreed Status	STATUS
		THE PROJECT: RMS- issue requiring consideration, assessment and resolution.			
1	a)	**Closure of the Western Distributor** - the Western Distributor is critical transport infrastructure. Roads and Maritime will not permit the Western Distributor to be closed to enable construction of the Project including the Podium over the Western Distributor. The proponents will need to properly demonstrate how the Project can be safely and efficiently constructed over the Western Distributor without closure or interruption of traffic flow to Roads and Maritime satisfaction.	Y	IN meeting with RMS representatives on 29th May, it was agreed that revised designs were to be prepared to reduce piling/ columns affecting Western Distributor future alignment and necessary nightworks. A Pro's & Con's analysis was also provided for two options: Pier/ Fewer Piers. It was acknowledged by RMS that closures would be required but would be subject to coordinated planning. A presentation of these options was provided to RMS on 18th July. Smart Motorways were initially concerned that the pier locations would impinge with their potential expansion corridors, however it was confirmed by CBW team that the pier locations would be outside the face of the existing barriers/ kerbs. It was agreed that the concept design would be modified to better clarify CBW compliance with this requirement. When initial construction planning is available, CBRW to have coordination meeting with David, Giovanni and Grant from RMS. Issue has been coordinated/ resolved to RMS/ CBW mutual satisfaction. Final designs to better reflect agreed intent. RMS to advise if any remaining comments or concerns. An indicative construction programme was provided (Refer Appendix I)	C
2	b)	**Fire Safety** - the Project will have the effect of creating a "tunnel" underneath the Podium. The Proponent will need to demonstrate that there is adequate provision for fire safety underneath the podium having regard to the traffic flow. This provision may, for example, include fire sprinklers and other infrastructure installed as part of the Project.	Y	RMS has agreed that a Performance based assessment is appropriate. In meeting with RMS on 7th June, it was advised that RMS would like CBW to clearly establish the principles of design for this landbridge. RMS advised that there is an unlikely risk that RMS would consider that the whole of the overpasses could be considered an operational tunnel. A Table summarising the design criteria and Principles for the landbridge was developed and submitted to RMS on 4th July 2017 and again on 28th July 2017. We have received verbal advise from RMS that the Design Criteria for the Landbridge appears acceptable - in Principle, for further design development.	C

