DPT & DPPT OPERATOR PTY LTD

TRAFFIC REPORT FOR REVISED PROPOSED DEVELOPMENT OF COCKLE BAY PARK, DARLING HARBOUR

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ATTACHMENTS

1. INTRODUCTION

1.1 Colston Budd Rogers and Kafes Pty Ltd has been commissioned by DPT & DPPT Operator Pty Ltd to prepare a report examining the traffic implications of the proposed revised development Cockle Bay Park, Darling Harbour.

1.2 Cockle Bay Park is located on the eastern side of Darling Harbour, as shown on Figure 1. Access to the site is available from Harbour Street via Wheat Road. Wheat Road passes through the site in a northerly direction and Harbour Street is located adjacent to the eastern boundary of the site. The site is currently occupied by a mix of commercial, retail and recreational uses.

1.3 The proposed revised redevelopment will include some 75,000m^2 of commercial area, some 14,000m^2 of retail area (including food, beverage and retail shops) and some 15,000m^2 of publicly accessible open space. The proposed redevelopment will include an extension of the development over the northbound and southbound carriageways of the Western Distributor and the potential diversion of Wheat Road through the site.

1.4 The revised scheme replaces a previous larger scheme for the site (110,000m^2 of commercial area, 25,000m^2 of retail area and some 12,000m^2 of publicly accessible open space). We prepared a traffic report for the previous scheme (Traffic Report for Proposed Redevelopment of Cockle Bay Wharf, Darling Harbour – October 2016).

1.5 The report considers the traffic matters raised in the SEARS issued by NSW Planning and Environment for the redevelopment of Cockle Bay issued on 23 June 2016 (Section 8 Transport and Accessibility – construction and operation) and matters raised by RMS/TfNSW with regards to the previous scheme (as set out in their submissions of 10 march and 23 March 2017 respectively. These matters are summarised below:

- existing traffic conditions;
- estimated traffic generation of the proposed development;
- impact of the proposed development on the operation of the surrounding road network;
- provision of appropriate on-site parking;
- measures to encourage travel by means other the private car;
- service vehicle requirements;
- site access requirements;
- interaction with IMAX Theatre (Ribbon) Redevelopment; and
- construction impacts.

1.6 The traffic effects of the proposed revised redevelopment of Cockle Bay Park are set out through the following chapters:

- Chapter 2: describing existing conditions; and
- Chapter 3: assessing the implications of the proposed revised redevelopment.

1.7 Please note that all plans, diagrams, images and graphics within this report and the supporting documentation (excluding the amended Concept Proposal Envelope

Plans prepared by FJMT Pty Ltd) are indicative only and have been included to communicate the intent of amended Concept Proposal, including representative building shapes, forms, locations, layouts and relationships. It is proposed that these representations, together with acceptance of building envelopes and massing, 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.

2. EXISTING CONDITIONS

Site Location and Road Network

2.1 Cockle Bay Park is located on the eastern side of Darling Harbour, as shown on Figure 1. Access to the site is available from Harbour Street via Wheat Road. Wheat Road passes through the site in a northerly direction and Harbour Street is located adjacent to the eastern boundary of the site. The site is currently occupied by a mix of commercial, retail and recreational uses (some 8,200m^2). Surrounding land use is predominantly commercial, recreational and retail uses. The IMAX theatre was located to the south of the site and has been approved for a new mixed use development (The Ribbon development comprising two levels of retail/mixed use space, 23 level hotel/serviced apartments and new IMAX theatre). Construction of the Ribbon development is currently underway and expected to be completed in 2019.

2.2 The roads adjacent to the site include Harbour Street, Wheat Road, Blackwattle Place and Shelly Street. Harbour Street is located east of the site and runs in a north south direction connecting the southern part of Sydney CBD with the Harbour Bridge (connecting to the Western Distributor to the north of the site). Adjacent to the site it is a divided road providing two to three lanes in each direction.

2.3 Wheat Road runs north south within the site connecting Harbour Street in the south with Shelley Street in the north. It is one way northbound with a single lane in a five metre carriageway. Wheat Road provides access to the IMAX site, Cockle Bay Wharf and to the King Street Wharf precinct which is north of the site

and has three connections from Harbour Street (all left turns). These are to the IMAX site, at the southern end of Cockle Bay Wharf and just north of the site. Wheat Road provides service access to development fronting Cockle Bay. Along the frontage of the site, Wheat Road provides some kerb side parking for set down/pick up (2 spaces), authorised parking (12 spaces), disabled parking (6 spaces) and on-street loading (3 spaces). There is no egress from Wheat Road onto Harbour Street.

