MULTIPLEX

PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

Cockle Bay Park Project
DPT Operator Pty Ltd and DPPT Operator Pty Ltd
15 September 2017

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Executive Summary

Multiplex has been working with DPT Operator Pty Ltd (“DPT”) on the Cockle Bay Park Project (CBPP) since early 2015.

During this time we have provided phasing/programme advice and solutions, a Construction Management Plan (CMP) and buildability input and lessons learnt from our experience on the adjacent 161 Sussex Street Redevelopment. In this submission we have reviewed the latest architectural and structural documents providing the following:

» An updated CMP including drawings and sketches

» An updated Indicative Construction Programme

» A draft Risk and Opportunities Register

» An overview of our proposed next steps.

During the course of our review, we have meet with the consultant team on two occasions to present our progressive advice and input whilst imparting our lessons learnt to enable DPT’s consultant team to provide accurate design, cost and programme feedback to DPT. Our updated programme and methodology have been revised to reflect the latest design, traffic requirements and lessons learnt from the 161 Sussex Street Redevelopment.

We have included in this submission ‘Next Steps’ for the project, which are a set of recommendations that we believe will enable DPT to develop the project through the next phases in the most time and cost effective manner. The highlights of this section are detailed below:

» Cost – Risk & Opportunity considerations, Value Engineering and Design Enhancement treatment

» Design – Investigations, Structural Option

» Programme – Market testing & sounding

» Methodology – Materials Handling

» Commercial – Value add.

We thank you for the opportunity to provide input into this exciting, precinct changing project. We remain committed to assisting DPT in the next phases of the project and look forward to working together with DPT to take this project into the next phase.

1. Introduction

This preliminary Construction Management Plan (CMP) has been prepared by Multiplex Constructions Pty Ltd on behalf of DPT Operator Pty Ltd and DPPT Operator Pty Ltd (the Proponent). This CMP supports a State Significant Development Application (SSDA) submitted to the Minister for Planning and Infrastructure pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and in response to submissions received from Authorities and the public at large.

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 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.

The final version of this Plan will ensure all construction is properly facilitated, integrated and coordinated thus guaranteeing the Project's objectives are met. It is intended that further detailed CMP's and works plans, for each phase of the project, as outlined in this plan, will be prepared and relevant approvals secured prior to construction commencement.

1.1 Background

The Proponent controls the lease of the Site, and also of the adjacent Darling Park precinct. The Darling Park site is a successful premium grade office precinct located on the west of the Sydney CBD, the associated Crescent Garden, located to the west of the three existing Darling Park towers, is a key area of open space in this part of the city.

The Proponent has recognised a number key issues with the existing layout of the Darling Park and Cockle Bay precinct, these being:

» The existing Cockle Bay Wharf building is not well integrated with the city, the Western Distributor freeway currently acts as a barrier to separate this area from the CBD;

» Publicly accessible open space is limited to the existing Crescent Garden in Darling Park; and

» The existing Cockle Bay Wharf building is outdated and is not in keeping with the future of Darling Harbour area as a vibrant entertainment and tourist destination.

The Cockle Bay precinct is at risk of being left behind and undermining the significant investment being made in Darling Harbour that will see it return to the world stage as a destination for events and entertainment. Accordingly, the Proponent is taking a carefully considered and staged approach to the complete revitalisation of the site and its surrounds. The envisaged development, which will be facilitated by the proposed building envelopes will:

» Reconnect the city with the Darling Harbour waterfront;

» Create new publicly accessible open space in the heart of the Sydney CBD;

» Create new public land above the Western Distributor;

» Provide new access routes between the city and the ICC Sydney / Darling Harbour Live precinct;

» Support the Sydney economy by providing a new premium commercial building; and

» Refresh and renew an existing entertainment and tourist destination.

1.2 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.

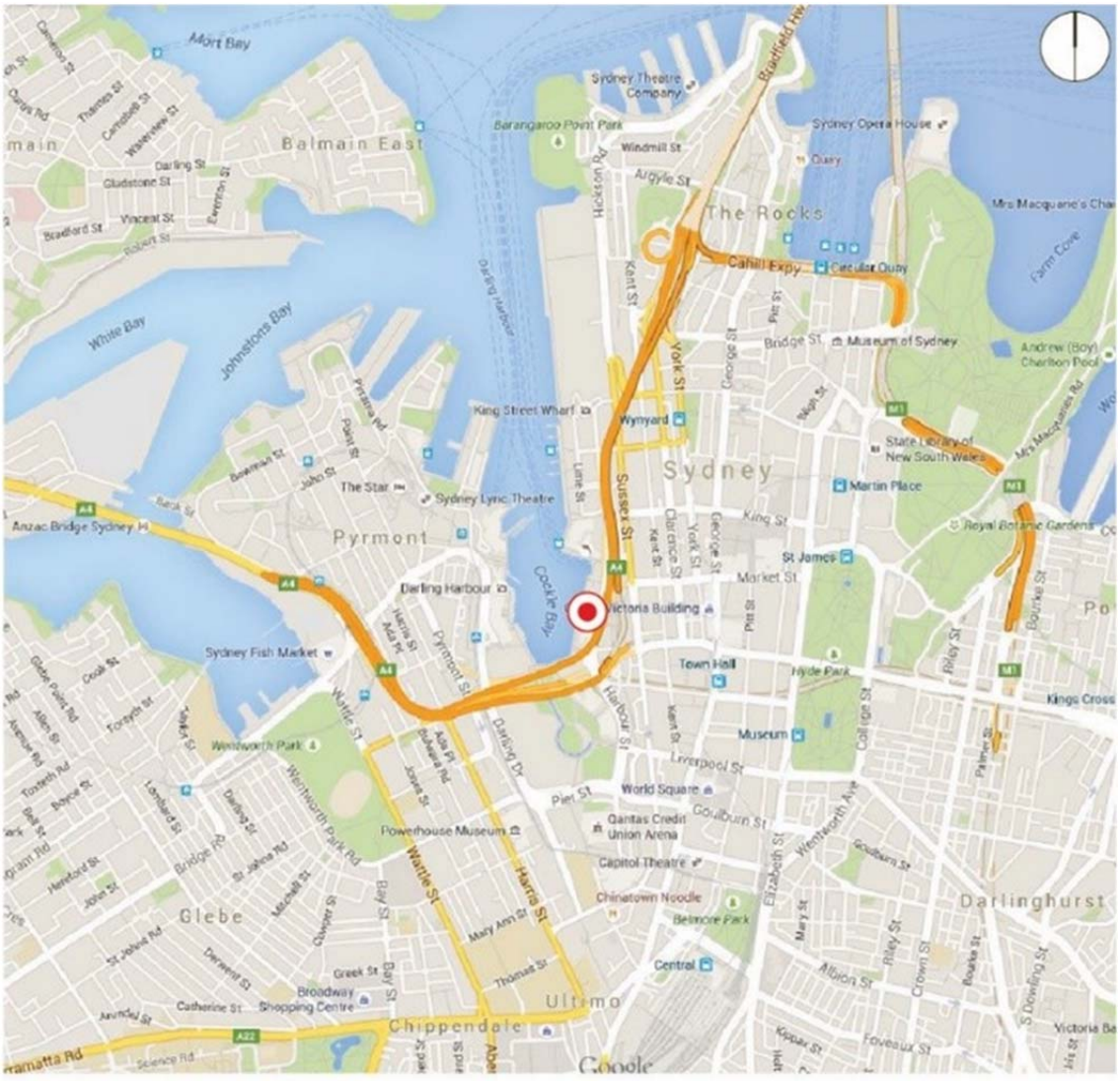


Figure 1 *Location Context Area Plan*

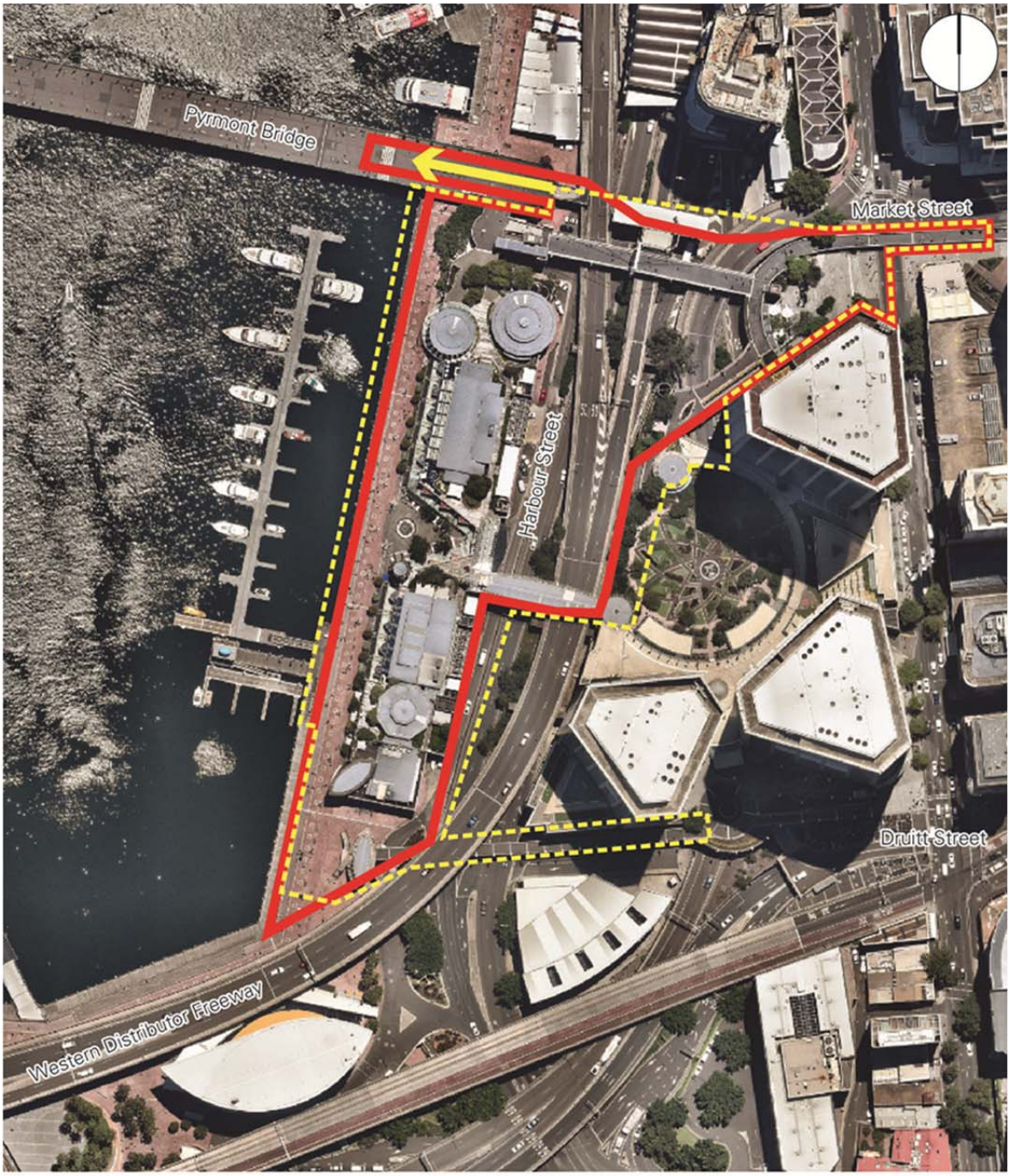


Figure 2 *Location Plan (revised Site area in yellow)*

Figure 3 *Amended Location Plan*

1.3 Overview of Amended Concept Proposal

The proposal relates to a staged SSDA and seeks to establish amended concept proposal details for the renewal and re-imagining of the Cockle Bay precinct. The amended Concept Proposal establishes the vision, planning and development framework which will be the basis for the consent authority to assess future detailed development proposals. The Cockle Bay Park Site is to be developed for a mix of Retail, Cultural and Commercial (Office) uses including retail and restaurants, offices, and publicly accessible open space.

The amended Concept Proposal seeks approval for the following key components and development parameters:

» Demolition of existing site improvements, including the existing Cockle Bay Wharf building complex, pedestrian bridge links across the Western Distributor, and obsolete monorail infrastructure;

» Building envelopes;

» Land uses across the Site;

» A maximum total Gross Floor Area (GFA) across the Cockle Bay Park of 75,000m2 for commercial development and 14,000m2 for retail (including food and beverage) development;

» Urban Design and Public Realm design principles to provide a Design Excellence framework; and

» Strategies for utilities and services provision, drainage and flooding, and ecological sustainable development.

2. Works Description

2.1 Project Phasing

The Project will require authority approvals, design, construction planning and commercial issues to be resolved before construction can commence. Given the nature of the Land bridge construction crossing the Western Distributor, and Multiplex's recent experience with 161 Sussex Street, a rigorous approval process will need to be coordinated with TfNSW, RMS, PNSW and City of Sydney Council for each road closure required for construction activity on or above the roads. The date of Project commencement of construction is subject to leasing commitments and market demand, further to a Stage 1 & 2 DA approvals process.

The Project is proposed to be constructed in four separate phases. The phases listed below are in approximate order of construction but may overlap in duration, or may be re-ordered as required by the owners. The project phasing including major activities associated with the construction are identified in the table below and shown diagrammatically on Figure 4 overleaf**.** A programme of major work items is included in Appendix 1.

Phase 1	Survey and Site Establishment » Detailed site survey » Extensive potholing » Erection of site hoarding and accommodation » Establishment of environmental and safety controls prior to demolition » Left turn onto Wheat Road established behind Helm Bar » Civil works to the south intersection of Wheat Road and Harbour Street to establish construction access
Phase 2	Demolition » Demolition of existing Cockle Bay Wharf structure » Alternate pedestrian links established including temporary access from Sussex St to Pyrmont Bridge » Demolition of pedestrian bridges » Demolition of Darling Harbour Monorail Station
Phase 3	Land bridge (Level 3 Podium) » Establish tower cranes » All works on or above the Western Distributor restricted to 9pm and 5am Sunday to Friday » Piling, pile caps, columns, headstocks, beams and topping slab » Ramps, paths and terracing » Services » Public Domain, landscaping and finishes
Phase 4	CBP Tower and New CBP Retail Podium » Excavation of lift core pit » Tower and core piles » New podium piles through existing promenade deck with harbour protection measures » Works to the existing ground floor structure » Superstructure and façade » Vertical transport and services » Public Domain, landscaping and finishes » Wayfinding and Signage

2.2 Site Management – Organisations and Responsibilities

The Proponent intends to appoint a managing Design and Construct Contractor (to be known as 'Contractor' within this document) for the design finalisation, construction approvals, delivery, completion and certification of the CBP Project .

An indicative organisational and responsibilities chart is shown below:

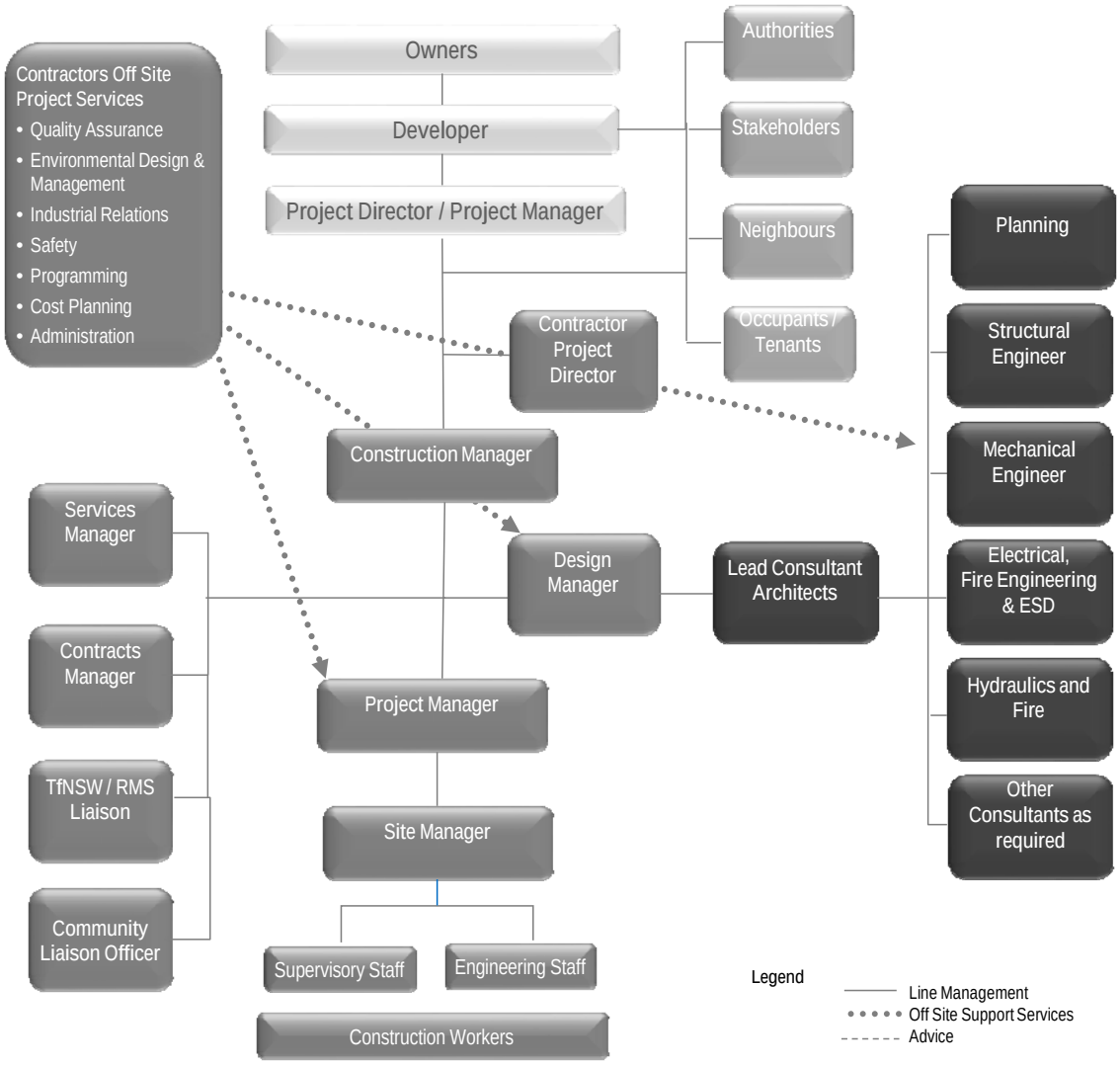


Figure 4 *Organisational Chart*

3. Physical Constraints of the Site

An understanding has been developed of the physical constraints that impact the Site. A summary of these constraints follows.

3.1 Darling Park

Darling Park will remain an operational precinct throughout the proposed development. Currently housing three premium office towers, a centrepiece crescent garden and a variety of retail and dining options, it is crucial that the day-to-day operations and amenity of Darling Park are not disrupted.

3.1.1 Safety

The area of Darling Park directly affected by the project is the Western boundary, where the interface of the new Land bridge will occur. There will be a 5-6m height difference between the top of the Land bridge terrace and the crescent garden, and therefore overhead protection measures will be in place to protect pedestrians below. A formwork screen will extend from the slab edge and a B-Class hoarding with 10kPa overhead protection will be established within the crescent garden, with a temporary footpath underneath. The landscaping to the crescent garden will be restored upon project completion.

A formwork screen will also be established for all other live edges with a potential to impact traffic or pedestrians. This includes the area adjacent to Market Street at the interface of the Land bridge deck and the ground floor DP1 podium. These protection measures can be seen on Figure 4 below.

3.1.2 Cranes and Materials Handling

A preliminary crane analysis has been carried out considering the size and position of the precast concrete elements making up the Land bridge (over the Western Distributor). Three luffing cranes will be required with two to be positioned on the Cockle Bay Wharf side and one on the Sussex St side. These cranes will lift the larger precast components lifted from the road network during approved road closures. A 10kPa protection deck or hoarding will be installed prior to lifting any materials or luffing over any areas outside of the site boundaries. Although having the potential to extend over Darling Park, a strict Crane Management Plan will be in place to forbid slewing over Darling Park, and the cranes will simply luff upwards to avoid DP1 and DP3. See section 5.3 for more detail regarding cranes and materials handling.

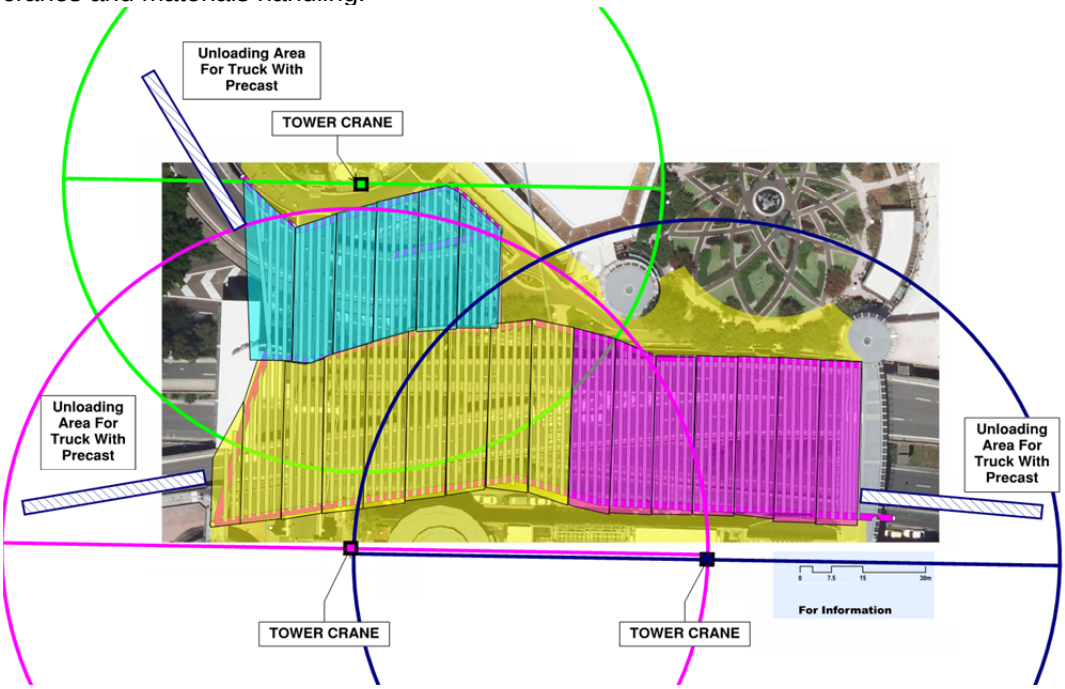


Figure 5 *Materials Handling Plan at Level 3*

3.2 Roads

The Western Distributor, Harbour Street and Wheat Road run through the centre of the development site and present a significant physical constraint for the construction of the Land bridge. The interaction of the development with the surrounding roads is being discussed with the relevant authorities and will require a Works Authorisation Deed (WAD) between the Proponent and the RMS. Upon approval of the WAD, each individual road closure will require a Road Occupancy Licence (ROL) which can be applied for one month prior to the closure. For more detail regarding traffic management and road closures please refer to the 'Principles of Construction Traffic Management' report produced by Colston Budd Rogers & Kafes Pty Ltd.