3	c)	**Security** - the proponent will need to demonstrate to Roads and Maritime satisfaction that the Project does not pose an unacceptable security risk.	Y	A CPTED Assessment will be undertaken after the Stage 1 DA approval in preparation for the developed Stage 2 DA Approval. This will enable the outcomes of the architectural design competition to be appropriately addressed.	C
4	d)	**Piering Options** - Roads and Maritime has asked the proponent to identify where the piers for the Podium are to be located in relation to the Western Distributor. Roads and Maritime has requested a "no piers" in addition to the proposed "piers" option be investigated and considered. The location of the piers for the Podium in relation to the Western Distributor is required to enable the practical consideration of matters relating to structural integrity, accessibility, safety, security and maintenance, repair, augmentation and replacement. The development application should not be determined until this information has been provided and addressed to Roads and Maritime satisfaction.	Y	CBW presented a "No piers" design option for the Western Distributor corridor. Initial advice from RMS was that the 'no piers' option within the Western Distributor expansion zone would be the preferred option. As requested, concept designs were issued for both options and were presented to RMS on 18th July, 2017. Smart Motorways were initially concerned that the pier locations would impinge with their potential expansion corridors, however it was confirmed by CBW team that the pier locations would be outside the face of the existing barriers/ kerbs. It was agreed that the concept design would be modified to better clarify CBW compliance with this requirement. When initial construction planning is available, CBRW to have coordination meeting with David, Giovanni and Grant from RMS. Issue has been coordinated/ resolved to RMS/ CBW mutual satisfaction. Final designs in re-submission will better reflect this agreed intent. RMS to advise if any remaining comments or concerns.	C
5	e)	**Access for Maintenance and Repair** - the proponent will need to be able to demonstrate to Roads and Maritime satisfaction that the Podium will not unreasonably interfere with Roads and Maritime ongoing ability to access the Western Distributor and its surrounds for the purposes of maintenance, repair, augmentation and, if necessary, replacement of the Western Distributor.	Y	RMS require minimum clearances for maintenance equipment around certain bridge structures. RMS ideally prefer to not have anything built within 2-3m zone of WD. However, there can be exceptions in isolated areas providing access can still be available to the structures. RMS are OK with isolated columns/ piers being located adjacent to the existing Western Distributor. CBW prepared and submitted revised concept designs to keep columns/ piers 1,000mm from face of existing RMS structures to enable isolated access at to the pier/ column. Any 'walls' that are located along the elevated Western Distributor will ideally be kept 2m back from above ground RMS Western Distributor structures for maintenance purposes. CBW also submitted a demolition & reconstruction plan for potential future demolition and reconstruction of the WD to demonstrate that it can be done after the development is completed.	C
6	f)	**Wheat Road** - the proponent will need to provide further details of the arrangements to be made around the Site, particularly around Wheat Road, to enable safe and efficient vehicular access to the Project without unreasonably interfering with traffic flows. Roads and Maritime notes that there is currently an approved development for the IMAX Theatre which contemplates potential changes to these roads. Any proposed changes in this development application need to be consistent with any changes approved as part of the IMAX Theatre redevelopment (SDD 7388). The proponent will need to ensure that access, including emergency access, is maintained at all times to the Cross City Tunnel assets including in and around the ventilation stack, to the satisfaction of Roads and Maritime and the Cross City Tunnel operators. In this regard, the Project contemplates the modification of the Harbour Street/Wheat Road and Blackwattle Place intersection to allow left and right turn movements on to Harbour Street, however, the modifications contemplated by the Project would unreasonably compromise through traffic movements in this area and the traffic volumes contemplated by the Project do not warrant traffic control lights. The proposed intersection arrangement should be investigated from a road safety perspective and details of how taxi, pedestrian and vehicle movements will be affected under the proposed modifications and how the changes should be maintained should be considered.	Y	At coordination meeting with RMS on Friday 2nd June 17, it was proposed by RMS: 1. No traffic lights will be approved at Wheat Rd and Left turn only, 2. RMS are concerned with aspects of the Ribbon road access/ egress network. Colston Budd Rogers & Kafes (CBRK) agreed to provide some advice on how this could be improved. However, this is not Cockle Bay Wharf (CBW) Development's issue to resolve, 3. Vehicle turning paths to be further reviewed and shown, 4. Zones for appropriate taxi and bus bay concepts to be shown on a drawing by CBRK, 5. Pedestrian access down Druitt St could be upgraded in partnership with other agencies - To be further discussed with TfNSW. CBW can only do capital upgrades pertaining to areas surrounding the CBW development. At a subsequent coordination meeting with RMS on the 29th August, an integrated precinct plan was presented that provided future opportunities for Smart Motorways; The Ribbon Development and Cockle Bay Park. This proposal was met with initial positive feedback	O