2.4 Blackwattle Place is located on the eastern side of Harbour Street and is a no through road. It functions as a service access road to Darling Park. The intersection of Blackwattle Place and Harbour Street is controlled by a traffic signal controlled t-intersection with no right turn from Blackwattle Place. Northbound traffic flow on Harbour Street is not affected by these traffic signals.

2.5 Shelley Street is the northern extension of Wheat Road passes through the King Street Wharf precinct. It provides for two way traffic and connects to Erskine Street and Sussex Street. All vehicles departing Cockle Bay Wharf are required to exit via Shelley Street.

Traffic Flows

2.6 Weekday morning and afternoon peak period traffic counts have been undertaken along Wheat Road and Harbour Street in 2016 (while the IMAX was still open) at the following locations:

- Harbour Street/Wheat Road (IMAX access);
- Harbour Street/Wheat Road (Cockle Bay Wharf access);
- Harbour Street/Wheat Road (King Street Wharf access); and

- Harbour Street/Blackwattle Place.

2.7 The results of the surveys are shown in Figures 2 and 3 and summarised in Table 2.1.

Table 2.1: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows

Road	Weekday Morning	Weekday Afternoon
Harbour Street		
– north King Street Wharf Access	1790	2350
– north of Cockle Bay Wharf Access	2520	2575
– north of Imax Access	2575	2645
Wheat Road		
– north King Street Wharf Access	790	340
– north of Cockle Bay Wharf Access	65	130
– north of Imax Access	10	60
Blackwattle Place		
– east of Harbour Street	15	15

2.8 Table 2.1 shows that:

- Harbour Street carried traffic flows of some 1,800 to 2,600 vehicles per hour two-way during the peak periods;

- Wheat Road carried traffic flows of some 10 to 790 vehicles per hour two-way during the peak periods. Traffic flows were highest in the northern section of Wheat Road; and

- Blackwattle Place carried low traffic flows of some 15 vehicles per hour two-way during the peak periods.

2.9 In addition to the traffic counts, observations were made of queuing on Harbour Street (in both directions) in the vicinity of Blackwattle Place during the weekday

morning and afternoon peak periods. The observations were made over three days in August/September 2016 between 7.00am and 9.30am in the morning and 3.30pm and 6.30pm in the afternoon. The results are summarised below.

- in the weekday morning survey period there was no queuing northbound on Harbour Street through the intersection with Blackwattle Place;
- in the weekday afternoon survey period there were three occasions when queuing northbound on Harbour Street extend to the intersection with Blackwattle Place. This represented 0.2% of the survey period.
- in the weekday morning survey period there were 40 occasions when queuing southbound on Harbour Street extend to the intersection with Blackwattle Place. This represented 9% of the survey period; and
- in the weekday afternoon survey period there were eight occasions when queuing southbound on Harbour Street extend to the intersection with Blackwattle Place. This represented 1.5% of the survey period

2.10 When queuing on Harbour Street did extend to Blackwattle Place it was noted that:

- on the three occasions the northbound queue extended to Blackwattle Place the queue lasted less than a minute within a five minute period; and
- the majority of the time (65%) the southbound queue extended to Blackwattle Place the queue lasted than a minute within a five minute period. The maximum time was some two minutes.

2.11 Thus in summary the observations found that:

- there is effectively no queuing northbound on Harbour Street back to

Blackwattle Place; and

- for the majority of the time there is no queuing southbound on Harbour Street to Blackwattle Place. The occasional queuing that does occur (mainly in the morning peak period), is of a short duration.

Intersection Operations

2.12 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections have been analysed using the SIDRA computer program. SIDRA analyses intersections controlled by traffic signals, roundabouts and signs.

2.13 SIDRA provides a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode.
>70	=	"F"	Unsatisfactory and requires additional capacity

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode

2.14 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.15 The SIDRA analysis found that the signalized intersection of Harbour Street and Blackwattle Place currently operates with average delays of less than 15 seconds per vehicle in the peak periods. This represents level of service A/B a good level of service. Observations noted that due to the low traffic flows in Blackwattle Place the traffic signals were only activated occasionally and that the green time allocated to turning to/from Blackwattle Place was a minimum.