3.2.1 The Western Distributor

The Western Distributor is a state road managed by RMS and is an elevated overpass in this area. Components of the Western Distributor directly affected by the development include:

» The northbound portion between the Pyrmont Street/Fig Street/Anzac Bridge on-ramps and the Harbour Bridge

» The southbound portion from the Harbour Bridge

» The southbound on-ramp extending from Market Street and travelling underneath Darling Park

» The northbound off-ramp leading to King Street

A combination of these lanes may require closures at any one time. The extent of the Western Distributor in the vicinity of the development is highlighted in orange on Figure 5 below.

3.2.2 Harbour Street

Harbour Street is largely an on-grade road in this area, merging with the Western Distributor north of the site. The majority of expected road closures will be on Harbour Street as the foundations for the Land bridge Terrace Underpass are situated within the Harbour Street medians. Closures at the Bathurst Street intersection northbound and Harbour Bridge southbound will need to be approved and coordinated. The extent of Harbour Street in the vicinity of the development is highlighted in blue on Figure 5 below.

3.2.3 Wheat Road

Wheat Road is a one-way road servicing loading dock areas for Cockle Bay Wharf and other buildings along Darling Harbour.

Between Druitt St and The Pyrmont Bridge Wheat Road acts as a service road for Cockle Bay hence once the demolition of Cockle Bay commences this section of Wheat Road will not be required. A temporary left turn off Harbour Street onto Wheat Road is proposed to the north of the Pyrmont Bridge, maintaining access to back of house areas servicing Helm Bar, the aquarium, zoo and wax museum (Refer to Section 5.1). It is anticipated that the Ribbon/IMAX site will be in operation during the construction of the Project, and as such a combined Construction Traffic Management Plan may be developed between the two Contractors if required.

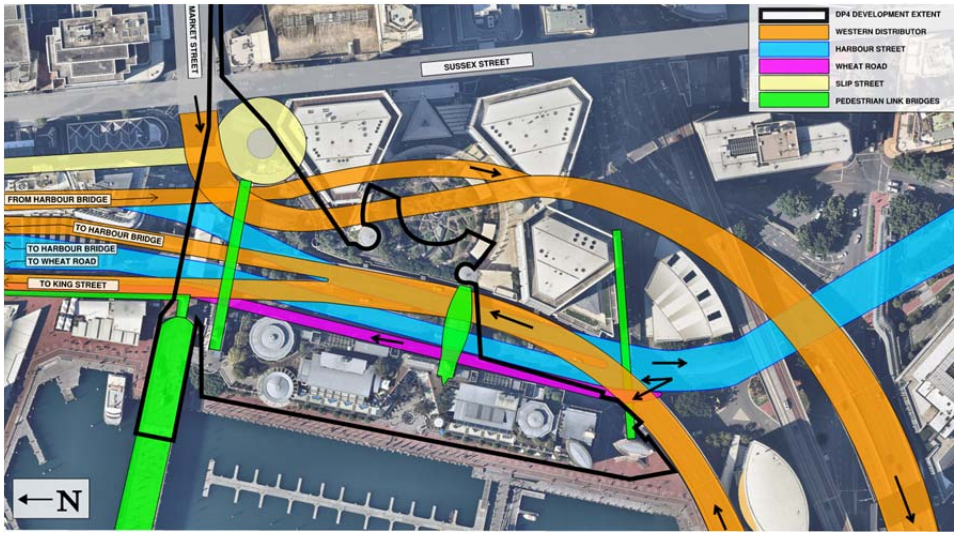


Figure 6 *Roads and pedestrian links in the vicinity of the development envelope*

3.2.4 Working Hours

Construction activities over Harbour Street or the Western Distributor including foundation and service relocations will take place as night works due to the road closures necessary to construct the Land bridge structure. From previous experience at 161 Sussex Street (pictured below), Multiplex has anticipated full road closures between 9pm and 5am Sunday to Friday nights. These works will be coordinated with the CBD Coordination office for traffic logistics and major events. Whilst services works, landscaping, finishes to the deck, and stairs down to the Crescent Garden may occur during the day, the construction of the underpass foundations and structure will take place out of hours with coordinated road closures with appropriate detours.

Figure 7 *Four Points by Sheraton at 161 Sussex Street Sydney*

3.3 Pedestrian Bridges

There are three pedestrian bridges in the vicinity of Cockle Bay Wharf that cross the Western Distributor, Harbour Street and Wheat Road. See Figure 5.

3.3.1 Cable-stayed Pyrmont Bridge Link to Sussex Street and Existing Monorail Infrastructure

This is a cable-stayed bridge linking the Pyrmont Bridge with Sussex St. This bridge overlaps with the current design for the Land bridge and will therefore need to be demolished in a staged manner to continue pedestrian access. Works to demolish this bridge will occur as night works coordinated with relevant authorities. An option for maintaining access may involve construction of a portion of the new deck prior to demolition of the existing bridge, or a temporary modular pedestrian bridge to the north of the development. The monorail station adjacent to the pedestrian walkway will be demolished in conjunction with the cable stayed bridge. Where possible there may be opportunity to re-use the existing footings for the monorail station and the existing pedestrian bridge.

Figure 8 *Cable-stayed bridge linking Pyrmont Bridge with Sussex Street and Existing Monorail Station. Aerial view. (Google Maps, 2017)*

3.3.2 Cockle Bay Wharf – Darling Park Bridge

This bridge was constructed to link Cockle Bay Wharf with Darling Park across the road. The bridge structure and Western abutment will be demolished along with Cockle Bay Wharf as part of the development, whilst the rotunda at the Eastern abutment will be retained and tied into the new Land bridge. Works to demolish this bridge will occur as night works coordinated with relevant authorities.

Figure 9 *Cockle Bay Wharf to Darling Park Bridge. Aerial view looking North (Google Maps, 2009)*

3.3.3 Cockle Bay - Druitt Street Link

This steel bridge crosses Wheat Road and Harbour Street and provides a pedestrian link between Darling Harbour (just south of Cockle Bay Wharf) and Druitt Street. This bridge will be incorporated into the new podium design and access will be maintained. Staging and safety provisions for this link bridge will be incorporated into the construction planning for the final design. It is proposed that the Cockle Bay Druitt St link will be enhanced to improve the pedestrian experience. This enhancement will also include the demolition of the existing “Spanish Stairs”.

Figure 10 *Darling Harbour to Druitt Street link bridge looking North from Harbour Street. (Google Maps, 2015)*

4. Major Work Items

4.1 Demolition

Demolition on the Site will be completed in a manner appropriate for its central, high traffic location. Noise, dust and vibration levels will be controlled in accordance with good practice for CBD construction and City of Sydney guidelines to minimise impacts to adjacent tenants as well as the general public and amenity of Darling Harbour.

A project specific Demolition Plan will be developed following further design progression. Demolition will be carried out primarily during Phase 2 with the demolition of the existing Cockle Bay Wharf podium, the two link bridges and the decommissioned monorail station as outlined in Section 3.3. Detailed demolition at connections with Darling Park will also need to take place to construct the Land bridge Terrace as part of Phase 3 works. Localised demolition of kerbs and gutters will be required to make way for piling rigs around median strips on Harbour Street. The bulk of demolition work will occur within the Cockle Bay Wharf site, with limited demolition over the roads taking place during road closures. A dilapidation report will be conducted and all kerbs will be reinstated compliant with RMS standards.

Detailed work methods are yet to be determined, however it is envisaged that the Contractor will utilise small excavators and bulldozers to demolish upper floor slabs, and pneumatic hammers on excavators for lower levels. Structural certifications need to be obtained for working machinery on the existing concrete slabs to be demolished.

During both demolition and excavation, the Contractor will pay specific attention to items of heritage significance to ensure no damage occurs i.e working in the vicinity of the Pyrmont Bridge when demolishing the northern extent of Cockle Bay Wharf. The Demolition Plan will also address procedures for catching debris, filtering run-off and minimising dust during demolition works.

To facilitate the work, construction hoardings will be erected on all frontages. Due to the proximity of the existing building to the Darling Harbour promenade to the West, and Harbour Street to the East, an external scaffold with chain wire mesh and shade cloth will be erected on all exposed work faces to act as fall protection, supress dust, prevent falling objects and provide visual amenity to the surrounding area. To enable the demolition to be completed safely in isolation to the adjacent roads including Harbour St and the Western Distributor safety screen will be erected on the existing Eastern boundary of Wheat Road.

A hazardous materials survey will be undertaken to identify the location and type of hazardous materials on the site as well as a dilapidation survey of any adjacent infrastructure or buildings. As Darling Park was constructed in the early-mid 1990's, with Cockle Bay Wharf following from 1998-99, the extent of hazardous material in the structure is expected to be minimal.

4.1.1 Typical Demolition Sequence

» Erect class 'A' and 'B' hoardings to separate adjoining areas from the proposed demolition zone
» Undertake services terminations and relocations
» Install any necessary retention, stabilisation and protective measures
» Hazmat removal and soft strip out
» Commencing from top down with demolition of façade and structural elements
» Metal, rubbish, concrete and masonry will be progressively loaded onto trucks for transport off site to the recycling depot.

Factors that will need to be further considered in the future development of the demolition plan include:

» Minimisation of noise and dust
» Effective loading out of materials in order to achieve maximum productivity
» Identification and removal of hazardous materials prior to demolition commencement
» Traffic management plan
» Identify local areas which may be affected by the demolition and construction activities i.e close proximity to the Sea Life Aquarium, the existing Darling Park towers and other neighbouring buildings.

The demolition methodology will be planned to deliver the maximum productivity for a CBD site such as this in order to minimise disruptions over an extended period. It is intended that the demolition contractor can utilise Wheat Road for construction access to maximise efficiency.

4.1.2 Demolition Staging

Please refer to construction sketches in Appendices when reading this section.

PART 1	» Perimeter hoardings and site accommodation established » A left turn lane from Harbour Street onto Wheat Road will be established to the north of the site and modifications to Wheat Road at the South .This is subject to approval from RMS. » Wheat Road access behind CBW will be restricted to construction traffic which must be coordinated and captured in the TMP. » The Darling Park pedestrian bridge will be demolished » Demolition of the southern half of CBW will commence. » Erection of Temporary Access bridge for pedestrians
PART 2	» The cable-stayed pedestrian bridge will be closed to the public and demolition will commence. Alternate access will be established prior to closing the bridge. » The existing Monorail station will be demolished » Demolition of the northern half of CBW will commence
PART 3	» Existing CBW podium demolition complete » Temporary ring road at the Southern end of the site will be established to allow the previous Wheat Road to be close to construction vehicles. With construction vehicles now entering and exiting the site from the South. » Foundation works to the Cockle Bar Park tower core and piles
PART 4	» A new temporary access road through the site willl be completed and used for construction access. With vehicles entering the site from the South and exiting to the North. » Foundation works to the Cockle Bar Park tower core and podium piles will progress
PART 5	» Tower construction » Podium construction

4.1.3 Excavation and Foundations

4.1.3.1 Tower and Podium

Minimal bulk excavation and spoil removal is required for the Project. The proposed ground floor slab will be utilised as a working platform and local strengthened as required for heavy machinery. Bulk excavation to the tower core pit and detailed excavation of tower pile caps will be required. Piling for the proposed tower column piers will require a proven environmental management system with different strategies dependent on the pile position in relation to the existing sea wall. Piling through the existing ground level promenade deck will also be required to support the new podium structure. A cofferdam may be required due to the depth of the pile caps as well as the tower columns outside the existing seawall. This will comprise of a sheet piling wall driven to rock to allow dewatering and construction to take place. Tower and podium foundation construction methodologies will be confirmed following detailed design finalisation and included as part of the Stage 2 SSDA. The Environmental Management Plan will address piling in the vicinity of the harbour. Refer to Section 9 for approach to marine environmental controls.

4.1.3.2 Land bridge

Detailed excavation will be extensive in order to construct foundations in median strips on Harbour Street to support the Land bridge structure. This detail is dependent on the final foundation design and existing services.

Detailed work methods are yet to be determined, however it is envisaged that the contractor will use small excavators to dig pad footings and piling rigs to construct the column piers. The sizes of the piling rigs will be dependent on the head height clearance with the Western Distributor overpasses, as well as the width clearance within the different foundation zones.

Based on our previous experience on the 161 Sussex St Redevelopment, Multiplex worked with the structural engineer to reduce the number of foundations, to minimise the impacts on the Western Distributor. The extent of the road closure required was significantly reduced through this process.

4.2 Structure

New structure will be constructed as part of Phase 3 and Phase 4 works.

4.2.1 Phase 3

The Land bridge structure will feature concrete foundations which include deep bored piles and a pile cap. Concrete columns will extend from these foundations to support concrete headstocks, which may be precast elements. The primary deck girders will be precast concrete 'Super T' or similar beams craned into position, with a precast slab system utilised to form the deck slab and provide overhead protection to the roads above which these works will be carried out during approved road closures. This will allow reinforcement, edge formwork and services to be installed during the DA stipulated working hours and limit the required road closures.

4.2.2 Phase 4

The CBP Tower and podium structure is foreseen to consist of conventional reinforced concrete elements, post tensioned concrete elements and conventionally reinforced vertical concrete columns and cores. However the Eastern section of the tower will comprise of a structural steel frame that connects to the core and Bondek slabs. The steel elements consist of three heavily braced truss elements and detailed coordination will need to be completed during the final design of the tower to ensure these elements can be constructed with minimal impact on the typical floor cycles. . System formwork will be used for vertical elements such as lift and stair cores. The use of structural steel as a secondary structural frame for an internal tower atrium is also under consideration. As the design for the new structure is still under development, detailing and work methods are yet to be finalised. The typical floor structure will be erected behind perimeter formwork screens and will be progressed on a floor by floor basis split into two pours.

4.3 Fit-out and Building Services

Office floors within the CBP Tower will be built to meet modern premium grade office standards. The majority of new building services will be selected to ensure environmental performances meet the market leading targets (Greenstar/NABERS).

The new CBP podium will feature boutique retail, restaurant and bar fitout with plant rooms on the ground floor and Level 2 mezzanine.

4.4 External & Public Domain Works

A key component of the Project is the Cockle Bay Park Public Domain – Main Park which extends over the Western Distributor and connects Darling Park with Darling Harbour, offering a direct pedestrian link from Market Street. The Land bridge will act as an integrated public domain, and feature kiosks and cafes, amenities, landscaping and gardens. These landscaping and finishing works will ensure that the new development merges appropriately with the existing Darling Park podium on Sussex Street and the connecting bridge that extends along Market Street.

5. Site Layout, Logistics and Materials Handling

5.1 Construction Traffic Management

Colston Budd Rogers & Kafes Pty Ltd (CBRK) have prepared a report on the Principles of Construction Traffic Management for the Project, addressing the following:

» Wheat Road modification works

» Enabling & substructure works

» Hours of work

» Truck routes

» Traffic diversions

» Construction site entries

» Pedestrians

» Consultation

» Principles of construction traffic management

The CBRK report references temporary civil designs by Enstruct, included as Appendices 3 and 4.

5.1.1 Wheat Road Modification Works and Site Access

The section of Wheat Road adjacent to Cockle Bay Wharf will be closed for construction and a new entry to Wheat Road will be constructed at the Northern end of the site. To enable the permanent construction works a temporary turn off from Harbour St to Wheat Road will be established during night road closures. Public traffic will be diverted around the construction activity via Harbour Street and the temporary slip lane to Wheat Road to the north of the site. Construction vehicles access will be broken into two stages to minimise disruptions. During Stage 1 construction vehicles will enter and exit site at the Southern end of the site and during Stage 2 Vehicles will enter via the South and exit onto Wheat Road at the North of site. Details of the slip lane and site access can be seen in the figures below and further information regarding vehicular access can be found in the Colston Budd Rogers & Kafes Traffic management Plan. The new access lane will maintain access to existing bus/coach parking on Wheat Road, servicing Helm Bar and the adjacent Aquarium, and continued access to King Street Wharf via Shelley Street.

1. Construction of a new temporary connection to Wheat Road to the north of the site (refer to Figure below)
2. Modification to the entry to Wheat Road for Construction Vehicles at the Southern end of the site.
3. Closure of Wheat Road through CBP Site and diversion of existing Wheat Road traffic
4. Installation of temporary traffic signals at the intersection of Harbour Street and Blackwattle Place (left in and left out movements only). This will cater for construction traffic movements generated by the proposed Cockle Bay Park. (See Colston Budd Rogers & Kafes Traffic Management Plan)
5. Construction of the new Wheat Road entry and exits and adjustment of and temporary Wheat Road diversions as per the final design.