7	g)	**Structural Integrity** - the proponent will need to demonstrate that the Project will not impact on the structural integrity of the Western Distributor and will be designed to meet all relevant safety requirements for the Western Distributor including natural disasters.	Y	Agreed. Structural Engineers, Enstruct will be designing pads and pier footings socketed into rock that comply fully with the RMS guidelines pertaining to inground structures. In design development review, RMS will be concerned about structural stability of their existing roads during the piering and pad footing excavations. Structural Engineer (Enstruct) will need to demonstrate that these structures will not be impacted.	C
8	h)	**Constructability** - the proponent will need to be able to provide details of how the Podium is to be constructed over the Western Distributor to ensure the above issues are addressed.	Y	Construction Planning concept plans were prepared and submitted to RMS. These have been refined based on the fewer piers/ columns options. A presentation to RMS was held on 18th July. There was no further feedback/ requests from RMS.	C
9	I)	**Responsibility** - the proponent will need to demonstrate to Roads and Maritime satisfaction that it will take long term responsibility for the elements of the Project which interface with Roads and Maritime infrastructure to Roads and Maritime satisfaction to ensure that the structural integrity and Roads and Maritime ability to access the Western Distributor for maintenance, repair, augmentation and replacement is not compromised.	Y	Agreed. CBW to prepare a maintenance deed during the WAD period for RMS approval. This maintenance deed would clarify how CBW will maintain the landbridge structure while minimising impact on road use. This would include approximately 2 Yearly structural inspection and safety certification and meeting appropriate RMS guidelines. CBW should also prepare a demolition & reconstruction plan for potential future demolition and reconstruction of the WD to demonstrate that it can be done after the development is completed.	C
10	j)	**Works Authorisation Deed** - the proponent will need to enter into a works authorisation deed with Roads and Maritime relating to the construction of the Project to ensure that the Project is constructed consistently with Roads and Maritime requirements and to Roads and Maritime satisfaction and that the above issues are appropriately addressed.	N: required prior to Construction	Agreed. We will prepare the draft WAD in consultation with RMS after the Stage 1 DA Approval and during the Stage 2 Development Application period. It would ideally be finalised and approved within 4 weeks after the planning approval.	C
11		In any event, Roads and Maritime is of the view that no construction certificate for any part of the Project should be released until such time that the detailed design plans of the structure over the Western Distributor and construction methodology are submitted to and approved by Roads and Maritime.	Note.	Agreed	C
		Schedule A.			
		Design and Construction of the Project			
12	1	Clearances from WD to provide access for inspection and maintenance..	N	Refer 5e), above and see design guideline/ diagram in section.	C
13	2	RMS 3m rule	N	Refer 5e), above	C
14	3	Integrity and Serviceability by qualified Structural and Geotech engineers.	N	Agreed Stage 2	C
15	4	D&C to RMS Technical Direction GTD 2012/001	N	Agreed. Stage 2	C
16	5	Geotech and structural investigation report required.	N	Agreed. Stage 2	C
17	6	RMS 'any time' access	N	Refer 5e), above	C
18	7	RMS access for propping or jacking to joints and bearing locations for inspection, repair or replacement.	N	Refer 5e), above	C
19	8	Piers' - 'No Piers'	N	Refer 4d), above	C
		ROAD SAFETY			
20	9	Fire protection and Exhaust System. Consultation with RMS required PRIOR to the issue of a CC.	N	Refer status in 2b), above	
21	10	Air Quality assessment. Include impacts on CCT.	Y	Refer status in 2b) above	
22	11	External facades re Vandalism	N		
23	12	Façade reflectivity	N		
24	13	Prevention of Falling Objects	N		

		ACCESS			
25	14	RMS access	N	Refer status in 5e) above	
26	15	Additional Strengthening - RMS maintenance	N	Refer status in 5e) above	
27	16	Access for RMS inspection, maintenance and rehab works.	N	Refer status in 5e) above	
28	17	RMS access during construction.	N	Refer status in 5e) above	
		ADDITIONAL REQUIREMENTS			
29	18	WAD	N	Refer 10j), above	
30	19	Reports prior to Construction.	N	Refer 10j), above	
31	20	Impact of construction on the WD.	N	Refer 10j), above	
32	21	Impact of construction on the WD.	N	Refer 10j), above	
33	22	Construction Traffic Management Plan (CTMP) required PRIOR to issue of CC.	N	Refer 10j), above	
		OPERATION and MAINTENANCE of the PROJECT			
34	23	Emergency Response Plan - RMS and Minister required PRIOR to issue of CC.	N		
35	24	Access required by RMS.	N		
		Alterations to or Demolition of the Project.			
36	25	Alt's and Add's to include RMS approval	N		
		Vehicle Access to the Site			
37	26	a) RMS concerns re Harbour/Wheat/Blackwattle intersection	Y	Refer 6f), above	
		b) Details re trip distribution	Y	Refer 6f), above	
		c) Area assessment for queuing vehicles to Harbour St on Wheat Road	Y	Refer 6f), above	
		d) Provide future electronic modelling to RMS	Y	Refer 6f), above	
		e) Road safety w.r.t. Imax project??	Y	Refer 6f), above	
		f) Turn paths required	Y	Refer 6f), above	
		g) Details required for taxi rank, service vehicle loading within Wheat Road	Y	Refer 6f), above	
		h) Pedestrian accessibility	Y		
38		Signage	N		