Public Transport

2.16 The site is located close to major public transport routes and nodes within the CBD, as shown on Figure 4. Wynyard and Town Hall railway stations are within some 5 to 10 minutes walking distance. These are major stations on the Cityrail network and provide two of the major stops within the CBD. All suburban rail services to and through the City stop at one or both of these stations.

2.17 Rail services operate on the Airport and East Hills Line, Bankstown Line, Eastern Suburbs and Illawarra Line, Inner West Line, North Shore and Western Line, Northern Line and Southern Line. The proposed Sydney metro rail link (connecting Chatswood to Bankstown via the CBD and Sydenham) is currently in the early stages of construction with an estimated completion date of 2024. When completed this will significantly increase the capacity of the rail network to/from the CBD.

2.18 Numerous bus services operate along many of the streets within the vicinity of the site, with major bus facilities located at Wynyard Park and Queen Victoria Building bus terminus. Bus services provide links to areas north, east, inner west and south. A number of services also operate along Market Street, King Street, Clarence Street and York Street.

2.19 The CBD light rail is currently under construction along George Street to the east of the site. This will connect the CBD to Sydney's eastern suburbs through Surry Hills and Randwick further improving public transport access to the CBD. The CBD light rail will be within some 500 metres of the site. The existing inner west light rail is located to the west and south of the site with the nearest stop

(convention centre) located 400 metres away on the western side of Darling Harbour.

2.20 Thus in summary the site is well serviced by existing and future public transport services.

Cycling

2.21 The City of Sydney bicycle network, as shown on Figure 5, includes a mix of on-road cycleways and shared cycle routes. In the vicinity of the site these routes include Sussex Street, King Street and Pyrmont Bridge to the north, and Kent Street to the east of the site. An off road shared path travels north-south through Darling Harbour connecting Pyrmont Bridge Road with Union Street and Liverpool Street. It is understood that TfNSW is proposing to extend the Western Distributor Cycleway to King Street. Thus the site is readily accessible to cyclists.

Pedestrians

2.22 The site is located adjacent to Darling Harbour which has existing pedestrian connections to the surrounding area as shown in Figure 6. These include:

- pedestrian overpass located immediately south of the site. This provides direct access to town hall station via Druitt Street;
- pedestrian overpass connecting Cockle Bay Wharf with Darling Park and Sussex Street/Market Street;
- Druitt Street pedestrian bridge located south of the site;

- At grade pedestrian crossings at the intersection of Bathurst Street and Harbour Street;
- Pyrmont Bridge, located north of the site connection the CBD and Pyrmont via Darling Harbour;
- Pedestrian paths around Darling Harbour including along the western frontage of the site; and
- At grade crossings and pedestrian overpass at the intersection of Market Street and Sussex Street.

3. IMPLICATIONS OF REVISED PROPOSED DEVELOPMENT

3.1 The amended concept proposal seeks a maximum GFA of 75,000m^2 of commercial area, 14,000m^2 of retail area (including food, beverage and retail shops) and some 15,000m^2 of publicly accessible open space. Parking for some up to 150 cars will be provided. The proposed redevelopment will include an extension of the development over the northbound and southbound carriageways of the Western Distributor and the closure of Wheat Road through the site. This assessment has been based on the southern connection of Wheat Road to Harbour Street being left turn out.

3.2 This chapter assesses the traffic implications of the amended concept proposal through the following sections:

- public transport;
- pedestrians and cyclists;
- travel access plan;
- parking provision;
- access, servicing and internal layout;
- traffic generation and effects;
- interaction with Ribbon development;
- construction traffic management;
- response to matters raised by RMS /TfNSW; and
- summary.

Public Transport

3.2 As previously discussed, the site is well located to existing and future public transport services in the area. It is located within close walking distance to Wynyard and Town Hall railway stations. All suburban rail services to and through the city stop at one or both of these stations. The site is also located close to existing and future light rail services.

3.3 Bus services from major bus facilities located at Wynyard Park and Queen Victoria Building also link the site to areas to the north, east, inner west and south. A number of services also operate along Market Street, King Street, Clarence Street and York Street.