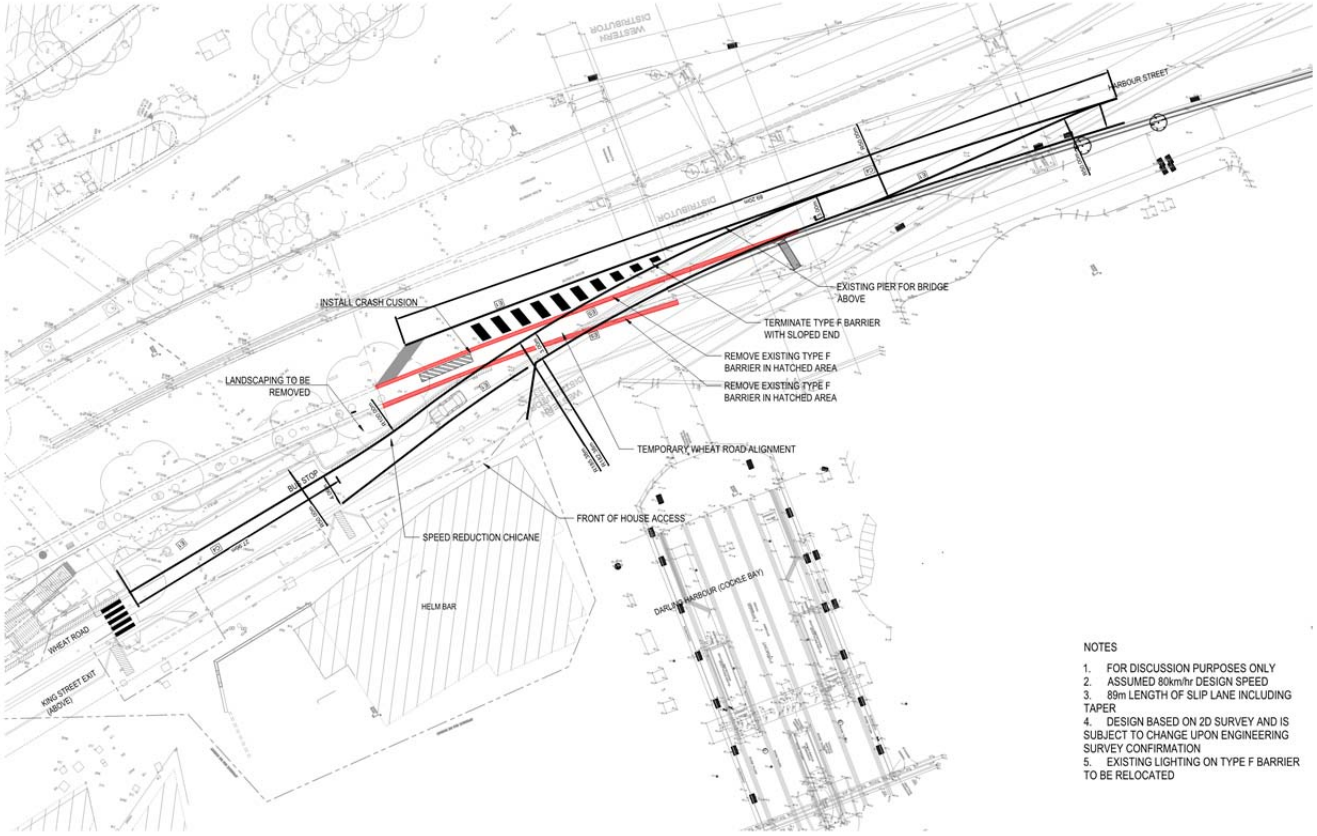


Figure 11 *Proposal for Left Turn off Harbour Street Behind Helm Bar*

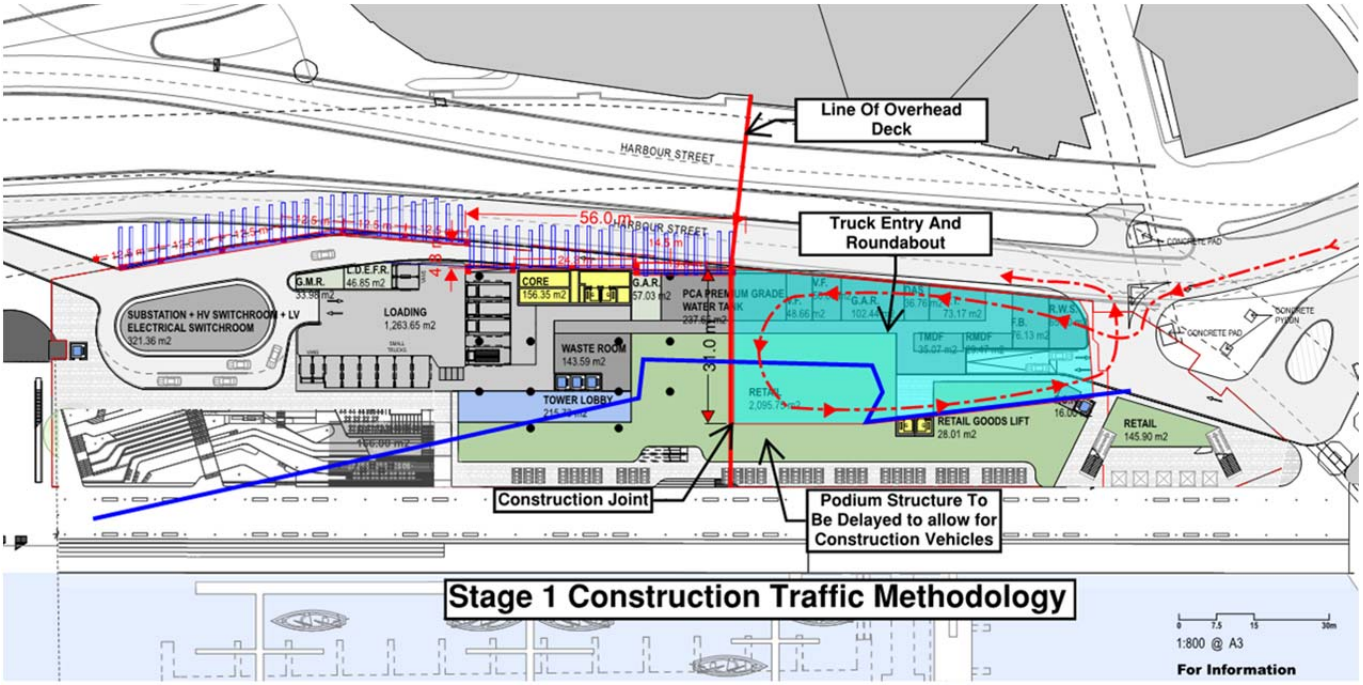


Figure 12 *Stage 1 Construction Traffic Methodology*

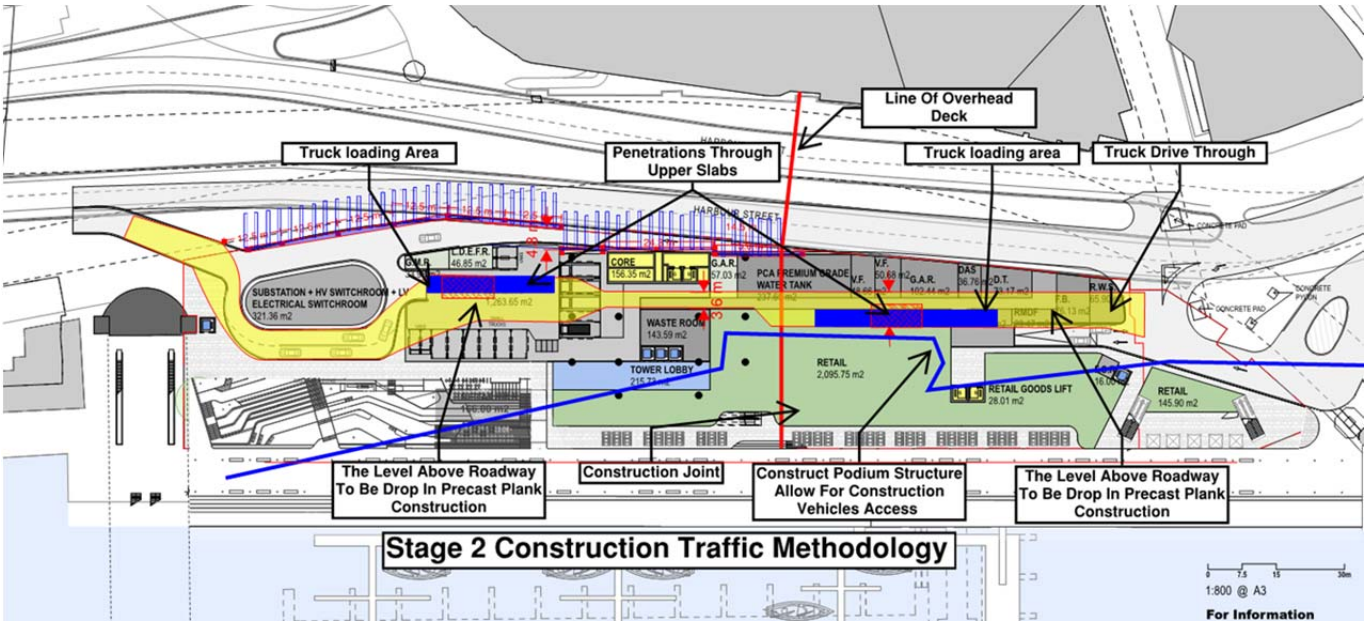


Figure 13 *Stage 2 Construction Traffic Methodology*

5.2 Material Deliveries

The site is bound by major arterial roads to the East and a significant pedestrian promenade to the West. This leaves Wheat Road as the only feasible construction access and materials delivery route for the Project.

The portion of Wheat Road behind CBW within the site boundaries is intended to be used during the demolition phase for construction vehicles only, and the remainder of Wheat Road to the North of the site will be maintained for buses, taxis and delivery trucks servicing Helm Bar and the aquarium complex to the north. This can be facilitated by establishing a left turn from Harbour Street onto Wheat Road as outlined in Section 5.1.1.

To ensure that there is sufficient public protection between the construction site and public roads, hoardings and barriers will be utilised. Vehicles entering and exiting the Wheat Road construction zone will do so in a controlled and planned manner with minimal disruption to local vehicular and pedestrian traffic. To sustain this focus the Contractor will manage construction, pedestrian and vehicular interactions on all public roads with traffic and pedestrian control. At all times the Contractor will be mindful of any work being undertaken by local authorities adjacent to and/or surrounding our site, and will cooperate with other contractors on adjacent developments to combine traffic control plans if necessary.

In order to minimise traffic on Harbour Street, a ‘Just in Time’ strategy will be utilised to ensure maximum efficiency whereby materials are only delivered to site when they are required. Excess materials are not stored on site to improve access paths, limit double handling and reduce further risks associated with excessive storage of material. This also provides a safe and efficient flow of construction vehicles in and out of the site onto Harbour Street and Wheat Road.

5.3 Hoardings and Overhead Protection

Hoardings will be installed to establish a secure barrier between the construction site and the general public.

External Hoardings

During the site establishment and mobilisation period, external hoardings will be erected on all external frontages. An “A” class hoarding, of standard plywood type construction, complying with the requirements of the City of Sydney Council hoarding policy, will be installed to along the northern, western and southern boundaries to establish a secure barrier between the construction site and Darling Harbour. The eastern frontage along Harbour

Street will be protected via a formwork screen on the jersey kerbs at the boundary. This screen will require WAD approval prior to installation.

A 'B' class hoarding of structural steel construction, complying with all requirements of the City of Sydney hoarding policy and the project specific requirements, will be installed in the vicinity of the new tower to facilitate the protection of the general public along the Darling Harbour Promenade. This hoarding will also provide a platform for site accommodation sheds. Hoardings and fences will comply with City of Sydney guidelines for branded films, way finding and marketing.

Scaffold and Screens

A combination of a perimeter screen system and scaffold will be utilised for the tower and podium structures respectively. The screens will provide perimeter protection coverage for approximately 4 levels and will progress upward with the tower structure. It is anticipated that the Land bridge Terrace structure over the Western Distributor is completed prior to the Level 4 Podium slab and tower progressing, in order to provide overhead protection and a propping base for the structure footprint extending over Harbour Street.

As the deck structure over the Western Distributor progresses, perimeter rails on all live edges will be installed to allow safe construction above the deck.

5.4 Cranes, Hoists and Loading Platforms

It is anticipated that a combination of tower cranes will provide an efficient configuration for the site, with mobile cranes introduced to supplement craneage as required. Crane type and number will take into consideration some of the following:

» Coverage and load capacity for lifting the precast concrete elements into position over Harbour Street and the Western Distributor

» Coverage for the podium structure

» Coverage for the tower structure

» Ability to slew to avoid surrounding structures

Figure 14 *Night works at the 161 Sussex Street development. Multiplex has experience craning precast beams into position over the Western Distributor.*

To provide adequate vertical transport for the tower construction we will require one twin hoist, one core hoist and a jump lift. Once the final lifts are operational three will be converted to builders lifts and the twin hoist will be removed.

5.4.1 Further Approvals

Upon consultation with Sydney Airport it has been noted that the Obstacle Limitation Surface (OLS) above the project site is RL156.000 AHD. An OLS Assessment will therefore need to be performed on Tower Crane 1 and Tower Crane 3, in addition to the proposed tower envelope itself, which extends to RL189.800.

Details of any cranes that are through the RL156.000 OLS will be forwarded to AirServices Australia, CASA and the Major Airlines for assessment and comment back to Sydney Airport. As Tower Crane operations will be greater than 3 months at a height through the Airports OLS surface, approval from the Federal Department of Infrastructure will be required.

5.4.2 Mobile Cranes

Due to the size of mobile cranes required, their mobilisation times and the minimal working hours during road closures, mobile cranes will only be used if absolutely necessary. Mobile cranes will be utilised for the erection and dismantling of the tower cranes and smaller mobile cranes may be used during night works if feasible. All crane loadings will be assessed in consideration of the road bearing capacities prior to mobilisation.

5.4.3 Hoists and Loading Platforms

A twin Alimak hoist will be used to service the tower structure. A jump lift within the tower core will also be used to provide access to the working jumpform deck.

Loading platforms will be utilised along the tower perimeter and along the podium perimeter to facilitate materials handling onto the working decks. These will be rotated upwards as the structure progresses.

5.5 Accommodation

In order to complete the construction works it is necessary to provide site amenities for the workers that include lunch, change, ablution, first aid and wash down facilities.

Options for housing project personnel include:

» On the ‘B’ class hoardings along the Darling Harbour Promenade

» Permission will be sought from the responsible authority to house site accommodation within a compound on Slip Street (for personnel working on the deck over the Western Distributor)

5.6 Site Induction

The Contractor will prepare and operate a specific site induction for all employees working on the project, and ensure that every individual on the project attends a site-specific induction before he or she is allowed to start work. This induction will be a requirement under the Occupational Health & Safety Plan to be formulated for the project. The site induction sessions will be held on a regular basis and where possible subcontractors will be requested to attend the week prior to the date they are due to start.

The site induction will include specific commentary on the Disruption Shutdown Application (DSA) and Permit to Work (PTW) processes. All employees will be educated on the behavioural and security and community requirements for the project. Any employee found to be repeatedly disregarding these requirements will be removed from site.

5.7 Site Security

A licensed security provider will be engaged to provide security services on the project. Preliminary details of the proposed site security methodology for the QQS project are detailed below:

» **Static Guarding** – A fully compliant and professional static security officer will be located at all entry and exit points during construction working hours.

» **Compliance Management** – The security contractor will provide a compliance operator to operate the electronic compliance system that will be commissioned onsite.

» **Access Control** – Security guards stationed at the entry points to the site provide access control to the site. Each individual entering the site will have their ID card scanned by the electronic compliance system. This system provides a record of every employee onsite and ensures that all subcontractors onsite have current and acceptable insurances, are bona-fide companies, and have all appropriate OH&S documentation in place.

» **Occupational Health & Safety** – The security guards at the entry gate control the entry of subcontractors and check that those entering site are wearing the appropriate PPE for working on a construction site.

Regular Patrols - The security guards will also complete regular patrols of the site and will contact the Site Manager should any issues of concern be identified.

6. Protection of Heritage Items and Surrounding Developments

Heavy construction works and general access will be directed away from areas of heritage significance as much as possible. Wherever required, heritage components will be protected with appropriate panelling, barriers and fencing. In general heritage items that are to remain and/or be refurbished will be identified and protected. Details of the refurbishment will be developed in conjunction with trade experts, the Heritage Architect and the agreed future Heritage Management Plan.

Site inductions and tool box talks will be held by the Contractor to inform site personnel and visitors of the location of heritage items and the requirements for their protection. Work method statements will be developed specifically for works in close proximity to heritage items.

There are areas on the site where demolition and excavation will occur adjacent to the heritage buildings that are to remain. These may require temporary protection measures to be implemented.

6.1 Dilapidation Survey

Prior to commencing work onsite, a full Pre-Construction Dilapidation Report will be completed by a Dilapidation Survey Consultant for adjacent structure to be retained (i.e the Pyrmont Bridge and RMS structures on Harbour Street/Western Distributor). The dilapidation report will cover all areas where construction works are occurring and to which the construction certificate applies. A post completion survey will also be compiled for comparison.

6.2 Adjoining and Adjacent Neighbours

Careful site management, which will minimise disruption and inconvenience to neighbouring buildings and their occupants, is of the highest importance. The Contractor will provide a Community Liaison Officer to work with neighbours, understand their needs and requirements, and, where possible, adjust construction works methodologies accordingly. The adjoining properties and neighbours specifically identified for consultation are identified below.

The surrounding properties include:

» Helm Bar and Bistro
» The Ribbon
» Ausgrid Offices
» 161 Sussex Street
» Darling Park Towers 1, 2 and 3
» Sydney Sea Life Aquarium
» Wild Life Sydney Zoo
» Madame Tussauds
» Charter and Commercial Vessels Operators

6.3 Surrounding Properties Management

6.3.1 Communication

Prior to commencement of works, the Contractor will undertake a communication meeting with the stakeholders and surrounding tenants. This briefing will involve an outline of the construction sequence, together with an overview of the staging and timing of the works. This initial meeting will provide an opportunity for input from the stakeholders and tenants before finalising methodology.

To ensure ease of communication between all parties, a protocol will be established to:

» Define lines of communication and appoint a single point of contact for neighbours
» Times for site inspections within the leased premises

» Specific dates for regular communication meetings
» Clarify the escalation process
» Implement the Disruption Shutdown Application (DSA).

It is essential that the stakeholder team is aware of current and future activities within the premises and how these could impact on tenants and customers. Points of contact between the Contractor's project team and stakeholders will be agreed for various scenarios, with stakeholders provided with 24 hour contact numbers. Key personnel from the Contractor's project team will be available to attend stakeholder internal briefings if required to communicate details of the proposed works to their respective team members.

6.3.2 Services Interruptions and Impairment

Prior to any services being impaired or work being carried out within an active operational environment, a Disruption Shutdown Application (DSA) will be made by the contractors. This process will be implemented on the project to provide advance agreement for specific work activities to be carried out. DSA's will typically be made a number of weeks in advance of proposed work and in line with the agreed project notification durations. Depending on the risk profile of the proposed work, the agreed notification durations may be required months in advance.

The DSA process will be of particular value on the project in relation to the following elements:

» Early works within a tenanted area prior to shutdown of CBW or that could affect adjacent occupants
» Works that may affect the services to a tenanted area
» Activities in the general public realm
» Works that may affect local traffic flow
» Works that may exceed the agreed noise and vibration criteria
» Major services changeovers or shutdowns.

The benefits to all parties of the DSA process include:

» Proposed works are planned in detail
» Stakeholders are briefed on the proposal
» Stakeholders are empowered and become active participants in the project
» Early dissemination of this information effectively to relevant team members
» Works are undertaken in a more controlled and diligent manner.

6.3.3 Complaints Response Process

The complaints response process for the Project will be outlined in the Communication Plan when it is developed. This Plan will describe the Contractor's approach and procedures for communication with internal and external stakeholders, necessary territory authorities, and the public.

6.3.4 Emergency Contact

The initial point of contact for the Project for complaints will be the Project Manager and the Site Manager.

Project Manager: TBC

Site Manager: TBC

As other key personnel commence onsite, further names and contact numbers will be issued and displayed prominently on sign boards.

7. Public Amenity, Safety and Pedestrian Management

7.1 Hours of Work

General demolition and construction works will be undertaken within the hours permitted under the development approval. For works over the Western Distributor and Harbour Street without overhead protection, road closures will need to be approved and coordinated under the WAD.

Working hours are foreseen as follows:

» Between 7am and 7pm Monday to Friday
» Between 7am and 6pm Saturday
» No working Sundays or public holidays
» Night works on roads expected between 9pm and 5am Sunday to Friday nights at a minimum

7.2 Noise & Vibration Management

Particular care will need to be taken during the construction of each phase of the project to control noise and vibration. Work methodologies and plant selection for demolition and excavation will be reviewed to determine the most practical and programme-effective solutions for these works. This active approach will mitigate the potential for human discomfort and noise and vibration disruptions to surrounding key stakeholders.

Noise and vibration transfer from the construction process could potentially have an impact upon adjacent building tenants, the public and surrounding premises. Vibration could also potentially affect the heritage fabric of the Pyrmont Bridge.

Prior to the commencement of any works onsite a Noise and Vibration Management Plan will be developed by the Contractor in consultation with the Stakeholders to develop strategies for the mitigation of noise and vibration generated by the works. In order to help meet the noise and vibration requirements of the site, baseline testing will be carried out and existing operational levels identified. Early identification of baseline levels will enable subcontractor methodologies to be specifically tailored to ensure the benchmarks are not exceeded.

Vibration and noise generating activities will be coordinated and undertaken in consultation with the appropriate parties and carried out during the subsequent agreed periods. Work methodologies and plant selection will be reviewed to mitigate the potential for noise and vibration from the new works effecting pedestrians and patrons of Darling Harbour and its businesses.

Work practices that minimise noise and vibration will be used wherever possible. These include but are not limited to the following:

» Flexible working hours avoiding noisy work during peak business operation times
» Plant and equipment selection to reduce noise where possible
» Plant and equipment fitted with silencers where possible
» Acoustic testing of proposed methodologies prior to commencing work
» Erection of temporary screens to encapsulate dust and noise
» Diligent housekeeping to minimise the generation of dust
» Methodology development aimed at finding alternatives capable of reducing noise and vibration where possible
» Location of major plant such as cranes away from noise and vibration sensitive areas where possible.

The following items outline some of the Contractors key control measures which will be applied during the demolition and construction phase to assist with noise reduction:

» Plant known to emit noise strongly in one direction would, where possible, be orientated so that noise is directed away from noise sensitive areas.
» Machines fitted with engine covers would be kept closed when not operating.

- The height materials are placed either into or out of trucks, would be limited where possible.
- Stationary and mobile equipment including offsite vehicles would be maintained regularly.
- Operation would be limited to occur within the approved hours.
- Continuous training through inductions and ongoing meetings would be provided for operators, labourers, subcontractors and supervisors, to keep minimal noise impacts on local residents and businesses top of mind.
- Notifications of particularly noisy works would be undertaken prior to any planned works commencing. This would include either personal or community meetings with adjoining properties owners and/or tenants, this process will be undertaken in particular prior to Demolition and Excavation phase of the project.
- Regular servicing of equipment , or when an individual plant item are identified as being particularly noisy, would be conducted.
- A construction noise monitoring plan for the construction period prior to commencing works would be designed and implemented.
- All complaints in relation to noise would be monitored and recorded.
- An onsite person would be identified as the contact point in the event of noise complaints with contact details provided within the Construction Management Plan.

7.2.1 Monitoring

The Contractor will engage an independent acoustic / vibration consultant to install and monitor noise and vibration logging equipment at suitable locations. These monitors will be calibrated and programmed to an agreed level with an alarm being triggered in the event of vibration or noise exceeding the acceptable range. This alarm will automatically page the nominated Contractor's liaison officer. In the event of such an incident works will cease in the specific area and be reviewed. If appropriate, alternate methods will be considered and adopted.

Noise monitoring

Noise monitoring will be undertaken to monitor and help minimise construction noise in order to avoid discomfort to the occupants of surrounding premises.
The specific noise monitoring methods that will be used will be outlined in the Construction Noise Plan.

- ***Unmanned Noise Monitors***

  These monitors are programmed to notify 'back to base' and alarm locally whenever noise exceeds the required level. They are also linked back to software programs that are used for monthly noise reports and specific incident reporting. Locations for the monitors are selected strategically based on assessment of the nearest affected receivers. Should they be installed in an unsecure location, typically the noise monitoring equipment would be housed in a steel cage to prevent damage, theft or vandalism.
- ***Manned Noise Monitors***

  Manned noise monitoring will be undertaken to assess specific and new work methodologies when required. Construction methods will be reviewed and changed if required.
- Noise Reports will be prepared on an as required basis i.e. monthly.
- Community Liaison will be carried out if required to address any community concerns regarding noise.

Vibration Monitoring

Vibration monitoring during the demolition and new structure phases will be undertaken in order to monitor potential human discomfort and potential structural / heritage damage in and around the existing building.

The specific vibration monitoring methods that will be used are identified within the Construction Vibration Plan.

- Upon establishment of the required vibration monitoring equipment, monitoring will be carried out on a regular basis to ensure work is being undertaken within the agreed vibration levels. Working hours, work methods and site practices will be reviewed accordingly.
- Vibration monitoring reports will be prepared on an as required basis i.e. monthly or incident reporting.

Monitoring will be carried out on a regular basis throughout the project. The four main activities of work that are expected to provide vibration and noise that will require monitoring are:

- Soft Strip out
- Demolition

» Structural new build works
» Fit-out / finishes
» Heritage restoration works.

7.3 Public Safety

Works will be undertaken with public safety as a significant consideration. Class A and B type hoardings will generally be erected around the site perimeter and where construction is occurring over or adjacent to public thoroughfares.

Formwork screens will be utilised to secure leading edges during construction of structural elements.

General safety measures will be undertaken as standard practice such as scaffolding around demolition works, adequate lighting, safety signage, provision of site security, flashing lights at vehicle cross overs, and physical barriers between construction works areas and public access areas.

7.4 Pedestrian Management

To allow for continuous public access, materials handling and management of pedestrian safety, some diversions from existing pedestrian routes will be required for large periods of the work. The installation of way finding signage and lighting will be professionally managed to ensure clear pedestrian understanding and preservation of safety and amenity.