COCKLE BAY WHARF REDEVELOPMENT

DATED 21st SEPTEMBER 2017

Transport for NSW - Key Comments and recommendations received and extracted from TfNSW Letter dated 23/3/17

O
C

SSD7684 - Staged redevelopment of Cockle Bay Wharf

TfNSW contact:

Thelem ITEM	TfNSW Item	ISSUE	Required to Close out Stage 1 DA -	TfNSW Agreed Status	STATUS
		THE PROJECT: TfNSW - TAB A _ Key comments on the DA requiring consideration, assessment and resolution.			
1	a)	**Future Rail Corridor**			
		The proposed development is located within the future CBD Rail Link (CBDRL) corridor. There may be impacts on the structural integrity and the safe, effective operation and maintenance of the CBDRL. The placing of any foundations, other structures and building loads in or near the proposed rail alignment would affect the structural integrity and operation of the CBDRL. As this is a SSD application the provisions of Clause 88 of State Environmental Planning Policy (Infrastructure) 2007 (the ISEPP) do not apply. However, the proposal has been assessed in accordance with the provision of the ISEPP, being: (a) the practicability and cost of carrying out rail expansion projects on the land in the future; (b) without limiting paragraph (a), the structural integrity or safety of, or ability to operate, such a project; and (c) without limiting paragraph (a), the land acquisition costs and the costs of construction, operation or maintenance of such a project. **<u>TfNSW Recommendation</u>** TfNSW advises that Sydney Trains as the relevant "Rail Authority" under the provisions of the ISEPP will provide a separate response with relevant conditions of consent.		Documents Interim Rail Corridor CBD Rail Link & CBD Metro Map 6 dated October 2009 and Interim Rail Corridor CBD Rail Link & CBD Metro Map 7 dated October 2009 from the Department of Planning website show a future rail corridor proposed for the CBD Rail Link (CBDRL) running North-South beneath Sussex St to the East of the CBW development site. Upon inspection of the proposed route neither the CBW podium/tower structure nor the Western Distributor Land Bridge (pedestrian podium) are located within a zone of influence that would impact the structural integrity or operation of the CBDRL. Refer to ENS-SK-6100(01). This is consistent with advice from Multiplex regarding the approvals process and construction of the 4 Points Project, which is located closer to the easement. The proposed development does include a footbridge which crosses the easement, however, this structure's impact would be incidental compared to the existing building loads already imposed on the easement.	C