3.4 The site provides opportunities to for people to travel to the site by means other than car. Thus the proposed development is consistent with government objectives and the planning principles of:

(a) improving accessibility to employment and services by walking, cycling, and public transport;

(b) improving the choice of transport and reducing dependence solely on cars for travel purposes;

(c) moderating growth in the demand for travel and the distances travelled, especially by car; and

(d) supporting the efficient and viable operation of public transport services.

3.5 Provision will be made within the site for the set down/pick up of people including by taxis (at the northern end of the site) and coaches (at the southern end of the site). Further information on these aspects is set out in the section on access and internal layout.

Pedestrians and Cyclists

3.6 As noted in Chapter 2 the subject site is located in an area serviced by good pedestrian and cyclist networks. The proposed development will improve pedestrian/cyclist access by reconnecting the CBD with Darling Harbour via Darling Park with the extension of the development over the Western Distributor. To encourage and cater for travel by cyclists, appropriate on site cycle facilities will be provided including secure and casual cycle parking and end of trip facilities (toilets, change/locker rooms and showers).

3.7 The proposed development will be designed to provide good pedestrian access to Darling Harbor and Darling Park with high standard pedestrian links promoting pedestrian travel between Sussex Street and Darling Harbour. These will be designed to integrate with the existing pedestrian infrastructure.

3.8 A separate assessment of pedestrian accessibility to the site has been undertaken by Arup (Cockle Bay Park Development Pedestrian Assessment, August 2017).

Travel Access Guide

3.9 To encourage travel modes other than private vehicle, a travel demand management approach should be adopted, through a travel access guide to meet the specific needs of the site, including visitors and employees. Once the tenants

of the proposed development are known, the specific requirements and needs of the employees/visitors will be incorporated in a work place travel plan and transport access guide to support the objectives of encouraging the use of public transport.

3.10 The principles of the work place travel plan and travel access guide will include the following:

- encourage the use of public transport, including rail services through Wynyard and Town Hall, light rail services and bus services through the CBD;
- work with public transport providers to improve services;
- encourage public transport by employees and visitors through the provision of information, maps and timetables;
- raise awareness of health benefits of walking (including maps showing walking and cycling routes, including through and adjacent to the site);
- encourage cycling by providing safe and secure bicycle parking, including the provision of lockers and change facilities;
- provide a restrictive parking provision consistent with Council's controls and the government's objective of reducing traffic generation.

3.11 The travel access guide should be developed in accordance with the principles identified by TfNSW and RMS, and distributed with marketing material for the

proposed development. The travel access guide would assist in delivering sustainable transport objectives by considering the means available for reducing dependence solely on cars for travel purposes, encouraging the use of public transport, cycling and walking and supporting the efficient and viable operation of public transport services

Parking Provision

3.12 The subject site is located on land under the control of PNSW and bounds the western edge of the CBD. For the purposes of estimating parking provision the rates set out in the City of Sydney LEP 2012 have been used. The parking rates in LEP 2012 are maximum rates and reflect Council's objective of reducing traffic and encouraging use of no-car based travel. For the proposed development the following LEP 2012 rates apply:

M = (G x A)/ (50x T) where
M = maximum number of parking spaces;
G = Gross Floor Area of retail or commercial floor space;
A = Site Area; and
T = Total Gross Floor Area of Development

3.13 The Cockle Bay Wharf site area is some 24,900m^2 with some 75,000m^2 commercial and some 14,000m^2 retail floorspace. Using the above formula the proposed development could provide a maximum of 498 parking spaces (420 commercial and 78 retail spaces with parking allocated to commercial and retail tenants). Within the northern part of the some short term set down/pick up parking (Kiss and Ride) will be provided.

3.14 The amended concept proposal seeks provision for up to 150 cars within podium parking areas. This provision is well within the maximum limit set out in LEP 2012. Appropriate disabled parking will be provided.

3.15 With regards to bicycle parking the rates in the City of Sydney DCP 2012 have been adopted. For the proposed revised redevelopment the following rates in DCP are relevant:

- commercial – 1/150m^2 employees plus 1/400m^2 visitor;
- retail – 1/200m^2 employees plus 1/300m^2 visitor; and
- open space – 1/1000m^2 employees plus 1/200m^2 visitor.