8. Traffic Management

The Contractor will prepare a detailed Traffic Management Plan prior to the issue of a Construction Certificate. Traffic will generally be managed in the following way:

» Designated transport routes will be communicated to all personal, and enforced
» Designated peak hour and non-peak hour delivery vehicle waiting areas
» Strict scheduling of vehicle movement will occur to minimise off site waiting times
» On-site parking will not be provided , and site workers will be encouraged to utilise public transport
» Vehicle movements will be compliant with conditions of Consent and broader road-use regulations, particularly with regard to hours of work, materials loading and unloading, and over size deliveries and installation
» Stakeholder feedback will be incorporated into traffic plans if appropriate.

For more detail regarding traffic management and road closures please refer to the 'Principles of Construction Traffic Management' report produced by Colston Budd Rogers & Kafes Pty Ltd.

8.1 Traffic and Pedestrian Management

A site specific Traffic Management Plan will be produced for each phase of the project works to ensure vehicle movements to, around and from the site do not affect traffic arterials within the vicinity of the project or pedestrian movements around it.

The contractor will manage traffic associated with the site to minimise the impact on the local area. The Traffic Management Plan will be incorporated in subcontractor agreements and the key points communicated to the workforce through the site induction procedures.

8.2 Site Access

Access to the Site will be available at various times via the Darling Harbour Promenade as well as the site gates for construction vehicles at either end of the portion of Wheat Road proposed to be closed at commencement.

Heavy and wide loads will be coordinated with the relevant authorities and stakeholders for approval, so as to minimise traffic impact during work hours. The majority of heavy and wide loads will adhere to transport curfews in the case of the precast concrete girders.

Onsite traffic management will be finalised with each stage of the works, as appropriate. Ongoing liaison with the relevant authorities will occur throughout.

9. Environmental Management

An Environmental Management Plan will be developed to provide a coordinated high level plan that details, at a Project level, the environmental management strategies and procedures that will be adopted on the Project on which Multiplex may operate as the Principal Contractor.

This plan will be a sub-plan of the Project Management Plan, which forms part of the Multiplex Management System which is certified to:

» AS/NZS ISO 9001:2008 – Quality Management System

» AS/NZS ISO 14001:2004 – Environmental Management System

» AS/NZS 4801:2001 – Occupational Health and Safety Management System

» New South Wales Government Accreditation Scheme.

9.1 Focus Areas

The following areas/features of the Project have been identified as posing potential risk to the environment during construction:

» Works to the new podium deck west of the sea wall – this includes demolition of the existing slab, piling and concrete pouring.

» Exposure of Potential Acid Sulphate Soils during core excavation

» Site discharge during demolition and excavation works

» Potential effects of noise and vibration on marine life

» Potential water and air contamination

The Environmental Management Plan will address these concerns through sub-plans including, but not limited to:

» Spill Management

» Air Quality Management

» Waste Management

» Noise and Vibration Management

» Liquid Waste

» Water Quality

» Disturbance of Flora and Fauna

» Indigenous and European Heritage

» Visual Amenity

» Refuelling

» Groundwater Management

9.2 Harbour Protection Methodology

Successful implementation of well-considered methodologies and water protection measures will be crucial to the Environmental Management of the Project. Multiplex has consulted Waterway Constructions for their expertise in demolition and piling in marine environments.

In order to construct the piles for the proposed podium structure, portions of the existing promenade slab will need to be cut out. The existing documentation indicates a precast plank system with a topping slab supported on steel columns with a headstock beam. An appropriate methodology for the new podium piles may include:

- A temporary grillage/machine platform to support the piling rigs and excavators
- A sawcut and lift approach with methods to minimise dust and slurry
- The use of a barge positioned on the harbour below the promenade to catch any falling debris
- A silt curtain established along the boundary to provide an added defence to dust, sediment and debris
- Steel caissons to minimise silt disturbance and provide formwork to the new concrete piles.
- A maintenance and monitoring plan for harbour protection measures to continue to be in effect until project completion.
- Protection of Sea Wall and Stormwater Outlets

9.3 Occupational Health & Safety

The Contractor will be the nominated “Principal Contractor” as required under the WHS Act. This role will require the careful and controlled management of worker and public safety. Detailed methodologies are yet to be developed, however typical approaches include job training, toolbox talks, and implementation of emergency management plans, safe work method statements, weekly WHS meetings and audits to confirm compliance.

The Contractor will be required to report on WHS on a regular basis.

9.4 Hazardous Materials

Consultant survey works are required in order to establish existing site conditions and identify any remediation works that may be required. This investigation would include:

- Hazardous material (Hazmat) survey of the existing structures
- Any additional requirements for soil classification, sampling and analysis works
- Community liaison plan to be established and contact made with relevant authorities.

In the event that hazardous materials are uncovered once site works have commenced, the following procedures and principles will be followed; this would be consistent for expected and unexpected hazardous materials:

- Notification to client and project stakeholders
- The contractor to develop a remediation management plan
- Advise the client of the most cost and time efficient solutions whilst adhering to industry best practice standards
- Agree strategy and commence implementation.

With asbestos for example, all employees need to be trained in the recognition of asbestos and synthetic mineral fibre (SMF) as part of their employers Safe Work Method Statements (SWMS). Employees would cease work on discovering any Hazmat not identified in the report and then inform their supervisor who would arrange for the appropriate action to be taken.

General procedures for hazardous materials removal (including asbestos) will usually be carried-out as follows, but often specific details and procedures will be developed upon material identification. Detailed work method statements will be produced identifying processors such as:

- The area to be decontaminated to be bunted off at a minimum 10 metre radius
- Asbestos warning signage to be erected to inform people of the nature of the work being carried out
- ‘No Unauthorised Access’ signage to be erected
- Water points to be established
- Personal Protective Equipment (PPE) including but not limited to Hard Hat, Safety Boots, Disposable Coveralls, Gloves, Masks and Glasses to be worn at all times when in the Hazmat removal zone
- All personnel involved in the removal of asbestos to have attended and completed the approved Work cover courses and to be the holders of valid, Work Cover approved asbestos removal licenses
- Tools and equipment appropriate to the type of asbestos containing material to be used for its removal in order to minimise the disturbance of the material thus preventing the release of fibres

» Where appropriate, water to be used to keep the material slightly damp thus minimising the chances of dust and fibres being released
» All asbestos waste to be wrapped in 200µm plastic and tightly secured
» All asbestos waste to be removed from site and disposed at a licensed EPA asbestos disposal facility
» Asbestos waste to be removed at the end of each shift. Stockpiling of asbestos will not be permitted
» Clearance certificates to be provided on completion of Hazmat Removal.

The protection of all council infrastructure including trees, overhead cables, and existing services will be managed to ensure that all infrastructure is maintained, and in the same condition at the completion of the project.

The following protection procedure will be adopted:

» Ensure all existing services are identified, and terminated or diverted as appropriate
» Ensure movement or placement of construction plant does not damage infrastructure
» At the beginning of construction we will advise adjoining and nearby properties of commencement date, possible disruptions and approximate construction time.

9.4.1 Site Remediation and Hazardous Materials

Consultant survey works have already been carried out to establish existing site conditions and to identify any remediation works that may be required. As hazardous materials have already been identified procedures and principles have been developed. These procedures and principles will be consistent for expected and unexpected hazardous materials. They are outlined below:

» Notify client and project stakeholders
» Develop a Remediation Management Plan
» Advise the client of efficient solutions according to industry best practice standards
» Agree strategy and commence documentation of DSA (Disruption Shutdown Applications)
» Communicate DSA to all stakeholders
» Validation of Remediation Action Plan upon completion of hazardous material removal.

Hazardous substances supplied to the project will be approved for use and accompanied by a current Material Safety Data Sheet (MSDS). All hazardous substances will be registered, correctly stored, decanted, used and disposed in accordance with the MSDS and regulatory requirements. Employees will be trained in the Safe Work Method Statement (SWMS) based on the MSDS and provided with the appropriate Personal Protective Equipment (PPE).

9.5 Site Discharge

Any discharges from the site will be strictly controlled to ensure hazardous materials and contaminants are contained to authority requirements and do not pollute the council storm water system or Darling Harbour. The contractor will have within its standard procedures, the requirement of spill kits for hazardous materials also including environmental audits that review the usage and storage of hazardous materials onsite.

9.5.1 Dewatering

The Developer and Contractor are committed to the management of water discharge from the site throughout the duration of the project. To ensure effective management, a ‘Water Quality Management Plan’ as a sub-plan to the Environmental Management Plan will be implemented.

Key management strategies include:

» Objective – Avoid the release of contaminants to waterways / drainage systems
» Target – All water discharged complies with the Healthy Waters State Planning Policy
» Measure – Water Quality records confirming compliance with pre-discharge limits.

These and other water quality aspects at the Site will be controlled by:

» Weekly environmental inspections
» Water quality recording

» Training for responsible staff
» Tool Box talks for trade staff
» Subcontractor Environmental Work Method Statements.

9.5.2 Silt Protection

A stormwater and sediment control plan will be developed to ensure that stormwater from the project does not enter the harbour without being filtered, and that no water entering the council stormwater system contains silt or other contaminants.

The stormwater and sediment control plan includes but is not limited to providing further detail to the below key control measures:
» Extent/location of silt protection to be installed
» Extent of silt curtains to be installed along Cockle Bay
» Extent/location of sediment basins to be installed
» Regular weekly checks of silt fences, banks and the like
» Specific checks after any significant storm event to ensure integrity and performance of silt protection
» Sediment fences to be repaired as required and excessive sediment deposits should be removed
» Water quality samples must be taken and analysed prior to the release of any water from the sediment pond/catchment
» All water quality data including dates of rainfall, testing and water releases must be maintained in an onsite register
» Maintenance and cleaning of adjoining/surrounding access roads.

9.6 Dust Control

Dust control will be implemented in areas of all active demolition and construction. Dust control will also be implemented within the construction zone as determined by the Contractor, and as required for the health and safety of employees.

All works will be undertaken in accordance with a ‘Construction Air Quality’ sub-plan as part of the Environmental Management Plan. Dust control measures will be implemented as required, and in accordance with Protection of the New South Wales Environment Operations Act. Dust management will be most critical during the demolition and excavation phases of the project. All subcontractors involved with these works will be required to provide Environmental Work Method Statements that specifically address dust management.

Methods of reducing dust that will be implemented are:

» Encapsulating work zones through the construction of engineer designed full height dust proof scaffolds / hoardings
» Reviewing tool and plant selection in an attempt to select plant with superior acoustic performance
» Utilising concrete saw cutting techniques to reduce dust generation
» Continuous cleaning throughout dust generating work activities

Ensuring demolition debris skips are covered at all times.

» Site perimeter – Solid panel hoarding will be provided on the boundary during the overall construction phase and perimeter scaffolds clad in shade cloth will be provided during demolition to minimise the escape of dust
» Demolition and excavation – Working surfaces will be watered down as required with stock piling of material minimised
» Plant movement within the basement will be minimised with all loads covered before exiting the site and a stabilised driveway maintained
» Construction – A high level of housekeeping to minimise the likelihood of windblown dust and the banning any dry grinding will be maintained.

9.7 Waste Management

It will be part of the Contractor's philosophy that a tidy site is a safe site, and this principle will be maintained throughout the demolition and construction duration. Rubbish bins/skips will be provided at strategic positions around the site, where all subcontractors will be required to clear their rubbish as it accumulates. These bins will be brought down the building in the construction hoists / builders lifts and loaded via forklift into the large skips for removal from site.

A specific Waste Minimisation Plan will be developed in accordance with the Contractor's Environmental Management System to ensure optimum waste management initiatives are implemented.

The Contractor will develop a Waste Minimisation Plan that is included as a sub plan of the Environmental Management Plan for the Project. The aim of this plan is to work at best practice in minimising the amount of waste produced during the development and manage that waste in order to reduce the amount going to landfill.

The Waste Minimisation Plan (WMP) will exceed regulatory requirements and meet compliance with potential Green Star benchmarks set for the CBP Tower. In setting such high standards and to achieve waste re-use and recycling onsite, the site-specific Waste Minimisation Plan will be implemented. The Contractor's project team will be trained in the WMP and the subcontractors informed on variations to the required changes from the industry 'business-as-usual' approach.

Subcontract trade packages will be prepared and tendered to ensure optimum recycling through Waste Management achieves the required Green Star targets.All rubbish will be removed from site on a daily basis via wheelie bins and deposited in bins/skips which will be provided at strategic positions onsite. Where space permits, the Contractor will also provide specifically labeled recycling bins for materials such as cardboard and plasterboard to maximise the amount of material able to be recycled.

In addition, all subcontractors are responsible for removing their own packaging and other re-usable items such as pallets from site. Adopting this policy:

» Promotes recycling by subcontractors and suppliers

» Removes unnecessary packaging at the source rather than at site

» Reduces the amount of rubbish being sent to land fill.

Monthly reports detailing the overall percentage of rubbish being recycled will be provided by the waste disposal contractor. This information will enable the effectiveness of the implemented waste management strategies to be monitored and appropriate steps to be taken if necessary to improve.

9.8 Recycling

Further to Section 9.5 Waste Management, detailed recycling programs will be developed for both demolition and construction phases of the works. The site subcontractors will be required to report on extent of recycling achieved and be subject to Environmental Audits.

10. Drawings

10.1 DP4-CMP-SK01- SK06 – Construction Staging Plan

10.2 DP4-CMP-SK07- SK08 – Construction Traffic Methodology

10.3 DP4-CMP-SK09 – Tower Crane Layout

10.4 DP4-CMP-SK10 - 22 – Land bridge Foundations and Construction Methodology

10.5 DP4-CMP-SK23 – Area Access Plan

10.6 DP4-CMP-SK24 – Precast Infills Over Temporary Access Road

EARLY WORKS - TEMPORARY ROAD ADJUSTMENTS

DP4-CMP-SK01
CONSTRUCTION STAGING PLAN
EARLY WORKS

MULTIPLEX

GPT The GPT Group

Brookfield

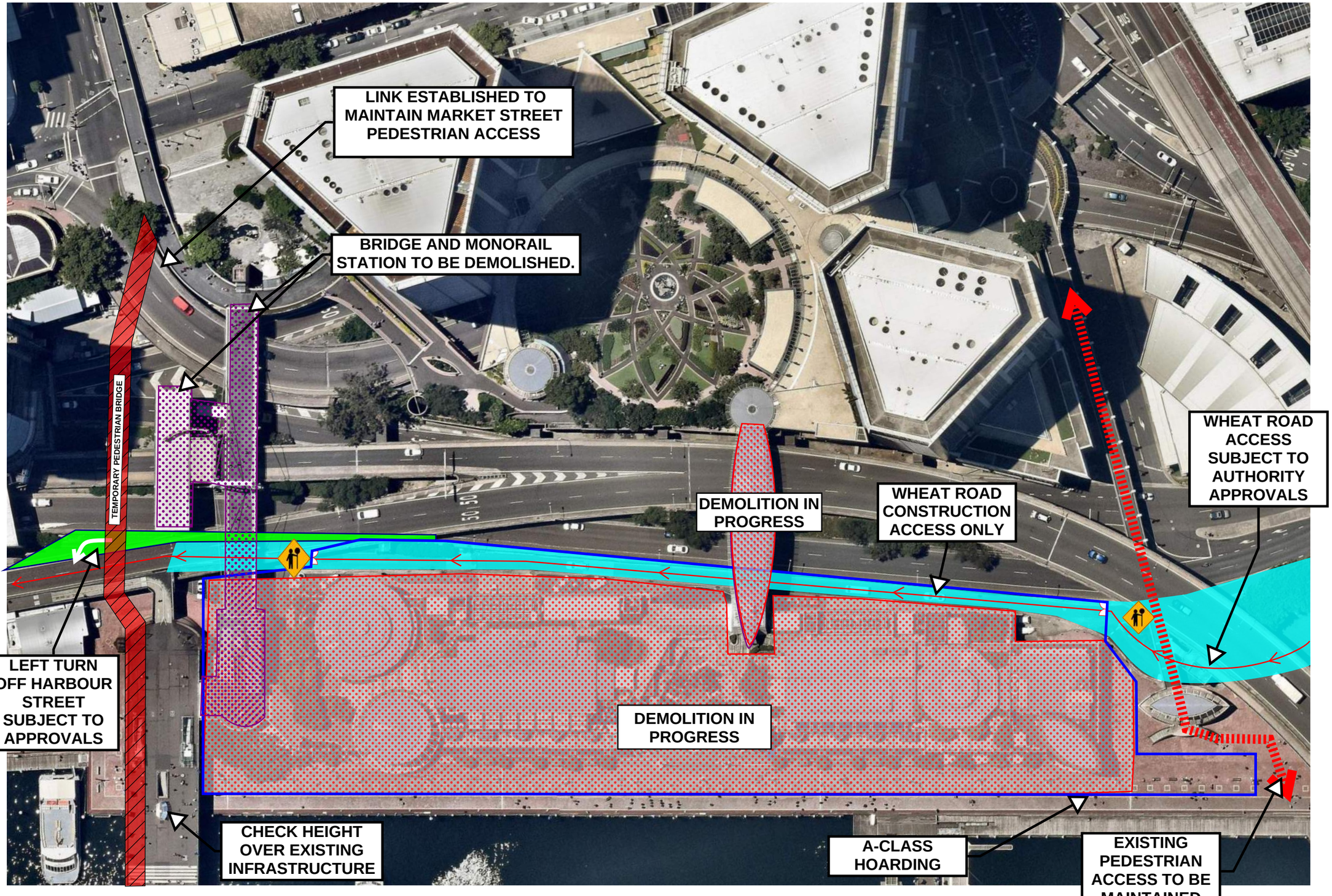
AMP CAPITAL

Project
Cockle Bay Park Project

Drawing
Construction Staging Plan - Part 1

Drawing ID
DP4-CMP-SK01

Date
01/08/2017



1 OF 5

DP4-CMP-SK02
CONSTRUCTION STAGING PLAN
PART 1

MULTIPLEX

GPT The GPT Group

Brookfield

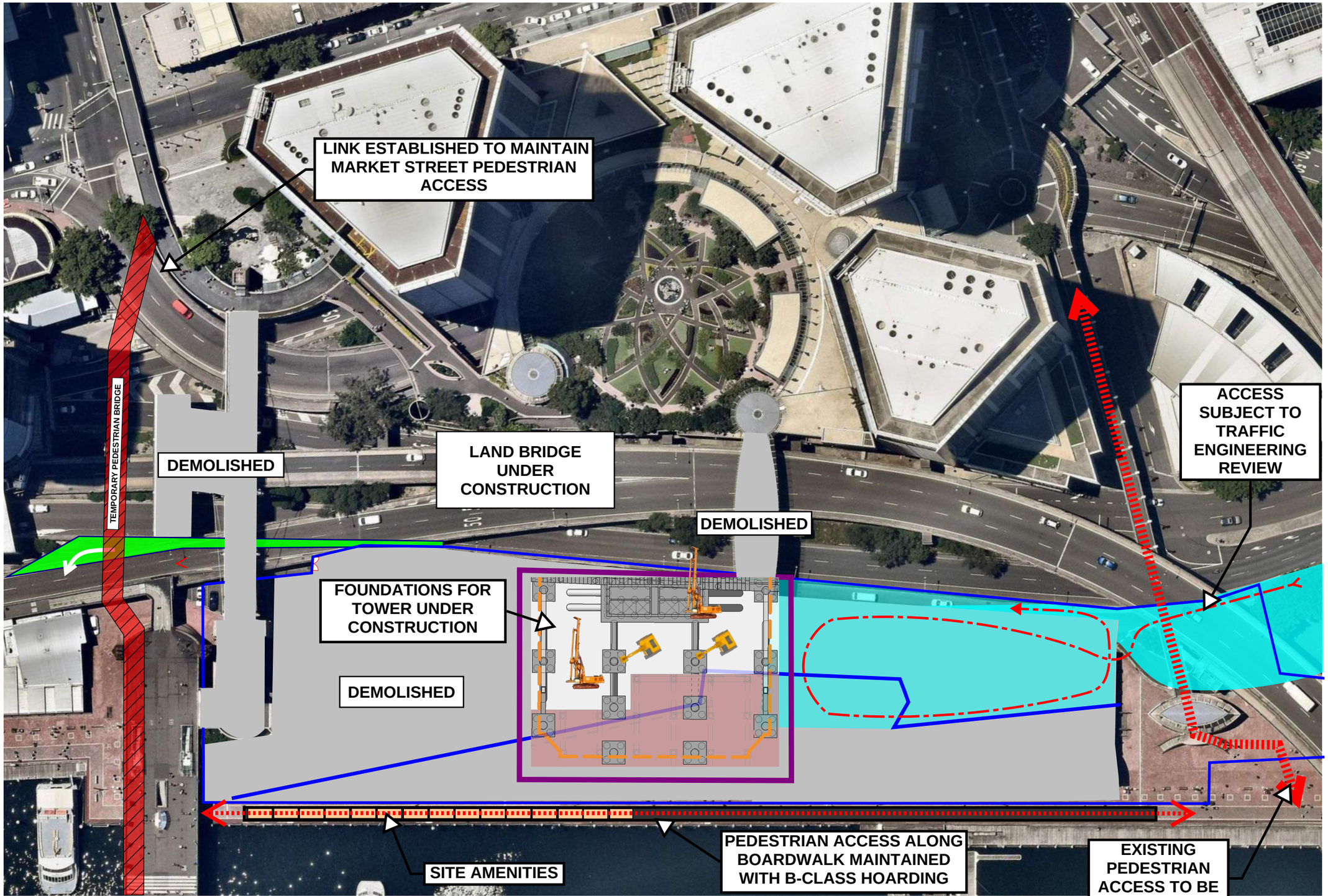
AMP CAPITAL

Project
Cockle Bay Park Project

Drawing
Construction Staging Plan - Part 1

Drawing ID
DP4-CMP-SK02

Date
01/08/2017



NOTE: TOWER AND PODIUM CONSTRUCTION METHODOLOGIES WILL BE CONFIRMED FOLLOWING DETAILED DESIGN FINALISATION AND INCLUDED AS PART OF THE STAGE 2 DA.