2	b)	**Impacts on Western Distributor and Cross City Tunnel**			
		The project involves development over and around part of the Western Distributor adjacent to 241- 249 Wheat Road, Cockle Bay. The development includes the construction of a large "land bridge", being a concrete podium structure (Podium), to be built over the Western Distributor. The structure will need to be supported with piers located within or adjacent to the area of the Western Distributor. The Project also has the potential to impact on the Cross City Tunnel and the Cross City Tunnel assets (including the ventilation stack). There may be potential impacts of the proposed development on the Western Distributor in particular access to maintenance activities, road safety, structural integrity and Western Distributor operation. **TfNSW Recommendation** TfNSW advises that Roads and Maritime Services will provide a separate response and requests that the applicant addresses the issues raised by Roads and Maritime Services in their response to submissions in consultation with Roads and Maritime Services and the CBD Coordination Office.		Proposed CBW development structure will be supported on piled foundations or pad footings that will be placed to not adversely affect the structural integrity of the existing Western Distributor structure. The CBW development team have undertaken detailed planning sessions with RMS in order to establish the design criteria required to ensure safe Western Distributor operation and future access for maintenance activities. Concept design on how this will be achieved have been prepared and submitted to them to their satisfaction (in principle). Landbridge design development will be conducted in consultation with the relevant authorities when addressing any latent in ground conditions (services, structure and the like). Investigations show no impact on the Cross City Tunnel or the Cross City Tunnel ventilation stack. Refer to ENS-SK-6100(01). It is proposed that CBW redevelopment team will continue developing design in concert with RMS guidelines, RMS Smart Motorways, RMS Maintenance Division and TfNSW Metro division.	C
3	c)	**Wheat Road/Harbour Street/Blackwattle Place Intersection**			
		The Traffic Report states that as part of the proposal, Wheat Road would be made two-way and the Cockle Bay connection of Wheat Road to Harbour Street would be reconfigured with modifications to the existing Harbour St/Blackwattle Place intersection traffic signals to allow egress from Wheat Road onto Harbour Street. It is noted that: • The Harbour St/Blackwattle Place intersection currently experiences significant levels of congestion with queues extending both directions of Harbour Street especially during peak periods. Vehicles travelling northbound on Harbour Street queue back to Bathurst Street; and • The introduction of an additional phase for the Harbour St/Blackwattle Place intersection would further deteriorate the performance of this intersection and have the potential to impact on Harbour Street operation. **TfNSW Recommendation** TfNSW advises that Roads and Maritime Services will provide a separate response and requests that the applicant addresses the issues raised by Roads and Maritime Services in their response to submissions in consultation with Roads and Maritime Services and the CBD Coordination Office.	Y	Concept designs for the Wheat Rd/ Harbour Rd solution have evolved. This has been done with a better understanding of requirements to improve access/ Egress from the Ribbon project, planning for the RMS Smart Motorways projects, requirements of RMS/ TfNSW Metro to improve bus and Taxi parking bays. The revised concept and intersection panning will be presented to RMS and TfNSW Metro in the next 2 weeks.	C

4	d)	**Interaction with IMAX Theatre Redevelopment**			
		It is noted that an approved development for the IMAX Theatre (SSD 7388) includes potential changes to Wheat Road and its intersection with Harbour Street. The subject proposal would have the potential to impact on the operation of the IMAX Theatre redevelopment, in particular Porte Coach ere and car stacker operation and safety of vehicle movements along Wheat Road. **TfNSW Recommendation** TfNSW advises that: • Any proposed changes to Wheat Road and the Wheat Road/Harbour Street intersection as part of the subject proposal need to be consistent with the approved IMAX Theatre redevelopment (SSD 7388) proposal; • Any proposed changes to Wheat Road and the Wheat Road/Harbour Street intersection investigated by undertaking a road safety audit by an independent TfNSW accredited road safety auditor; and • The applicant ensures that traffic movements from vehicles associated with the operation of the IMAX Theatre redevelopment, particularly northbound traffic on Wheat Road, are not impacted.		Concept designs for the Wheat Rd/ Harbour Rd solution have evolved. This has been done with a better understanding of requirements to improve access/ Egress from the Ribbon project, planning for the RMS Smart Motorways projects, requirements of RMS/ TfNSW Metro to improve bus and Taxi parking bays. The revised concept and intersection planning has been presented to RMS, TfNSW and coordinated with The Ribbon development	C
5	e)	**Traffic Generation and Design and Operation of Realigned Wheat Road**			
		A concept plan of the Wheat Road realignment has been included as part of the Traffic Report however detailed information on the design, capacity and operation of the realigned Wheat Road, including coach/taxi/private vehicle set down/pick up, off street car parking, public disability parking and loading and servicing has not been provided. Further, no swept paths have been provided for vehicles associated with the proposed development. The Traffic Report identifies that the existing development generates some 53 and 69 vehicles in the AM and PM peak hour respectively, including trucks, coaches, taxis and private vehicles. For the purposes of assessing the traffic effects of the proposed development the Traffic Report assumes a 50% increase in existing traffic generation, equating to an additional 85 and 100 vehicles in the AM and PM peak hour, respectively. **TfNSW Recommendation** TfNSW requests that the applicant:		Investigations show no impact on the Cross City Tunnel or the Cross City Tunnel ventilation stack. Refer to ENS-SK-6100(01).	C
	f)	• Provides detailed information on the design, capacity and operation of the realigned Wheat Road, including coach/taxi/private vehicle set down/pick up, off street car parking, public disability parking and loading and servicing as part of the Stage 1 development application for TfNSW's information and consideration and should ensure that the proposal can adequately accommodate all vehicles associated with the operation of the proposed development;		This will be included in the re-submission. Concept designs for the Wheat Rd/ Harbour Rd solution have evolved. This has been done with a better understanding of requirements to improve access/ Egress from the Ribbon project, planning for the RMS Smart Motorways projects, requirements of RMS/ TfNSW Metro to improve bus and Taxi parking bays. The revised concept and intersection planning was presented to RMS and TfNSW Metro on the 29th August 2017.	C