3.16 Applying these rates the revised proposed development would require the following number of bicycle spaces:

- commercial – 688 (500 employee and 188 visitor);
- retail – 117 (70 employee and 47 visitor); and
- open space – 90 (15 employee and 75 visitor).

3.17 Staff/employee bicycle parking will be located in secure locations with appropriate end of trip facilities (showers, change rooms, lockers and bathrooms). Visitor bicycle parking will distributed around the site in accessible locations.

Access, Servicing and Internal Layout

3.18 Vehicular access to the proposed revised redevelopment will be provided from Wheat Road. As part of the proposed development Wheat Road will be reconfigured (see Attachment A) and have the following configuration:

- At the southern end of the site, the existing Cockle Bay connection of Wheat Road to Harbour Street will be modified to provide left out only to Harbour Street. This will facilitate egress from the car park, the adjacent Ribbon development and the existing bus/coach set down pick up area (located at the southern end of the site);
- At the northern end of the site, a new connection from Harbour Street to Wheat Road will be provided. This connection will provide access to the northern part of the site and provide access to Wheat Road north of the site;
- At the northern end of site access to/from Wheat Road will be provided to the site (car park, loading docks and set down/pick up area). All vehicles accessing the site would do so from Harbour Street (although from the Wheat Road northern connection rather than the existing central connection). All vehicles accessing the loading docks and set down pick up area would depart via Wheat Road (north) as per the existing situation (through Shelly Street). Vehicles exiting the car park would have the option of departing the site via Wheat Road to the north or onto Harbour Street (at the southern end) and travel north onto the Harbour Bridge; and
- Wheat Road will be closed through the site with connections at the northern and southern ends of the site;

3.19 Currently the existing coach parking, set down/pick up area and car parking located on Wheat Road adjacent to the aquarium is accessed via the connection from Harbour Street to Wheat Road at the southern end of the site. Vehicles pass through the subject site to access these areas. With Wheat Road closed through the site, access to these areas will be via the new connection to Wheat Road from Harbour Street at the northern end of the site. Road adjacent to the aquarium will be via the relocated northern connection. Existing coach parking, loading

zones, set down/pick up areas and kerb side parking in the area north of Pyrmont Bridge will not be changed. Relocating the Harbour Street connection to these areas further to the north will improve accessibility to these areas as vehicles will not have to pass through the Cockle Bay site.

3.20 Off street parking will be provided within podium level parking areas for authorized users only. No public parking will be provided on site. Existing disabled and authorised parking currently located on Wheat Road would be relocated to the podium car parks. All parking areas (driveways, ramps, circulating aisles and parking bays) will be designed to comply with requirements of AS2890.1-2004 and AS2890.6-2009.

3.21 Loading for the development will be provided within a loading dock, with access off the northern end of the reconfigured Wheat Road. The dock will be designed to accommodate rigid trucks and to comply with the requirements of AS2890.2-2002 with all trucks entering and departing the docks in a forward direction. The amended concept plan shows provision for 10 loading bays within the loading dock (2 x vans, 6 x small rigid trucks and 2 x medium rigid trucks).

3.22 At the southern end of the site, the existing bus/coach set down pick up area (currently closed during the construction of the Ribbon development) will be reinstated as part of the Ribbon development. Entry to this area would be from the southern Wheat Road connection from Harbour Street (opposite the Ribbon development) as occurred prior to the closure of this area. Exit would be to Harbour Street (via the central Wheat Road connection at the southern end of the site) where buses/coaches could either continue north along Harbour Street and onto the Harbour Bridge or re-enter Wheat Road at the northern connection.

3.23 At the northern end of the site a designated set down/pick up area will be provided. This will provide seven set down/pick up spaces for cars (an increase from the existing two set down/pick up spaces). This area could also be used for mini-buses and taxis to set down/pick up, but has not been designed to accommodate coaches.

3.24 Vehicle turning paths for the car park, set down/pick up area, coach set down/pick up area and loading docks are attached to this report (Attachment B). Further details on the design of the changes to Wheat Road, car parking areas and loading docks will be provided in the Stage 2 SSDA.