DP4-CMP-SK03
CONSTRUCTION STAGING PLAN
PART 2

MULTIPLEX

The GPT Group

Brookfield

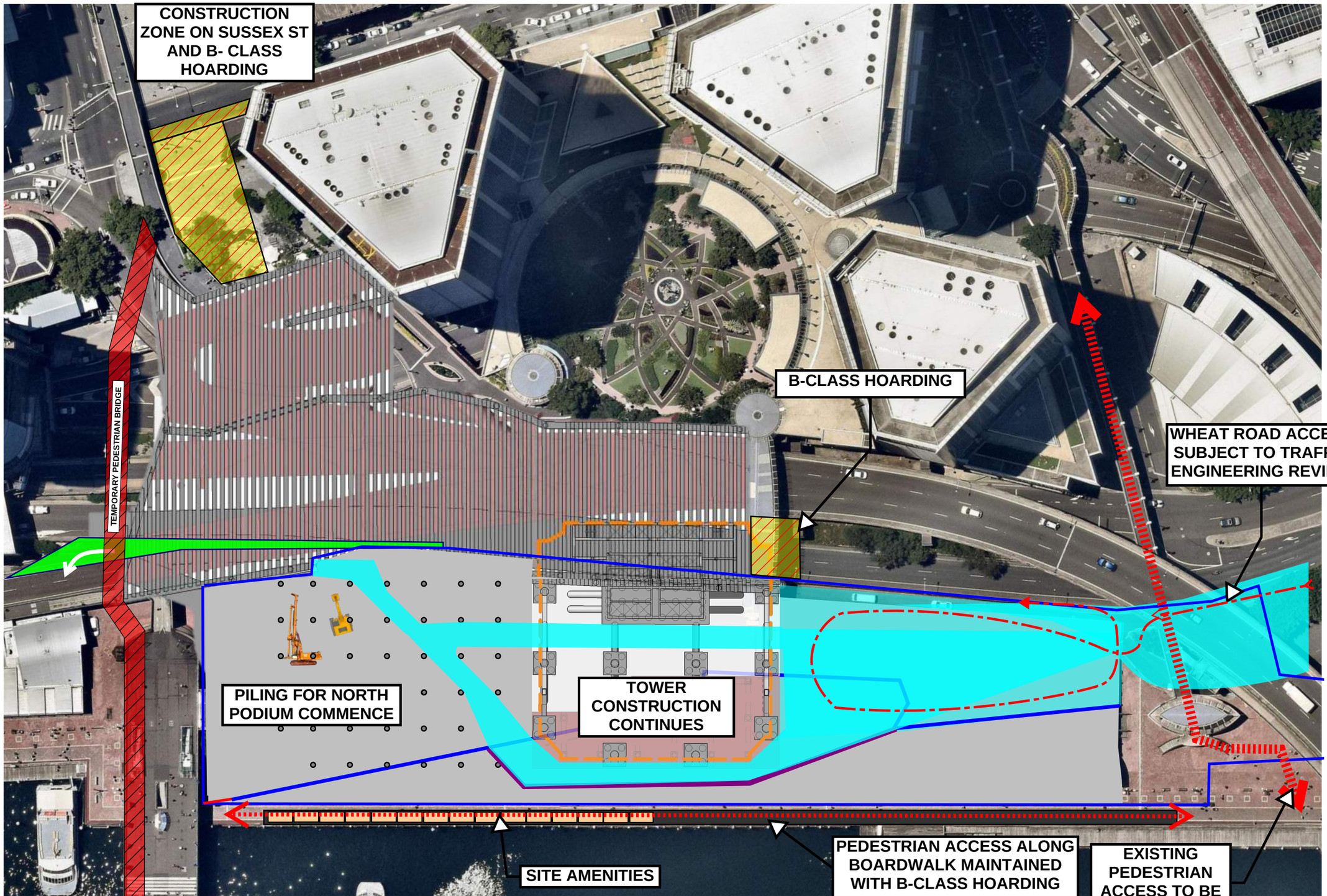
AMP CAPITAL

Project
Cockle Bay Park Project

Drawing
Construction Staging Plan - Part 2

Drawing ID
DP4-CMP-SK03

Date
01/08/2017



DP4-CMP-SK04
CONSTRUCTION STAGING PLAN
PART 3

MULTIPLEX

GPT The GPT Group

Brookfield

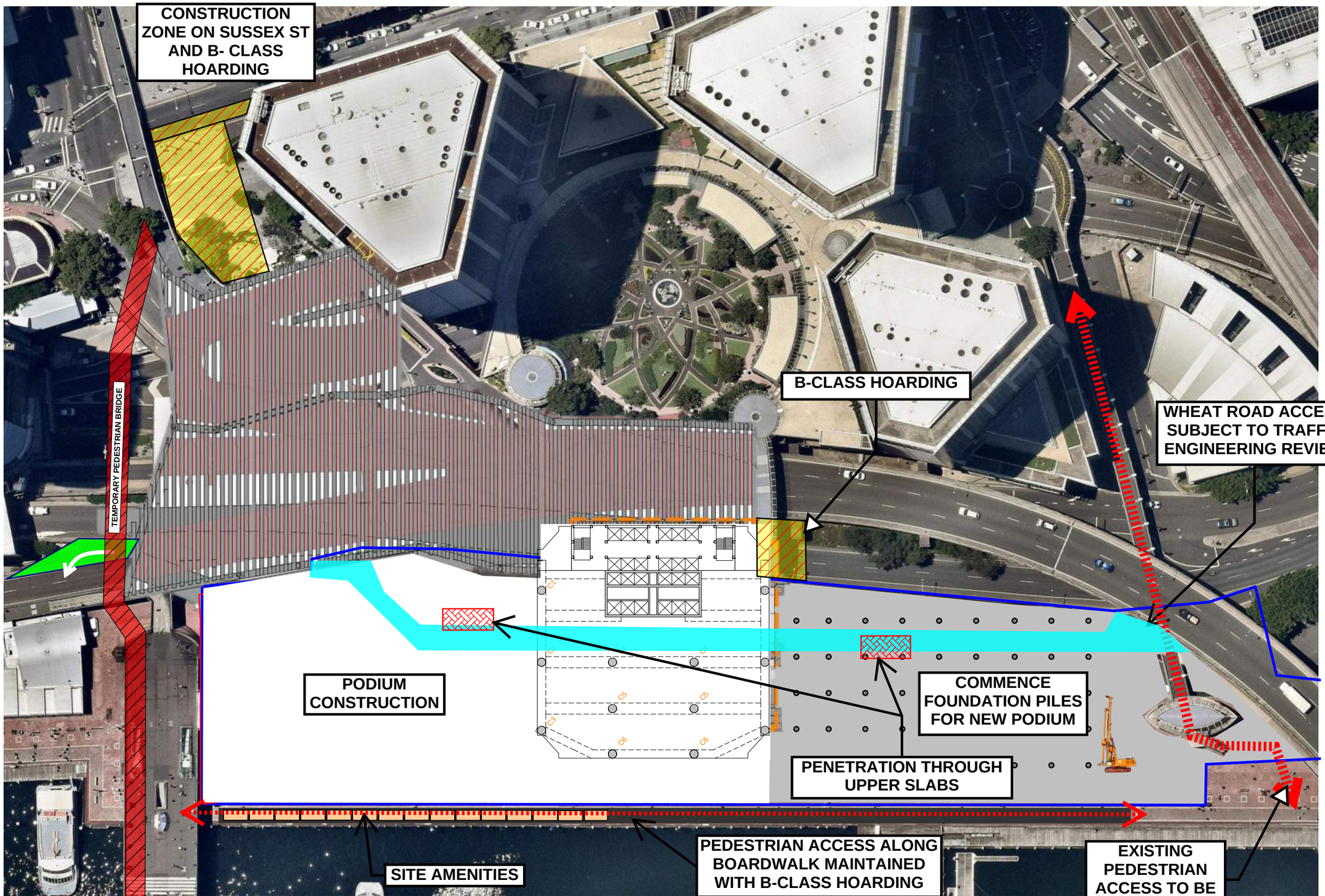
AMP CAPITAL

Project
Cockle Bay Park Project

Drawing
Construction Staging Plan - Part 3

Drawing ID
DP4-CMP-SK04

Date
01/08/2017



DP4-CMP-SK05
CONSTRUCTION STAGING PLAN
PART 4

MULTIPLEX

GPT The GPT Group

Brookfield

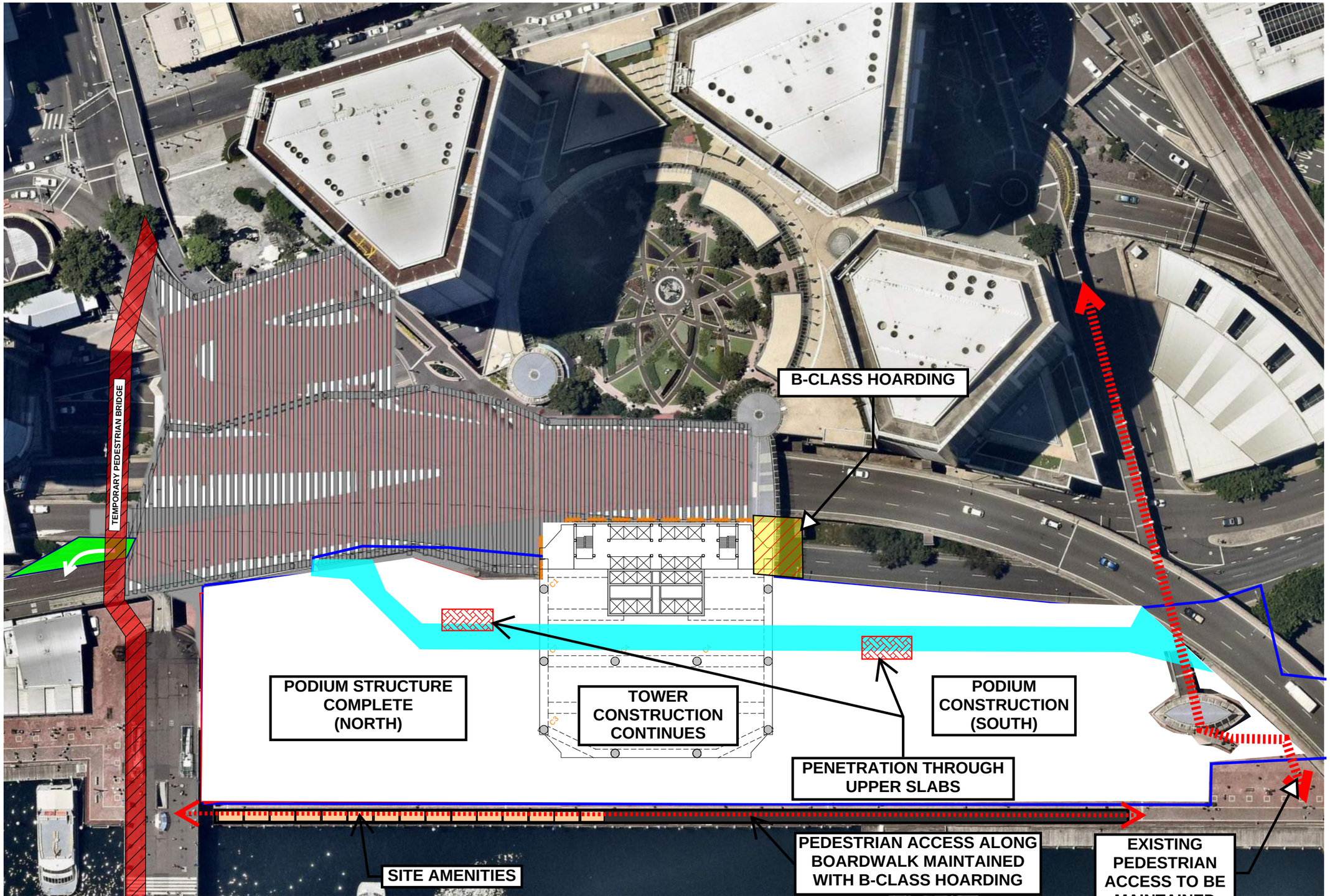
AMP CAPITAL

Project
Cockle Bay Park Project

Drawing
Construction Staging Plan - Part 4

Drawing ID
DP4-CMP-SK05

Date
01/08/2017



DP4-CMP-SK06
CONSTRUCTION STAGING PLAN
PART 5

MULTIPLEX

GPT The GPT Group

Brookfield

AMP CAPITAL

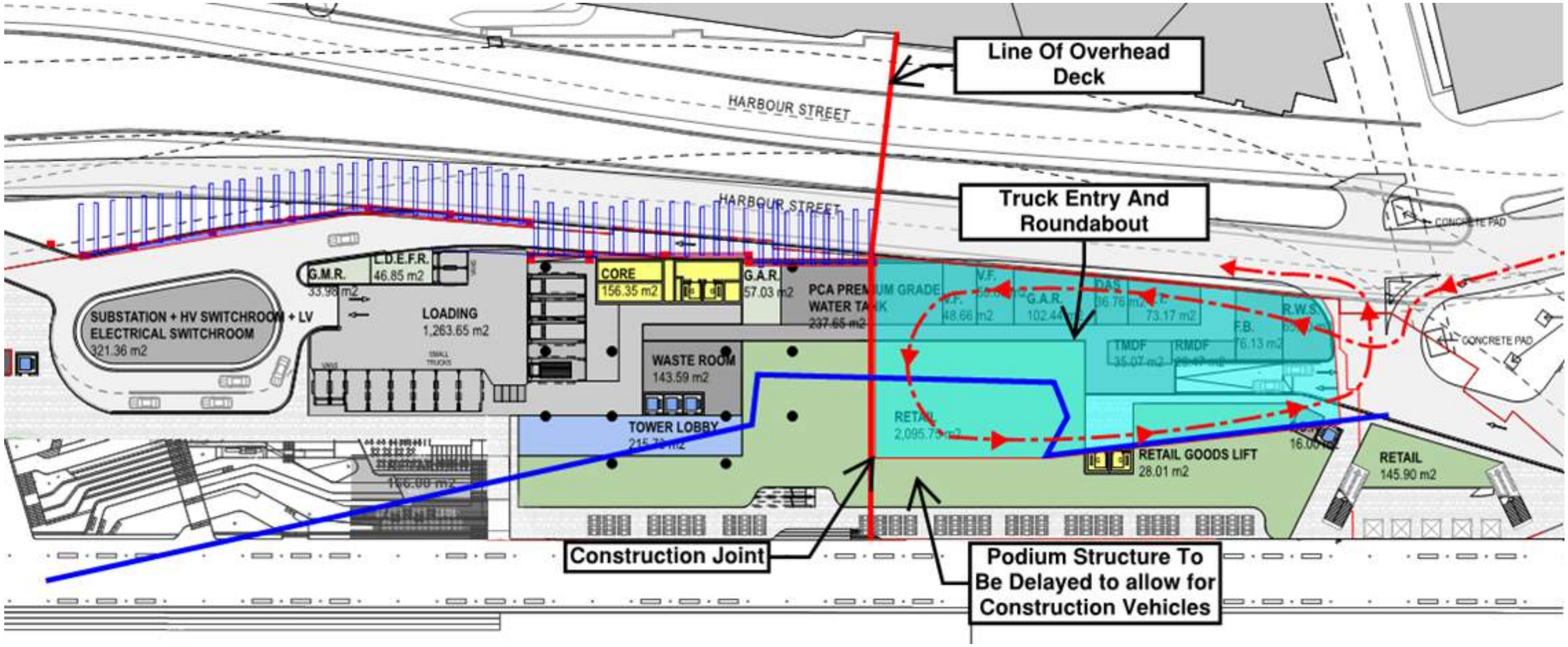
Project
Cockle Bay Park Project

Drawing
Construction Staging Plan - Part 5

Drawing ID
DP4-CMP-SK06

Date
01/08/2017

Stage 1 Construction Traffic Methodology



DP4-CMP-SK07
STAGE 1 CONSTRUCTION TRAFFIC METHODOLOGY

MULTIPLEX

GPT The GPT Group

Brookfield

AMP CAPITAL

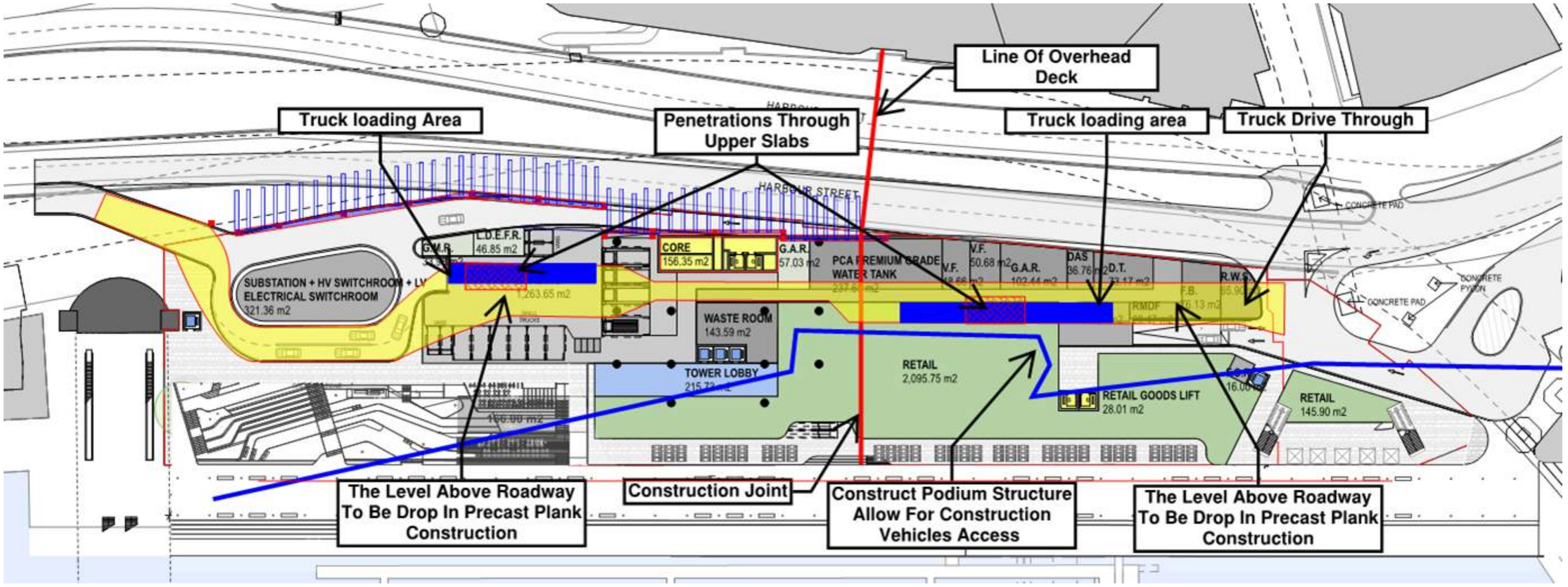
Project
Cockle Bay Park Project

Drawing
Stage 1 Construction Traffic Methodology

Drawing ID
DP4-CMP-SK07

Date
01/8/2017

Stage 2 Construction Traffic Methodology



DP4-CMP-SK08
STAGE 2 CONSTRUCTION TRAFFIC METHODOLOGY

MULTIPLEX

The GPT Group

Brookfield

AMP CAPITAL

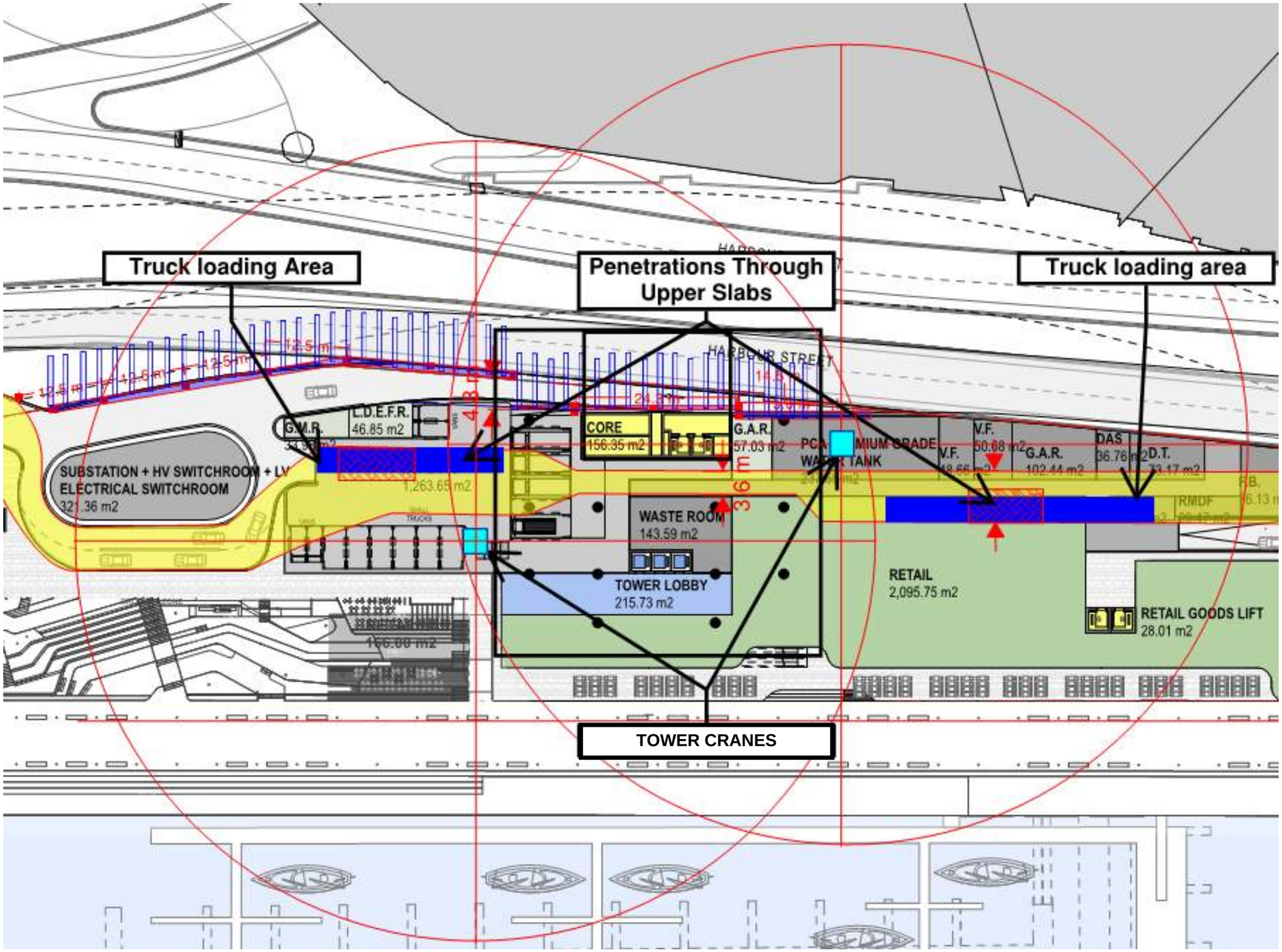
Project
Cockle Bay Park Project

Drawing
Stage 2 Construction Traffic Methodology

Drawing ID
DP4-CMP-SK08

Date
01/8/2017

Tower Crane Layout



DP4-CMP-SK09
TOWER CRANE LAYOUT

MULTIPLEX

GPT The GPT Group

Brookfield

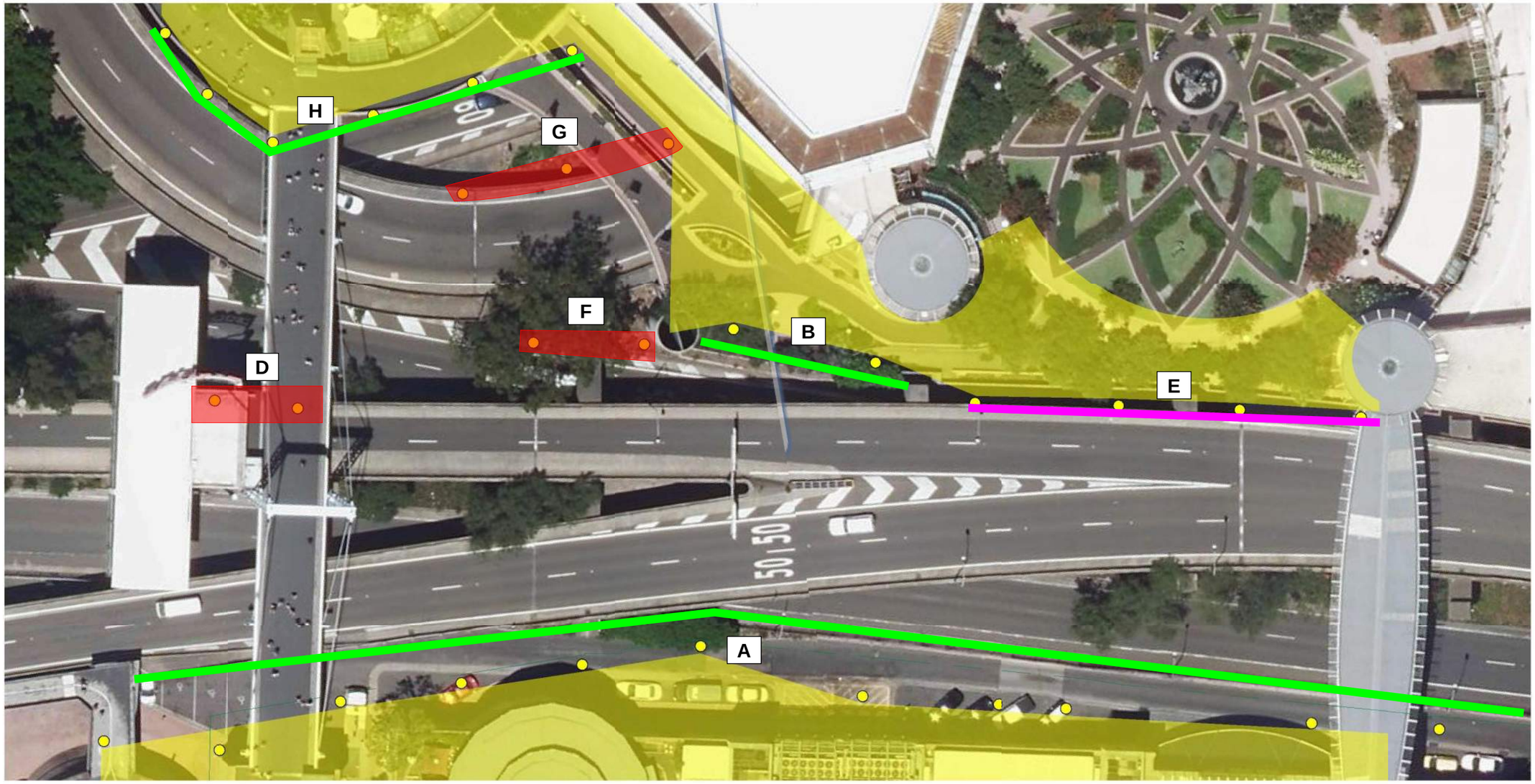
AMP CAPITAL

Project
Cockle Bay Park Project

Drawing
Tower Crane Layout

Drawing ID
DP4-CMP-SK09

Date
01/8/2017



ZONE A - Road Closure to install and remove Screen Only. All Access internally

ZONE B - Road Closure to install and remove Screen Only. All Access internally.
Note these works are inside an existing substation and required further investigations.

ZONE D - Road Closure to Install Hoardings and Construct Footings and Columns

ZONE E - Road Closure to install Screen and Single Lane Closure For Material Access at Night