	g)	•Undertakes swept path analysis for all vehicles associated with the operation of the proposed development for the realigned Wheat Road (including set down/pick up stands and off street car park and loading dock ingresses/egresses) and at all access points to Wheat Road and Harbour Street;		This will be included in the re-submission. Concept designs for the Wheat Rd/ Harbour Rd solution have evolved. This has been done with a better understanding of requirements to improve access/ Egress from the Ribbon project, planning for the RMS Smart Motorways projects, requirements of RMS/ TfNSW Metro to improve bus and Taxi parking bays. The revised concept and intersection planning was presented to RMS and TfNSW Metro on the 29th August 2017.	C
	h)	• Assesses available area for queuing of vehicles on the Wheat Road approach of the Wheat Road/Harbour Street intersection. The assessment should ensure that no through traffic travelling north of the development site is impacted by vehicles associated with the operation of the development (coaches, taxis, private vehicles and loading and servicing vehicles), including any queuing around the proposed turning circle;		This will be included in the re-submission. Concept designs for the Wheat Rd/ Harbour Rd solution have evolved. This has been done with a better understanding of requirements to improve access/ Egress from the Ribbon project, planning for the RMS Smart Motorways projects, requirements of RMS/ TfNSW Metro to improve bus and Taxi parking bays. The revised concept and intersection planning was presented to RMS and TfNSW Metro on the 29th August 2017.	C
	I)	• Maintains the existing Harbour Street left-turn deceleration lane into Wheat Road; and		This will be included in the re-submission. Concept designs for the Wheat Rd/ Harbour Rd solution have evolved. This has been done with a better understanding of requirements to improve access/ Egress from the Ribbon project, planning for the RMS Smart Motorways projects, requirements of RMS/ TfNSW Metro to improve bus and Taxi parking bays. The revised concept and intersection planning was presented to RMS and TfNSW Metro on the 29th August 2017.	C
	J)	• Consults with Roads and Maritime Services and CBD Coordination Office.		This will be included in the re-submission. Concept designs for the Wheat Rd/ Harbour Rd solution have evolved. This has been done with a better understanding of requirements to improve access/ Egress from the Ribbon project, planning for the RMS Smart Motorways projects, requirements of RMS/ TfNSW Metro to improve bus and Taxi parking bays. The revised concept and intersection planning was presented to RMS and TfNSW Metro on the 29th August 2017.	C
6		**Pedestrian Connections**			
	K)	The Pedestrian Assessment undertaken for the proposed development analysed the existing site and the proposal's impact on site accessibility and movement, in particular, four primary pedestrian routes that connect Cockle Bay Wharf to the surrounding area, including: • Route 1: CBD to Pyrmont Bridge; • Route 2: CBD to Cockle Bay Wharf (north bridge); • Route 3: CBD to Cockle Bay Wharf (central bridge); and • Route 4: Druitt Street Bridge. The Pedestrian Assessment identified potential enhancements to the pedestrian routes which could form part of the proposed development, including to Routes 1, 2 and 4. The proposal does not clearly identify that these enhancements will form part of the proposed development, albeit it identifies the following objectives of the development: • The refresh of the pedestrian access from the CBD to Darling Harbour via Druitt Street; and • The reconnection of the city with the Darling Harbour waterfront and the Darling Park Crescent Garden.		The revised concept design will address in detail the strategies that the redevelopment will implement to enhance pedestrian access through and around the redevelopment site. CBW redevelopment team have suggested that a 'whole of Government' solution may be appropriate to address the 'upstream' pedestrian corridors down Druitt St and Market street to the development footprint. The allocation of cost will need to be further discussed and agreed between all parties.	C