Traffic Generation and Effects

3.25 Traffic generated by the proposed revised redevelopment will comprise private vehicles, taxis, coaches and service vehicles. The morning and afternoon peak hour traffic generation of the existing uses on the site are summarised below:

- some 53 vehicles per hour in the morning peak hour comprising 32 cars, 14 trucks, 3 coaches and 4 taxis; and
- some 69 vehicles per hour in the afternoon peak hour comprising 19 cars, 1 truck, 7 coaches and 42 taxis

3.26 The proposed revised redevelopment will generate additional traffic associated with increased trucks, coaches and taxis to the new development, and the new parking provided on site. The assessment of the traffic effects of the proposed revised redevelopment is based on:

- 100% increase in existing traffic generation (car, truck, coach and taxi generation) based on an approximately 70% in non-commercial area and allowance for service traffic generated by the commercial component; and
- for traffic generated by the new car parking on site, a generation rate of 0.2 vehicles per hour (two way) per space in the morning/afternoon peak hours, reflecting the low traffic generation of commercial/tenant parking within the CBD.

3.27 Based on the above, the proposed revised redevelopment would generate an additional 75 and 95 vehicles per hour (two way) in the morning and afternoon peak hours.

3.28 As part of the proposed revised redevelopment, Wheat Road will be reconfigured (see Attachment A) and be closed through the site. As discussed in the previous section on access, all ingress to the site will be via a new connection from Harbour Street to Wheat Road (at the northern end of the site). Egress from the site will be at the northern end of the site (car park, loading docks and set down pick up area) to Shelley Street (via Wheat Road north) and at the southern end of the site (car park only) to Harbour Street (left turn only). This will also provide egress from the Ribbon development. RMS has indicated support for the left turn egress onto Harbour Street (with priority control). Two further options for the configuration of the Wheat Road connection to Harbour Street at the southern end of the site have been assessed. These include provision for a right turn out onto Harbour Street (with modifications to the Blackwattle Place traffic signals to facilitate the right turn movement). This assessment is provided in Attachment C.

3.29 With a left turn only onto Harbour Street, 35% of existing and additional traffic departing the site has been assessed as turning left onto Harbour Street to access

the Harbour Bridge. Redistributed existing morning and afternoon peak hour traffic flows (including traffic from the Ribbon redevelopment) are shown on Figures 7 and 8 and summarised in Table 3.1.

Table 3.1: Existing* + Development Two-Way (Sum of Both Directions) Peak Hour Traffic Flows – Left Out onto Harbour Street

Road	**Weekday Morning**		**Weekday Afternoon**	
	Existing	With Dev	Existing	With Dev
Harbour Street				
– north Shelley Street Access	1790	+15	2350	+50
– north of Cockle Bay Wharf Access	2520	+155	2575	+255
– north of Imax Access	2575	+60	2645	+50
Wheat Road				
– north Shelly Street Access	815	+5	390	-55
– north of Cockle Bay Wharf Access	90	-75	190	-180
– north of Imax Access	35	+0	120	+0
Blackwattle Place				
– east of Harbour Street	15	15	15	15

*Existing includes IMAX development traffic

3.30 Examination of Table 3.1 reveals that with development traffic in place and a left turn exit onto Wheat Road that:

- Traffic flows on Harbour Street would increase by some 15 to 255 vehicles per hour (northbound). The biggest increase is in the section between the central and northern connections of Wheat Road to Harbour Street, as existing traffic (including from the IMAX redevelopment) is required to use this section of Harbour Street following the closure of Wheat Road through the site; and

- There would be minimal change in traffic flows on Wheat Road north and south of the site.

3.31 The effects of the proposed egress onto Harbour Street have been assessed using SIDRA. The analysis also includes traffic from the redevelopment of the IMAX site to south. The analysis found that the modified intersection of Harbour Street/Blackwattle Place/Wheat Road would operate with average delays of less than 25 seconds per vehicle in the morning and afternoon peak periods with left out only (priority control).

3.32 Provision of an egress from Wheat Road onto Harbour Street will provide direct egress from the site to the arterial road network and result in less traffic having to pass through Shelley Street and the King Street Wharf precinct located immediately north of the site.

Interaction with IMAX Theatre (Ribbon) Redevelopment

3.33 Currently the adjacent Ribbon development has ingress from Harbour Street (at the southern connection, south of Blackwattle Place) with egress via Wheat Road (through the subject site) to Shelley Street. The proposed Cockle Bay Park development will not change ingress to the Ribbon development. Egress will be modified with traffic exiting onto Harbour Street (left turn only) at the central Wheat Road connection to Harbour Street (opposite Blackwattle Place). This would allow Ribbon traffic to either travel directly north onto the Harbour Bridge or access the CBD via Shelley Street. The traffic effects of the change in egress from the Ribbon development has been assessed (in the previous section and found to be satisfactory).