ZONE F - Road Closure to Install Hoardings and Construct Footings and Columns

ZONE G - Road Closure to Install Hoardings and Construct Footings and Columns

ZONE H - Road Closure to install and remove Screen Only. All Access internally

DP4-CMP-SK10
LANDBRIDGE FOUNDATION
LAYOUT AND ACCESS

MULTIPLEX

GPT The GPT Group

Brookfield

AMPCAPITAL

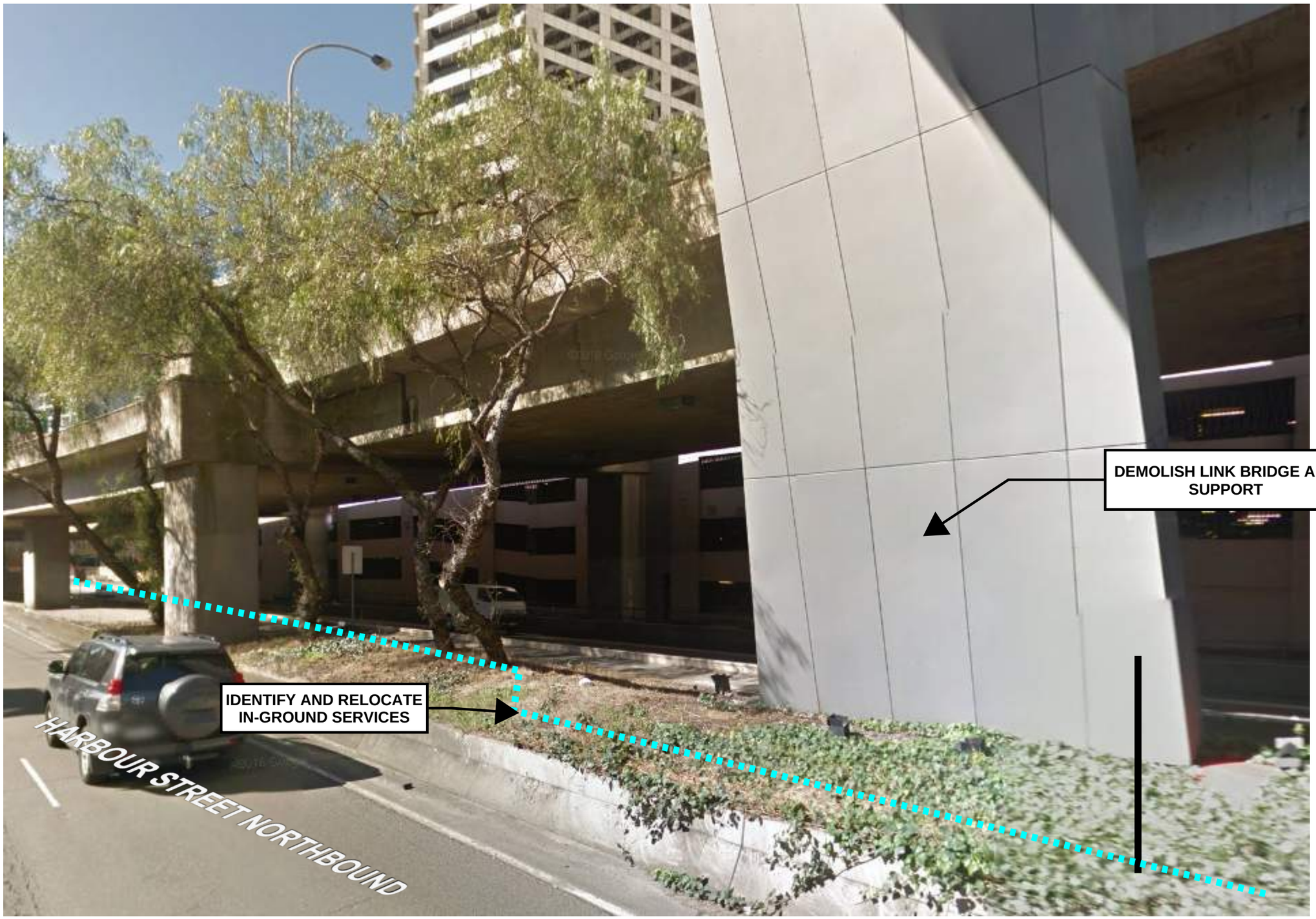
Project
Cockle Bay Park Project

Drawing
Landbridge Foundation
Layout and Access

Drawing ID
DP4-CMP-SK10

Date
01/8/2017

TYPICAL CONSTRUCTION METHODOLOGY - ZONES A, B ,D, E, F, G AND H



DP4-CMP-SK11
LANDBRIDGE FOUNDATIONS
DEMOLITION AND SERVICES

MULTIPLEX

The GPT Group

Brookfield

AMP CAPITAL

Project
Cockle Bay Park Project

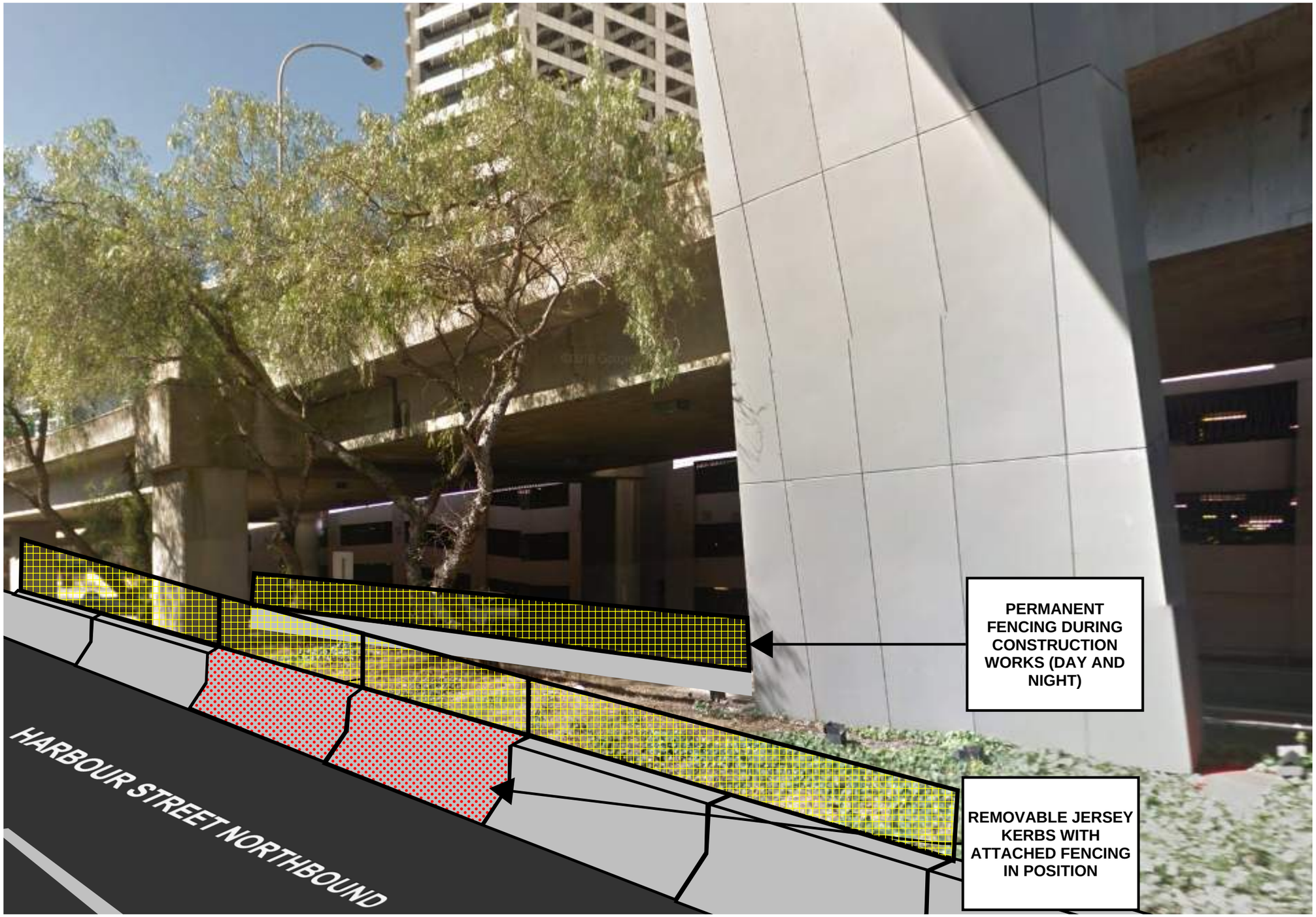
Drawing
Landbridge Foundations

Demolition and Services

Drawing ID
DP4-CMP-SK11

Date
7/8/2017

TYPICAL CONSTRUCTION METHODOLOGY - ZONES A, B ,D, E, F, G AND H



DP4-CMP-SK12
LANDBRIDGE FOUNDATIONS

SCREENS AND KERBS

MULTIPLEX

The GPT Group

Brookfield

AMP CAPITAL

Project
Cockle Bay Park Project

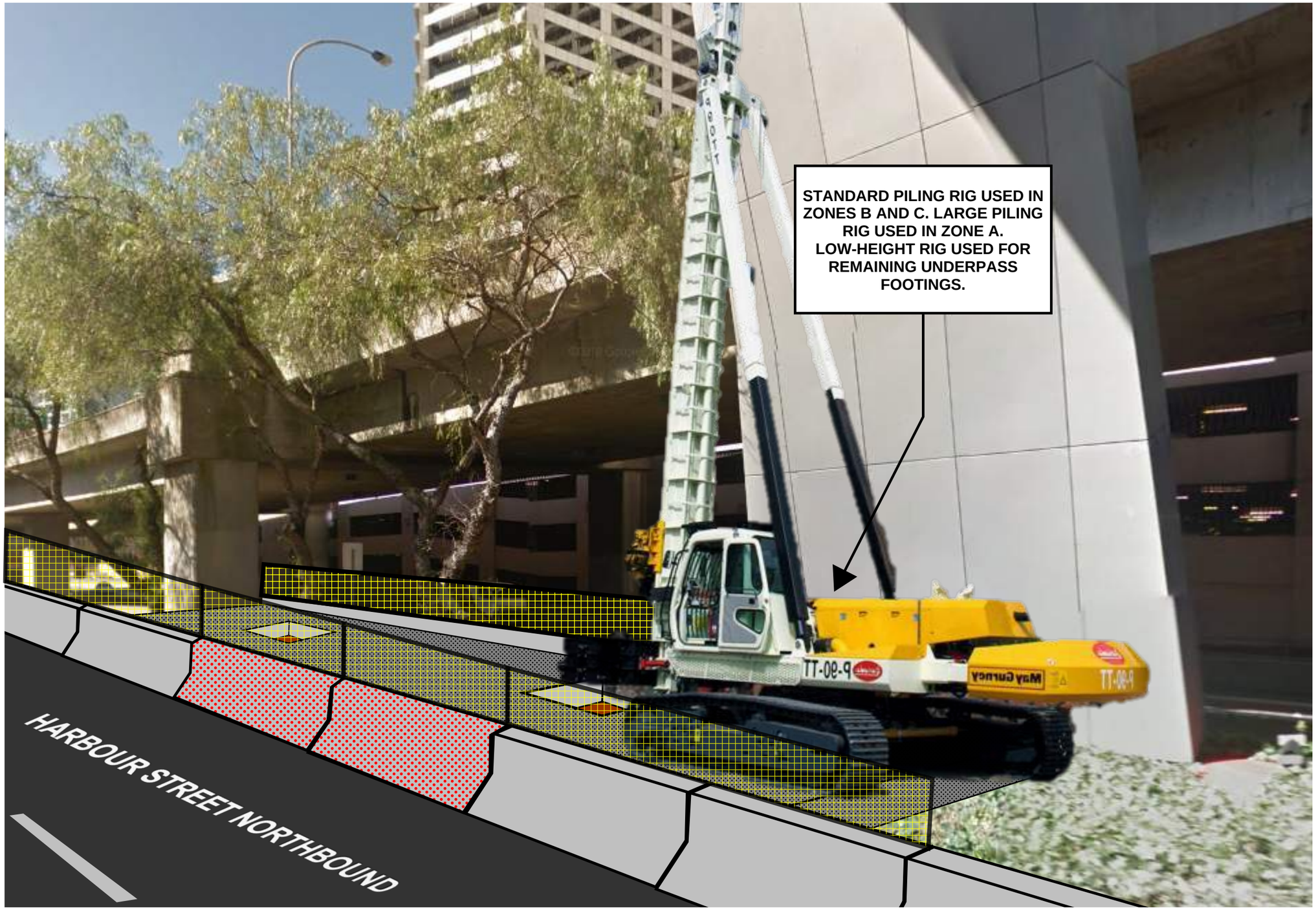
Drawing
Landbridge Foundations

Screens and Kerbs

Drawing ID
DP4-CMP-SK12

Date
7/8/2017

TYPICAL CONSTRUCTION METHODOLOGY - ZONES A, B ,D, E, F, G AND H



DP4-CMP-SK13
LANDBRIDGE FOUNDATIONS
PILING

MULTIPLEX

The GPT Group

Brookfield

AMP CAPITAL

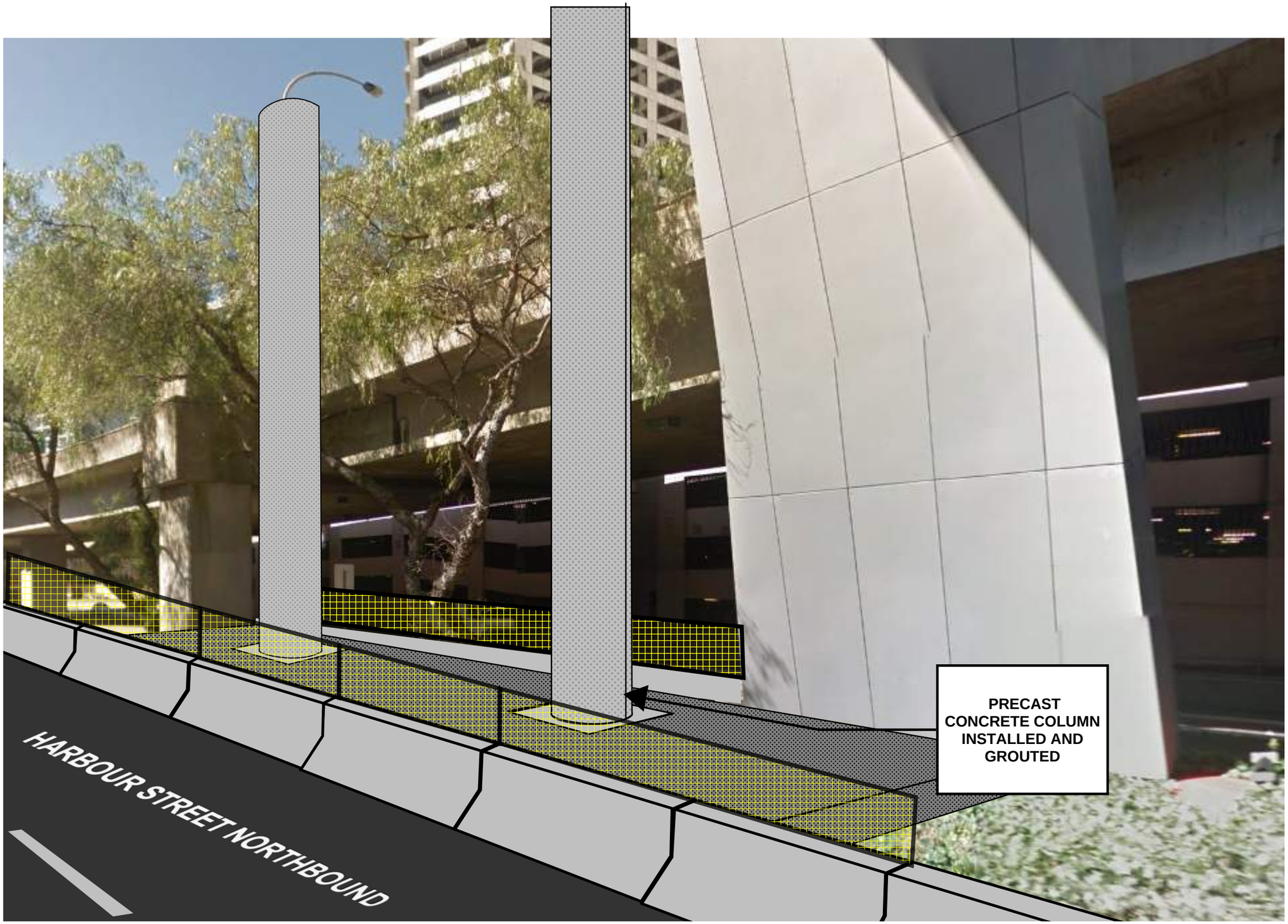
Project
Cockle Bay Park Project

Drawing
Landbridge Foundations
Piling

Drawing ID
DP4-CMP-SK13

Date
7/8/2017

TYPICAL CONSTRUCTION METHODOLOGY - ZONES A, B ,D, E, F, G AND H



DP4-CMP-SK14
LANDBRIDGE FOUNDATIONS
COLUMNS

MULTIPLEX

GPT The GPT Group

Brookfield

AMP CAPITAL

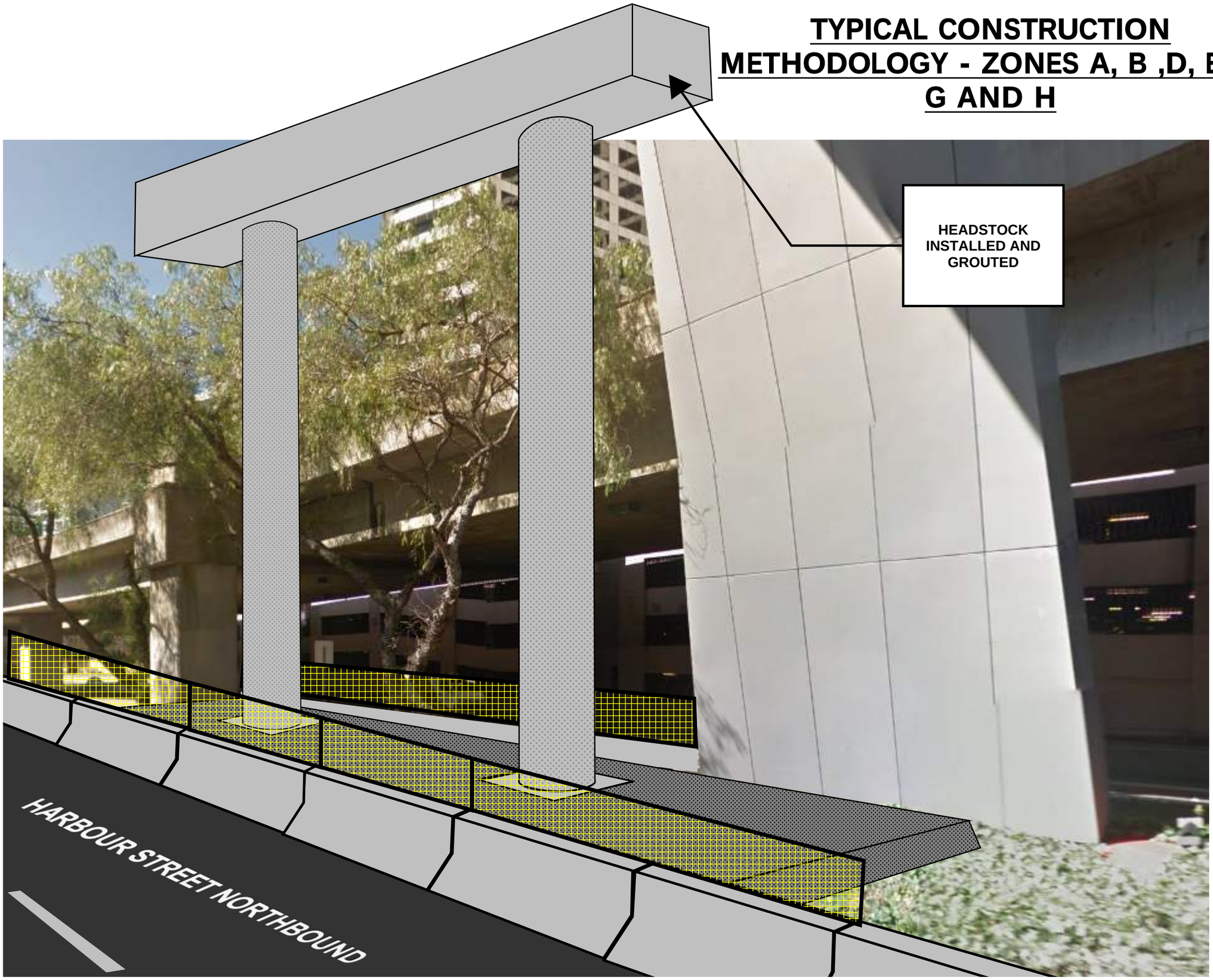
Project
Cockle Bay Park Project

Drawing
Landbridge Foundations
Columns

Drawing ID
DP4-CMP-SK14

Date
7/8/2017

TYPICAL CONSTRUCTION METHODOLOGY - ZONES A, B ,D, E, F, G AND H



DP4-CMP-SK15
LANDBRIDGE FOUNDATIONS
HEADSTOCKS

MULTIPLEX

The GPT Group

Brookfield

AMP CAPITAL

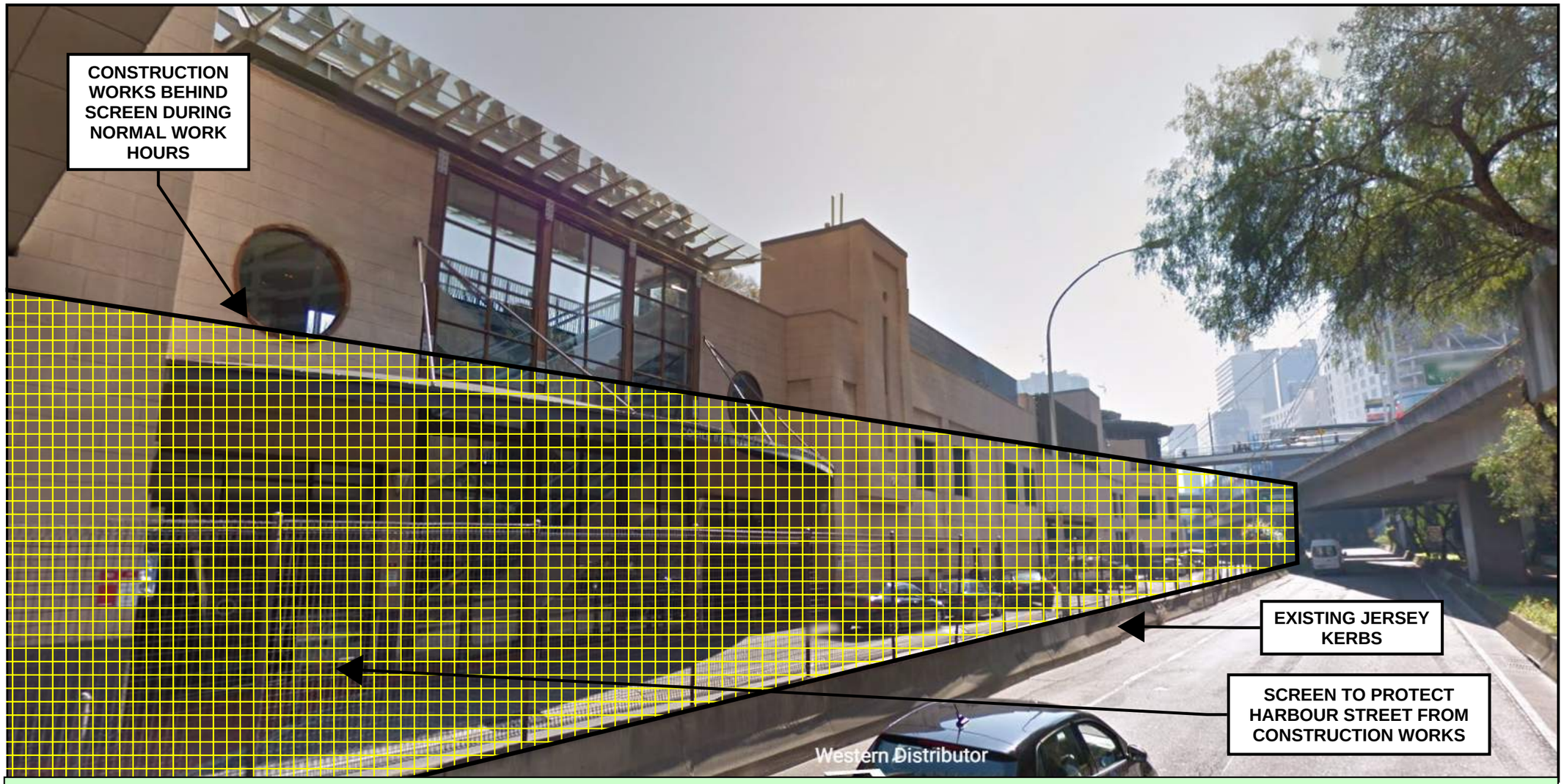
Project
Cockle Bay Park Project

Drawing
Landbridge Foundations
Headstocks

Drawing ID
DP4-CMP-SK15

Date
7/8/2017

ZONE A
TYPICAL CONSTRUCTION METHODOLOGY