	L)	A review of the Pedestrian Assessment undertaken for the proposed development indicates that there may be opportunity for improving the Route 4 (Druitt Street Bridge) entry access point from the Darling Harbour waterfront and increasing its capacity to accommodate Darling Harbour workers and visitors (including during events) for the Darling Harbour precinct. TfNSW advises that the enhancement of Route 4 provides an opportunity to improve access to the Darling Harbour precinct by providing it with a quick and direct link to the heavy rail network at Town Hall Station, the planned Sydney Metro at Pitt Street Station, the Sydney Light Rail on George Street and bus services on Druitt Street, not offered under any other pedestrian route between Darling Harbour and the CBD. Further, the Traffic Report states that the proposed development will improve cyclist access by reconnecting the CBD with Darling Harbour via Darling Park. TfNSW advises that the location of the development site provides it with a unique opportunity to improve cycleway connections between Pyrmont/Bays Precinct and the CBD by connecting the existing pedestrian/cycle infrastructure on the Western Distributor (which currently ends at the southern part of the development site) with the King Street and Kent/Liverpool Street cycleways via the development site. TfNSW Recommendation TfNSW requests that the applicant:		The revised concept design will address in detail the strategies that the redevelopment will implement to enhance pedestrian and bicycle access through and around the redevelopment site. CBW redevelopment team have suggested that a 'whole of Government' solution may be appropriate to address the 'upstream' pedestrian and bicycle corridors down Druitt St and Market street (pedestrian) and via the Western Distributor corridor (TfNSW preferred bike route) to and through the development footprint. Cyclist route around the Western Distributor has been incorporated in the revised Stage 1 SSDA amended concept proposal, as requested by TfNSW The allocation of cost will need to be further discussed and agreed between all parties.	C
	M)	• Confirm if the identified potential enhancements to pedestrian Routes 1, 2 and 4 form part of the proposed development and provide more detail on each route's enhancement;		The revised concept design will address in detail the strategies that the redevelopment will implement to enhance pedestrian and bicycle access through and around the redevelopment site. CBW redevelopment team have suggested that a 'whole of Government' solution may be appropriate to address the 'upstream' pedestrian corridors down Druitt St and Market street to the development footprint. The allocation of cost will need to be further discussed and agreed between all parties.	C
	N)	• Consider improving the entry access point to Route 4 (Druitt Street Bridge) from the Darling Harbour waterfront and increasing its capacity to accommodate Darling Harbour workers and visitors (including during events) to provide a quick and direct link to the CBD and public transport network, as part of the proposed development in consultation with the CBD Coordination Office; and		The revised concept design will address in detail the strategies that the redevelopment will implement to enhance pedestrian and bicycle access through and around the redevelopment site. CBW redevelopment team have suggested that a 'whole of Government' solution may be appropriate to address the 'upstream' pedestrian corridors down Druitt St and Market street to the development footprint. The allocation of cost will need to be further discussed and agreed between all parties.	C
	O)	• Considers improving the cycleway connections between Pyrmont/Bays Precinct and the CBD by connecting the existing pedestrian/cycle infrastructure on the Western Distributor with the King Street and Kent/Liverpool Street cycleways via the development site, in consultation with the CBD Coordination Office.		The revised concept design will address in detail the strategies that the redevelopment will implement to enhance pedestrian and bicycle access through and around the redevelopment site. Further discussion required with the CBD Coordination Office. Cyclist route around the Western Distributor has been incorporated in the revised Stage 1 SSDA amended concept proposal, as requested by TfNSW	C