Construction Traffic Management Plan

3.34 A revised preliminary construction traffic management plan has been prepared and is provided in a separate report (Principles of Construction Traffic Management for Proposed Revised Development of Cockle Bay Park, Darling Harbour – August 2017). The revised CTMP (submitted as a separate report) includes responses to the matters raised by TfNSW and RMS.

Response to Matters Raised by RMS/TfNSW

3.35 In letters dated 10 March 2017 and 23 March 2017, RMS and TfNSW have raised a number of traffic matters. These are summarised below:

(a) The proposed modifications to the traffic signals at Blackwattle Place/Harbour Street are not supported due to the impact on through traffic on Harbour Street;
(b) Provide details of distribution of additional trips generated by the proposed development.
(c) Assessment of queuing at the Wheat Road approach to the intersection with Harbour Street;
(d) Provide electronic copies of intersection modeling;
(e) Potential conflicts with traffic movements on the Wheat Road at the intersection of Wheat Road/Harbour Street;
(f) Provide vehicle turn paths of largest vehicles accessing the site;
(g) Details of taxi ranks and loading zones on Wheat Road;
(h) Provide further details on how pedestrian accessibility will be improved to/from Cockle Bay;
(i) Interaction with the IMAX Theatre (Ribbon) Redevelopment; and

(j) Construction traffic management.

3.36 Our responses to each of these matters are set out in the following sections.

3.37 With respect to (a), a number of meetings have been held with RMS to discuss the proposed modifications to Wheat Road. RMS has advised that in general it has no objections to the proposed modifications to Wheat Road, including the relocation of the provision of a new connection to Wheat Road from Harbour Street at the northern end of the site, closure of Wheat Road through the site and provision of left turn exit onto Harbour Street (priority control) opposite Blackwattle Place. The traffic assessment has been based on Wheat Road being closed through the site and left out access to Harbour Street (priority controlled) located opposite Blackwattle Place, and found to be satisfactory. A traffic assessment of options to modify the traffic signals at Blackwattle Place to allow right turn egress from Wheat Road is provided in Attachment C.

3.38 With respect to (b), existing traffic and traffic from the adjacent Ribbon development has been redistributed to take into account the closure of Wheat Road through the site and the change in access at the central Wheat Road connection to Harbour Street (at the southern end of the site) from left in to left out. As per the existing situation, all traffic entering the site must do so from Harbour Street (although it would now use the northern connection rather than the central or southern connections). Egress would be either to Shelley Street or onto Harbour Street. Some 35% of traffic that accesses Harbour Street has been assumed to continue north onto the Harbour Bridge with the balance travelling to Shelley Street via Wheat Road (northern connection).

3.39 With respect to (c), the traffic modeling has found a 95% back of queue on Wheat Road approach to the intersection with Harbour Street (left turn out) of some two vehicles in the weekday morning and afternoon peak hours.

3.40 With respect to (d), electronic copies of the SIDRA modeling will be provided to RMS.

3.41 With respect to (e), the potential conflicts on Wheat Road at the intersection of Wheat Road and Harbour Street have been addressed in the modified design with egress only to Wheat Road. With this arrangement there is only a merge between traffic exiting the podium car park and traffic exiting the Ribbon development.

3.42 With respect to (f), vehicle turn paths are provided in Attachment C.

3.43 With respect to (g), the proposed revised redevelopment provides the following:

- 125 parking spaces within podium levels. This will include displaced disabled and authorized parking currently provided on Wheat Road;
- A set down/pick up area (seven spaces) at the northern end of the site (an increase of five spaces);
- The coach/bus set down/pick zone at the southern end of the site will be reinstated following completion of the Ribbon development; and
- Separate service area within the development (10 loading bays).

3.44 With respect to (h), pedestrian access is addressed in the separate report prepared by Arup.

3.45 With respect to (i), interaction with the IMAX (Ribbon) redevelopment has been addressed.

3.46 With respect to (j), the matters raised by RMS/TfNSW have been addressed in the revised preliminary construction traffic management plan. It is noted that TfNSW has suggested the proposed development be conditioned to prepare a CTMP in consultation with the CBD Coordination Office and TfNSW. TfNSW has identified the matters to be addressed in the CTMP.