CONSTRUCTION METHODOLOGY - REFER TO SKETCHES DP4-CMP-SK12 to 19 FOR PICTORIAL SEQUENCE

1. NIGHT ROAD CLOSURE TO REMOVE TREES
2. NIGHT ROAD CLOSURE TO PROVIDE ACCESS TO HARBOUR STREET FROM WHEAT ROAD BY LOCAL REMOVAL OF JERSEY KERBS
3. NIGHT ROAD CLOSURE TO ESTABLISH REMOVABLE JERSEY KERBS WITH FENCING PANELS ON HARBOUR STREET MEDIAN (SHOWN)
4. EXCAVATE
5. POUR CONCRETE BLINDING SLAB
6. INSTALL PILES
7. FRP PILE CAPS
8. FRP COLUMNS (2 X 6M RISE)
9. REMOVE COLUMN SHUTTERS

DP4-CMP-SK16
LANDBRIDGE FOUNDATIONS
ZONE A

MULTIPLEX

GPT The GPT Group

Brookfield

AMP CAPITAL

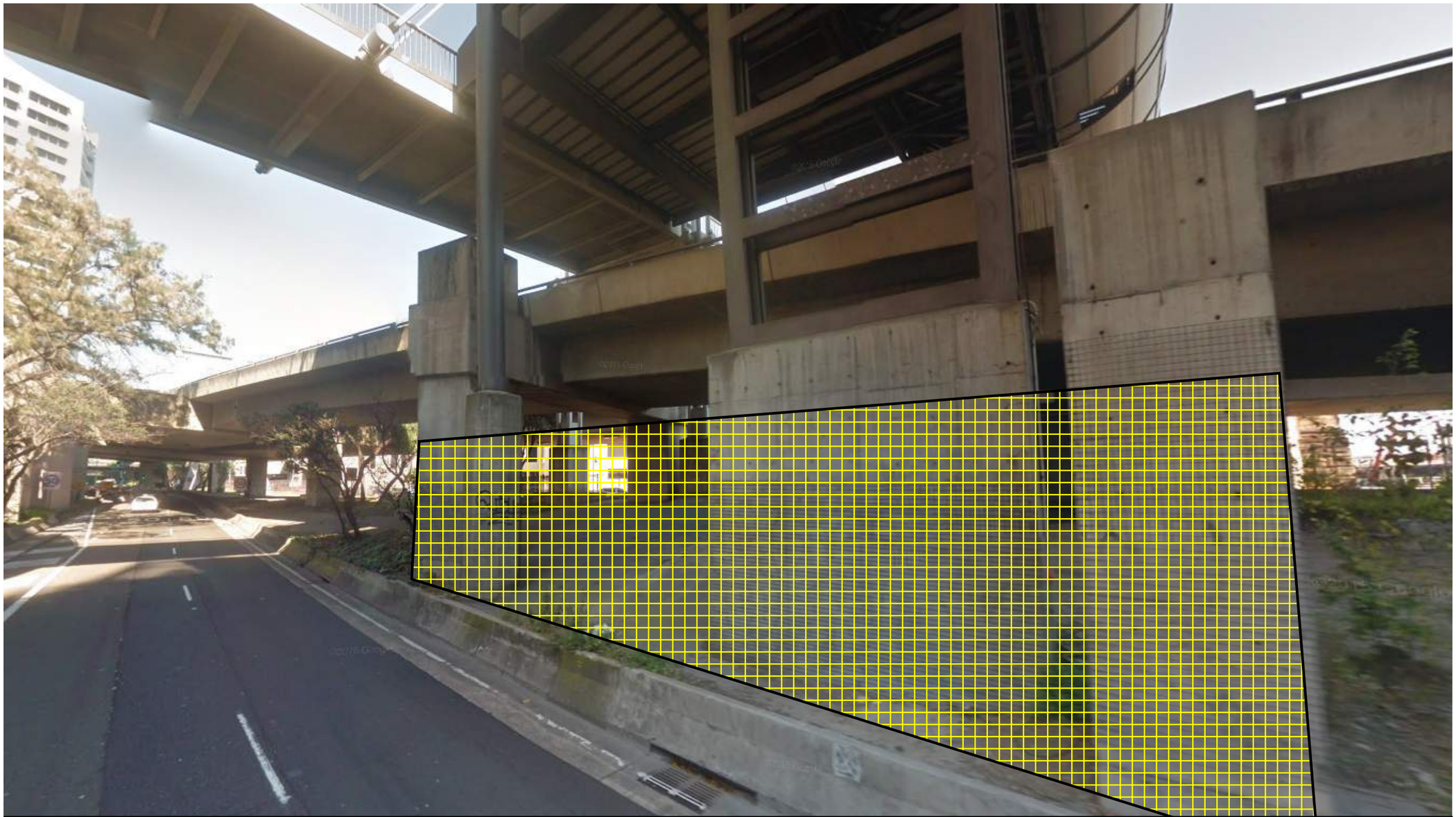
Project
Cockle Bay Park Project

Drawing
Landbridge Foundations
Zone A

Drawing ID
DP4-CMP-SK16

Date
7/8/2017

ZONE D
TYPICAL CONSTRUCTION METHODOLOGY



CONSTRUCTION METHODOLOGY - REFER TO ZONE B SKETCHES FOR PICTORIAL

1. NIGHT ROAD CLOSURE TO REMOVE TREES
2. NIGHT ROAD CLOSURE TO INSTALL SCREEN
3. NIGHT ROAD CLOSURE TO POUR BLINDING SLAB TO INFILL MEDIAN BETWEEN JERSEY KERBS
3. NIGHT ROAD CLOSURE TO INSTALL PILES
7. NIGHT ROAD CLOSURE TO FRP PILE CAPS
8. NIGHT ROAD CLOSURE TO FRP COLUMNS (2 RISES @ ~6M)
9. NIGHT ROAD CLOSURE TO INSTALL HEADSTOCKS AND GROUT CONNECTION

DP4-CMP-SK17
LANDBRIDGE FOUNDATION
ZONE D

MULTIPLEX

The GPT Group

Brookfield

AMP CAPITAL

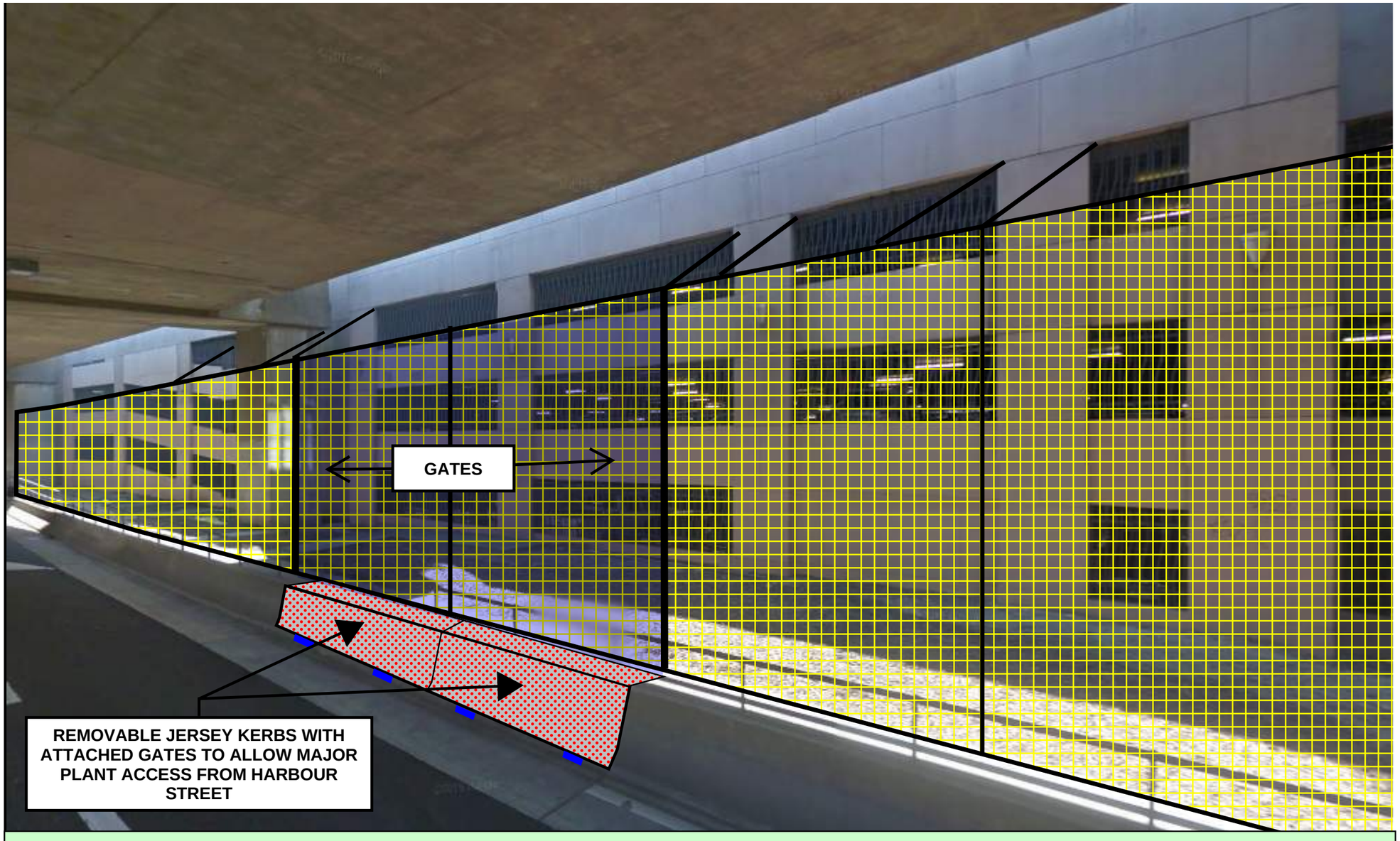
Project
Cockle Bay Park Project

Drawing
Landbridge Foundations
Zone D

Drawing ID
DP4-CMP-SK17

Date
7/8/2017

ZONE E
TYPICAL CONSTRUCTION METHODOLOGY



CONSTRUCTION METHODOLOGY - REFER TO ZONE B SKETCHES FOR PICTORIAL

1. NIGHT ROAD CLOSURE TO REMOVE TREES
2. NIGHT ROAD CLOSURE TO PROVIDE ACCESS TO HARBOUR STREET FROM SLIP STREET BY LOCAL REMOVAL OF JERSEY KERBS
3. NIGHT ROAD CLOSURE TO ESTABLISH REMOVABLE JERSEY KERBS WITH FENCING PANELS ON HARBOUR STREET MEDIAN (SHOWN)
4. NIGHT LANE CLOSURE POUR CONCRETE BLINDING SLAB
5. NIGHT LANE CLOSURE INSTALL PILES (LOW HEIGHT RIG). POTENTIAL SPOIL REMOVAL THROUGH DARLING PARK CAR PARK.
6. NIGHT LANE CLOSURE FRP PILE CAPS
7. NIGHT LANE CLOSURE TO FRP COLUMNS (2 RISES @ 6M)
8. NIGHT ROAD CLOSURE TO INSTALL PRECAST CONCRETE HEADSTOCKS AND GROUT CONNECTIONS
9. NIGHT ROAD CLOSURE TO REMOVE SCREENS AND REINSTATE KERBS