7		**Construction Pedestrian and Traffic Management Plan**			
	P)	The Principles of Construction Traffic Management Report and Preliminary Construction Management Plan prepared for the proposed development identify that the construction process for the overall development will involve the development of a series of construction traffic management plans due to the development's multiple stages of construction. The documents identify various principles which are considered to have an impact to the CBD traffic network and pedestrian and cycle networks and are not supported by TfNSW. These include: • The demolition or partial closure of pedestrian bridges between Darling Harbour and the CBD, especially during events at Darling Harbour; • The partial closure of the Western Distributor, Harbour Street and Wheat Road; • The accommodation of trucks within designated work zones/temporary construction compounds adjacent to construction activity; • The installation of a temporary set of traffic signals at the intersection of Harbour Street/Blackwattle Place; • The use of George Street for truck approach routes during and after the Sydney Light Rail construction; and • The use of York, Erskine and Sussex Streets for truck approach routes during bus operation.		To be addressed in the revised and updated Multiplex Construction Traffic Management Plan. Appropriate temporary pedestrian access (walkways and bridges) will be provided around the redevelopment works.	C
	Q)	It is noted that the proposal seeks concept approval for the construction of new buildings which would be proposed under a Stage 2 development application, however proposes the demolition of existing site structures as part of the subject development application. TfNSW advises that several construction projects, including the Sydney Light Rail Project, Sydney Metro City and Southwest Project and the adjoining IMAX Theatre redevelopment are likely to occur at the same time as this development within the CBD. The cumulative increase in construction vehicle movements from these projects could have the potential to impact on general traffic and bus operations within the CBD, as well as the safety of pedestrians and cyclists particularly during commuter peak periods. **TfNSW Recommendation** TfNSW requests that the applicant be conditioned to the following:		Agreed. The detailed CPTMP will be prepared by the successful contractor and submitted for approval prior to the issue of any Construction Certificate.	

	R)	• Prepare a Construction Pedestrian and Traffic Management Plan (CPTMP) in consultation with the CBD Coordination Office within TfNSW. The CPTMP needs to specify, but not be limited to, the following: o Location of the proposed work zone; o Location of the crane; o Haulage routes; o Construction vehicle access arrangements; o Details of temporary pedestrian access arrangements. The proposed temporary pedestrian access arrangements should be provided prior to the demolition of pedestrian bridges. The proposed temporary pedestrian accesses should be able to cater for the current demand of the pedestrian bridges that are to be demolished; o Proposed construction hours; o Estimated number of construction vehicle movements; o Construction program; o Consultation strategy for liaison with surrounding stakeholders; o Any potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction of the proposed works; o Cumulative construction impacts of projects including Sydney Light Rail Project, Sydney Metro City and Southwest Project and IMAX Redevelopment Project. Existing CPTMPs for developments within or around the development site should be referenced in the CPTMP to ensure that coordination of work activities are managed to minimise impacts on the road network; and o Should any impacts be identified, the duration of the impacts and measures proposed to mitigate any associated general traffic, public transport, pedestrian and cyclist impacts should be clearly identified and included in the CPTMP.		Agreed. The detailed CPTMP will be prepared by the successful contractor and submitted for approval prior to the issue of any Construction Certificate.	
	S)	Submit a copy of the final plan to the Coordinator General, CBD Coordination Office for endorsement, prior to the issue of any construction certificate.		It is currently forecast that the redevelopment construction will not commence until after completion of the Ribbon Project at end-2019.	
		End of Letter			

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