DP4-CMP-SK18
LANDBRIDGE FOUNDATION
ZONE E

MULTIPLEX

GPT The GPT Group

Brookfield

AMP CAPITAL

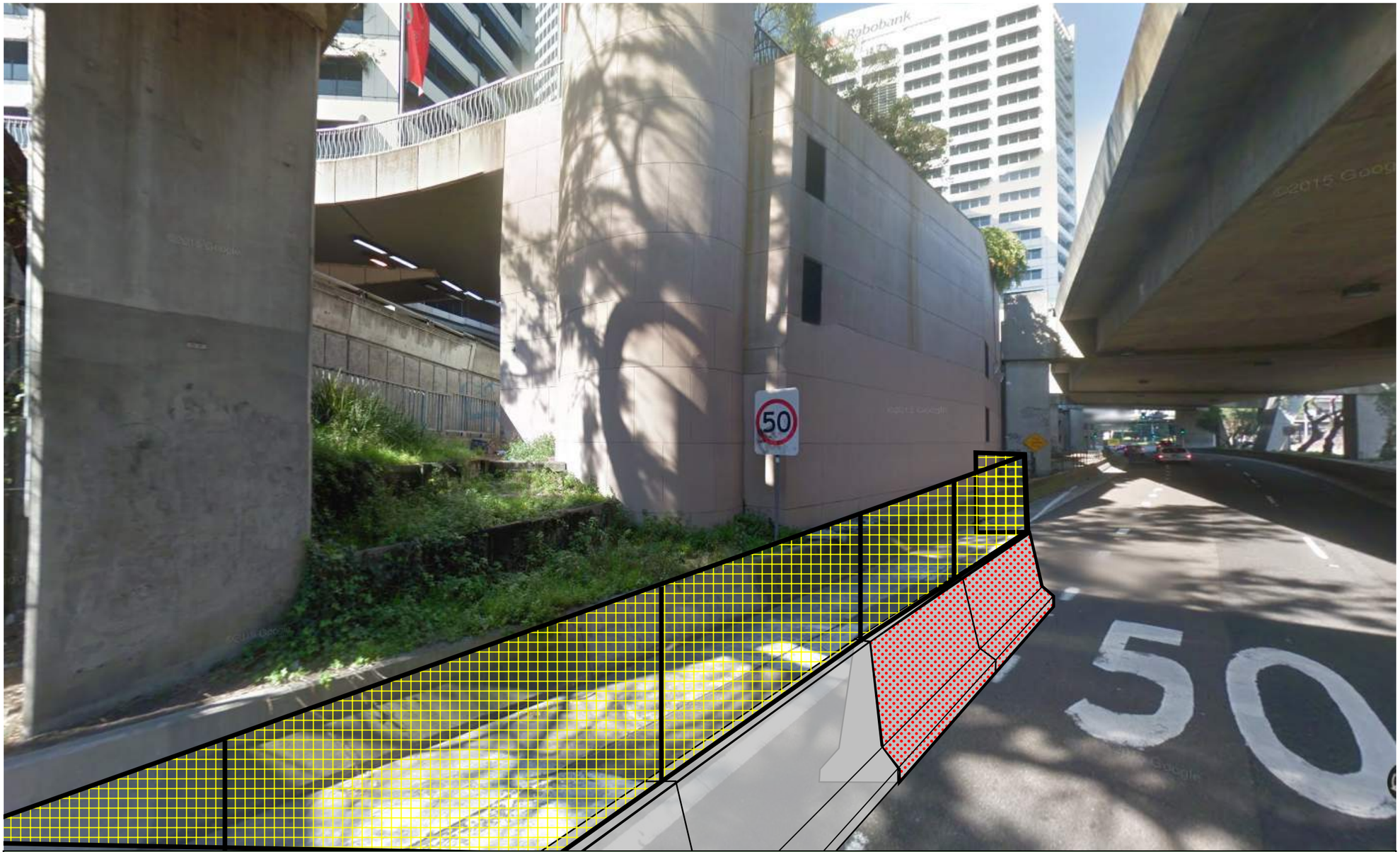
Project
Cockle Bay Park Precinct

Drawing
Landbridge Foundations Zone E

Drawing ID
DP4-CMP-SK18

Date
7/8/2017

ZONE F
TYPICAL CONSTRUCTION METHODOLOGY



CONSTRUCTION METHODOLOGY - REFER TO ZONE B SKETCHES FOR PICTORIAL

1. NIGHT ROAD CLOSURE REMOVE TREES
2. NIGHT ROAD CLOSURE TO PROVIDE ACCESS TO HARBOUR STREET FROM SLIP STREET BY LOCAL REMOVAL OF JERSEY KERBS
3. NIGHT ROAD CLOSURE TO ESTABLISH REMOVABLE JERSEY KERBS WITH FENCING PANELS ON HARBOUR STREET SOUTHBOUND (SHOWN)
4. NIGHT LANE CLOSURE TO EXCAVATE AND POUR PILING PLATFORM WHERE NECESSARY
5. NIGHT LANE CLOSURE TO INSTALL PILES
6. NIGHT LANE CLOSURE TO FRP PILE CAPS
7. NIGHT LANE CLOSURE TO FRP COLUMNS
8. NIGHT ROAD CLOSURE TO INSTALL PRECAST CONCRETE HEADSTOCKS AND GROUT CONNECTION
9. NIGHT ROAD CLOSURE TO REMOVE JERSEY KERBS AND SCREENS

DP4-CMP-SK19
LANDBRIDGE FOUNDATIONS
ZONE F

MULTIPLEX

The GPT Group

Brookfield

AMP CAPITAL

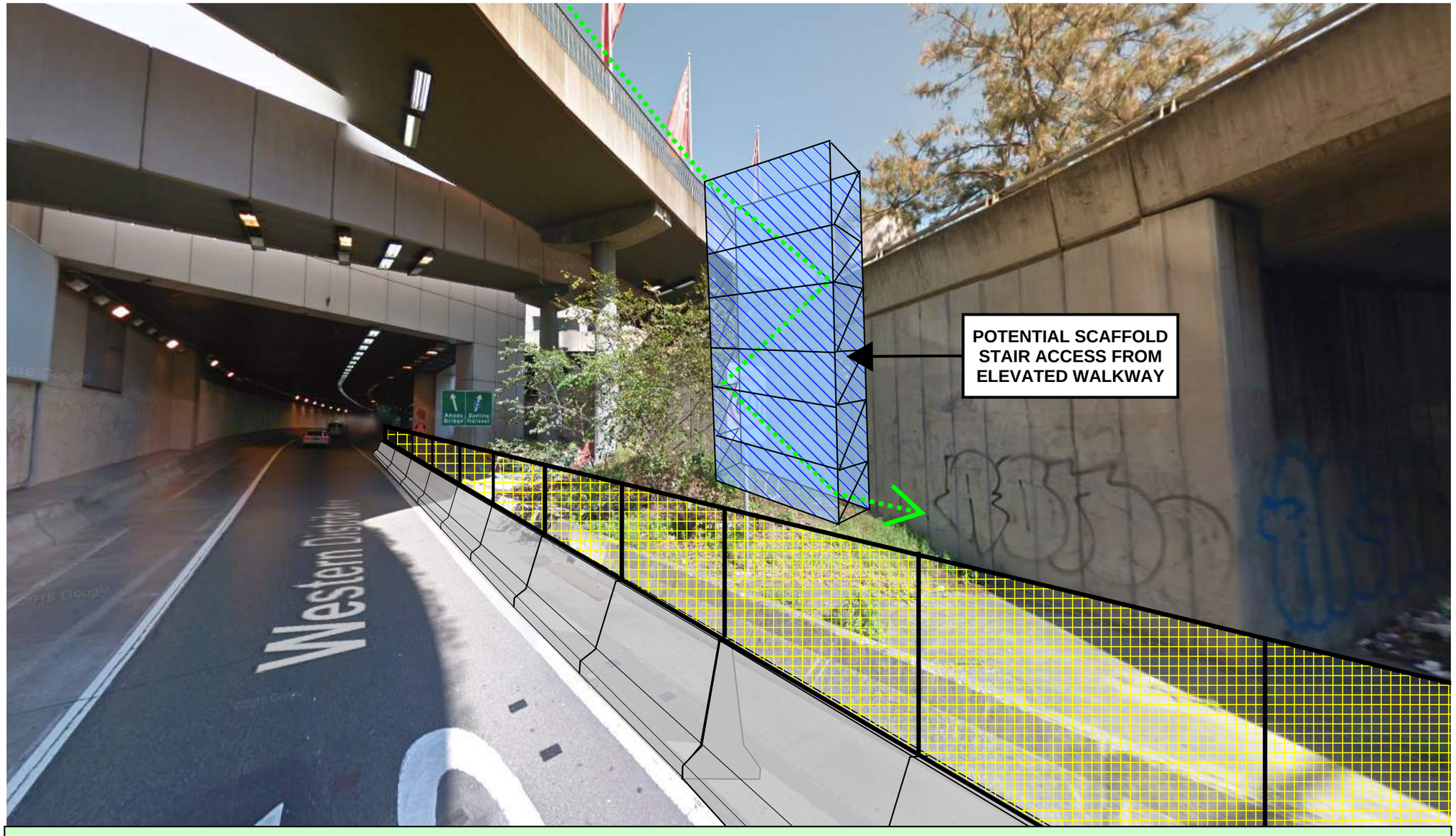
Project
Cockle Bay Park Project

Drawing
Landbridge Foundations
Zone F

Drawing ID
DP4-CMP-SK19

Date
7/8/2017

ZONE G
TYPICAL CONSTRUCTION METHODOLOGY



CONSTRUCTION METHODOLOGY - REFER TO ZONE B SKETCHES FOR PICTORIAL

1. NIGHT ROAD CLOSURE TO REMOVE TREES
2. NIGHT ROAD CLOSURE TO PROVIDE ACCESS TO WESTERN DISTRIBUTOR FROM SLIP STREET BY LOCAL REMOVAL OF JERSEY KERBS
3. NIGHT ROAD CLOSURE TO ESTABLISH REMOVABLE JERSEY KERBS WITH FENCING PANELS ON WESTERN DISTRIBUTOR (SHOWN)
4. NIGHT ROAD CLOSURE FOR EXCAVATION
5. NIGHT ROAD CLOSURE TO POUR CONCRETE BLINDING SLAB FOR PILING PLATFORM
6. NIGHT ROAD CLOSURE TO INSTALL PILES
7. NIGHT ROAD CLOSURE TO FRP PILE CAPS
8. NIGHT ROAD CLOSURE TO FRP COLUMNS (2 X 6M RISE)
9. NIGHT ROAD CLOSURE TO INSTALL PRECAST CONCRETE HEADSTOCKS AND GROUT CONNECTIONS
10. NIGHT ROAD CLOSURE TO REMOVE SCREENS AND JERSEY KERBS. RETUN KERBS TO PREVIOUS ARRANGEMENT.

DP4-CMP-SK20
LANDBRIDGE FOUNDATION
ZONE G

MULTIPLEX

GPT The GPT Group

Brookfield

AMPCAPITAL

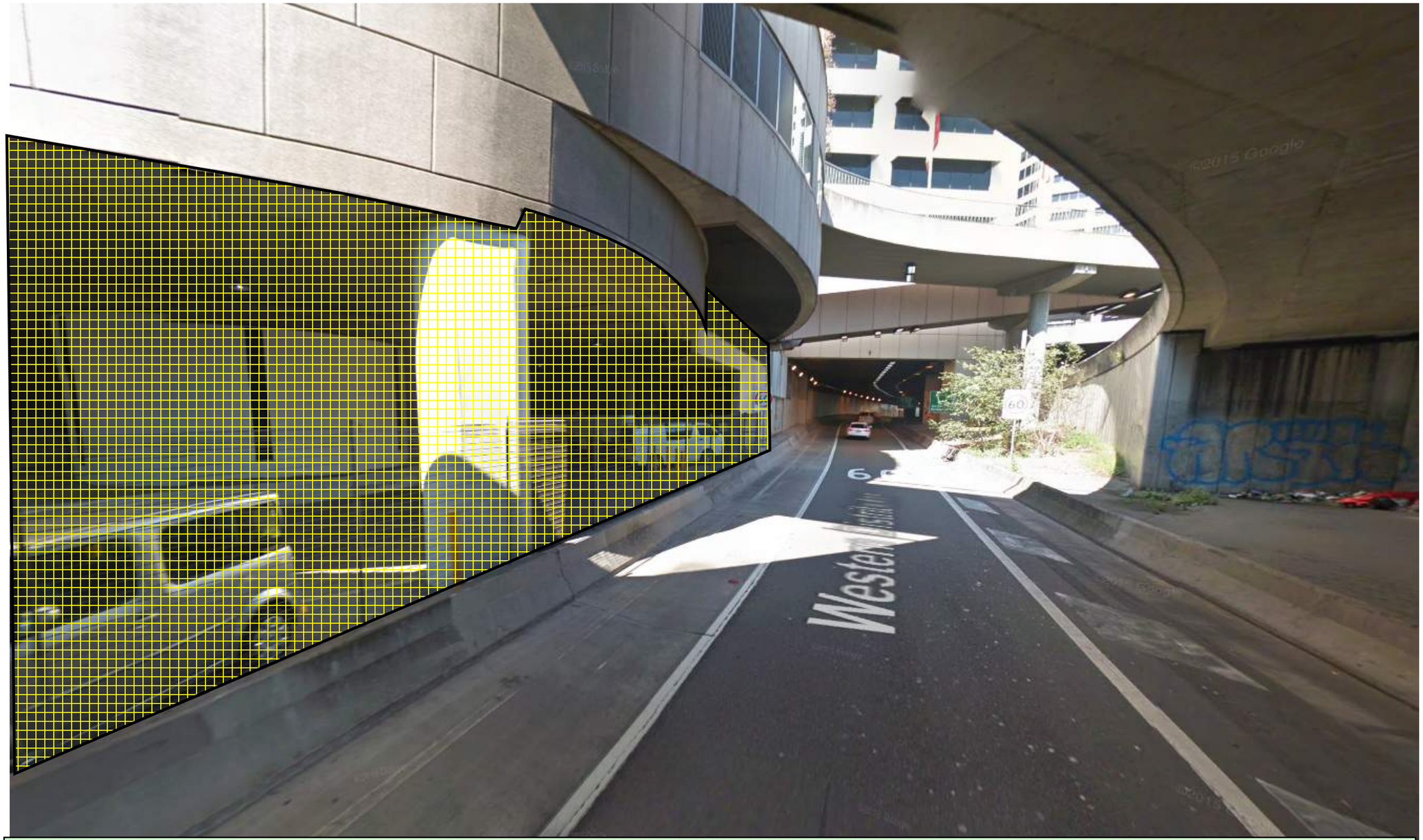
Project
Cockle Bay Park Project

Drawing
Landbridge Foundations Zone G

Drawing ID
DP4-CMP-SK20

Date
7/8/2017

ZONE H
TYPICAL CONSTRUCTION METHODOLOGY



CONSTRUCTION METHODOLOGY - ZONE H

1. NIGHT ROAD CLOSURE TO INSTALL SCREEN
2. ALL WORKS TO BE CARRIED OUT WITHOUT IMPACT TO RMS ROADS
3. INTERNAL WORKS TO BE COORDINATED WITH EXISTING PROPERTY OWNERS
4. INSTALL PILES
5. FRP PILE CAPS
6. NIGHT ROAD CLOSURE - FRP COLUMNS (2 RISES @ 6M) (DEPENDENT ON DEMOLITION OF STRUCTURE ABOVE)
7. NIGHT ROAD CLOSURE -INSTALL PRECAST CONCRETE HEADSTOCKS AND GROUT CONNECTIONS
8. NIGHT ROAD CLOSURE REMOVE SCREEN

DP4-CMP-SK21
LANDBRIDGE FOUNDATIONS
ZONE H

MULTIPLEX

GPT The GPT Group

Brookfield

AMP CAPITAL

Project
Cockle Bay Park Project

Drawing
Landbridge Foundations
Zone H

Drawing ID
DP4-CMP-SK21

Date
7/8/2017

DP4-CMP-SK22

LANDBRIDGE CRANE SETUP
AND PRECAST INSTALLATION

MULTIPLEX

GPT The GPT Group

Brookfield

AMP CAPITAL

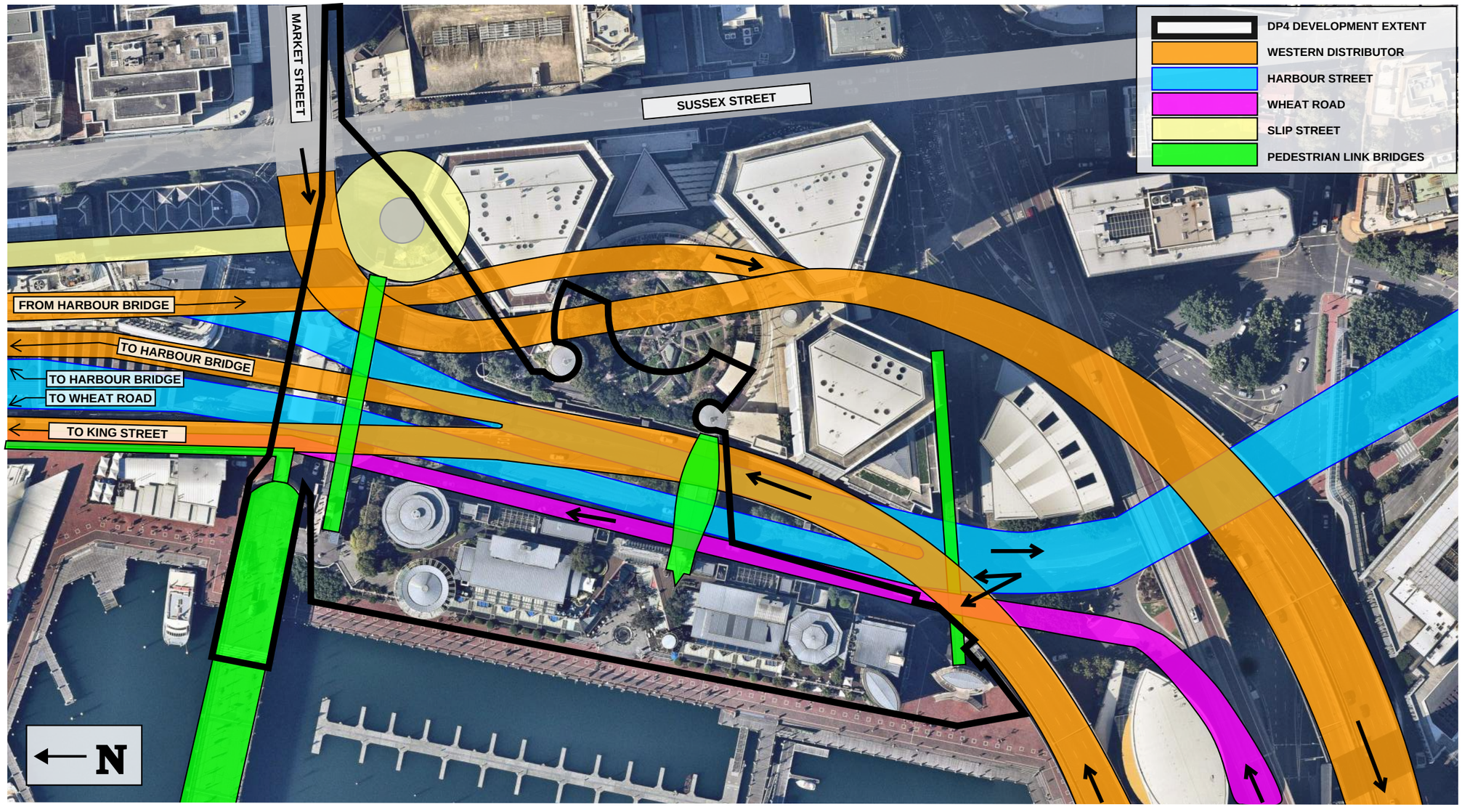
Project
Cockle Bay Park Project

Drawing
Landbridge Crane Setup
and Precast Installation

Drawing ID
DP4-CMP-SK22

Date
01/8/2017

AREA ACCESS PLAN



DP4-CMP-SK23
AREA ACCESS

MULTIPLEX

GPT The GPT Group

Brookfield

AMP CAPITAL

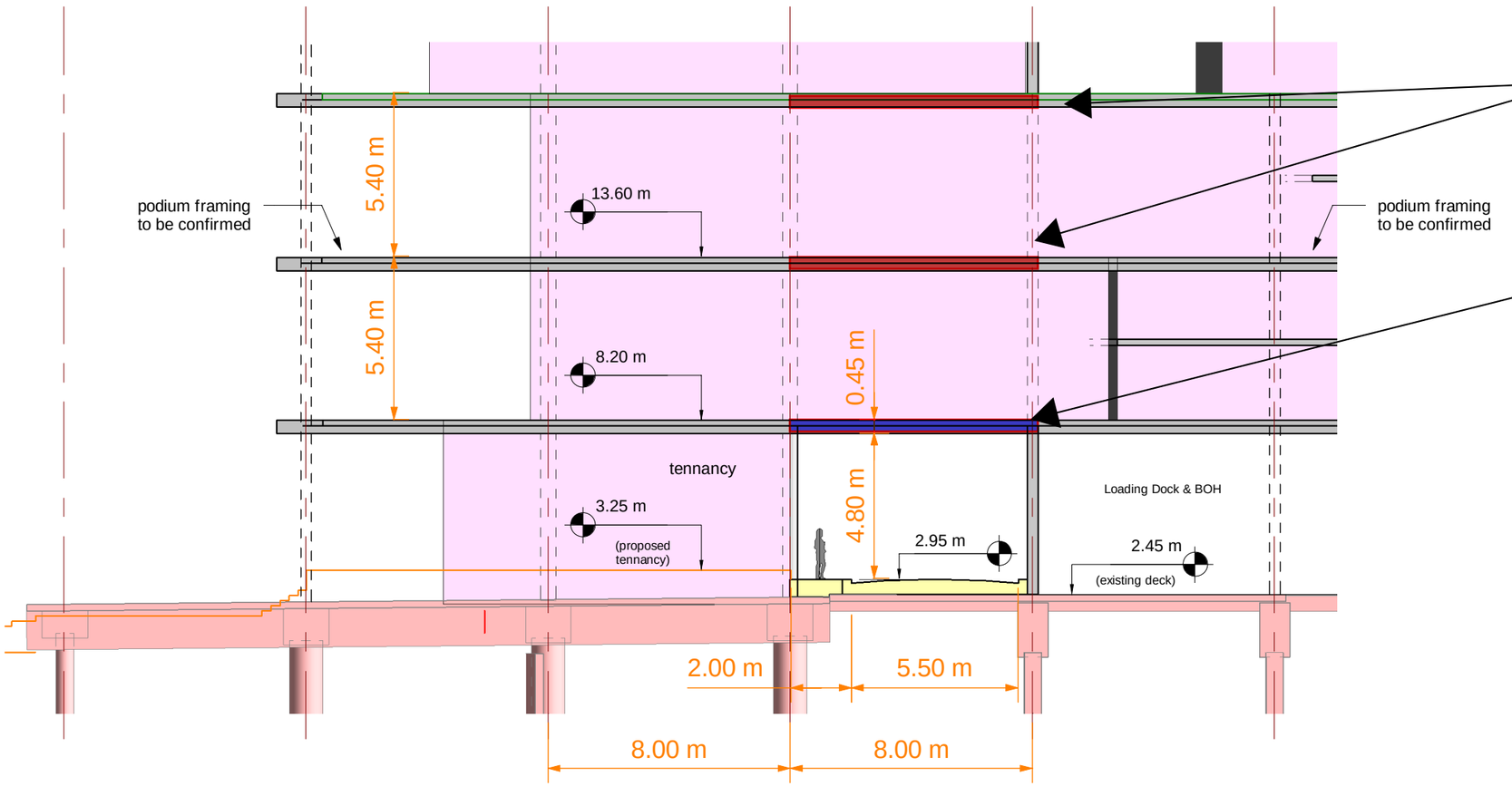
Project
Cockle Bay Park Project

Drawing
Area Access

Drawing ID
DP4-CMP-SK23

Date
7/8/2017

Precast Infills Over Temporary Access Road



DP4-CMP-SK24
PRECAST INFILLS OVER TEMPORARY ACCESS ROAD

MULTIPLEX

GPT The GPT Group

Brookfield

AMP CAPITAL

Project
Cockle Bay Park Project

Drawing
Precast Infills Over Temporary Access Road

Drawing ID
DP4-CMP-SK24

Date
01/8/2017