Summary

3.47 In summary, the main points relating to the traffic implications of amended concept proposal are as follows:

i) the revised proposed development is close to existing public transport services and is consistent with government policy objectives to reduce private car travel and encourage public transport use;

ii) The revised proposed development will result in improved pedestrian connectivity between Darling Harbour and the CBD;

iii) a travel access guide will be implemented for the site;

iv) on-site car parking will be provided within the maximum allowable by LEP 2012 for authorised users only (no public parking);

v) on-site bicycle parking will be provided in accordance with the requirements of DCP 2012;

vi) access arrangements, internal circulation, and servicing will be provided in accordance with AS2890.1-2004, AS2890.2-2002 and AS2890.6-2009;

vii) the road network will be able to cater for the additional traffic from the proposed revised redevelopment;

viii) a left turn egress onto Harbour Street from Wheat Road at Blackwattle Place would be satisfactory with minimal impact on Harbour Street;

ix) options for right turn egress from Wheat Road onto Harbour Street has also been assessed;

x) a preliminary construction traffic management plan has been prepared;

xi) the traffic matters raised in the SEARS have been addressed; and

xii) the traffic matters raised by RMS and TFNSW have been addressed.

Location Plan

Colston Budd Rogers & Kafes Pty Ltd

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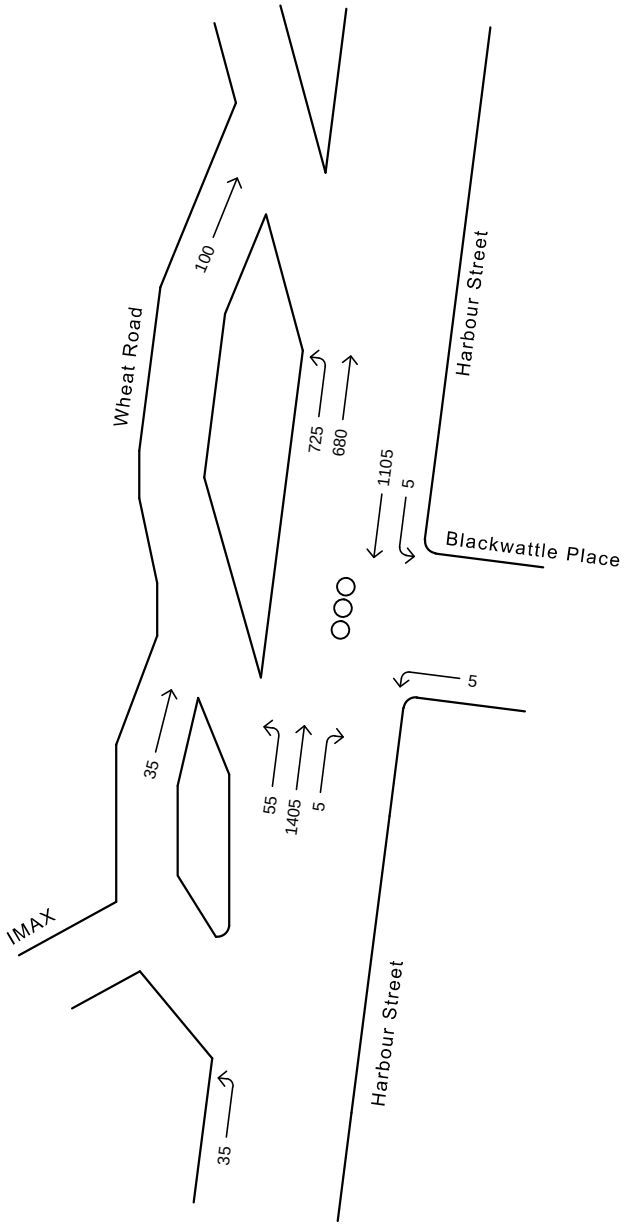
Figure 1



LEGEND

100 - Existing Peak Hour Traffic Flows

- Traffic Signals

Existing plus ribbon weekday morning peak hour traffic flows

Colston Budd Rogers & Kafes Pty Ltd

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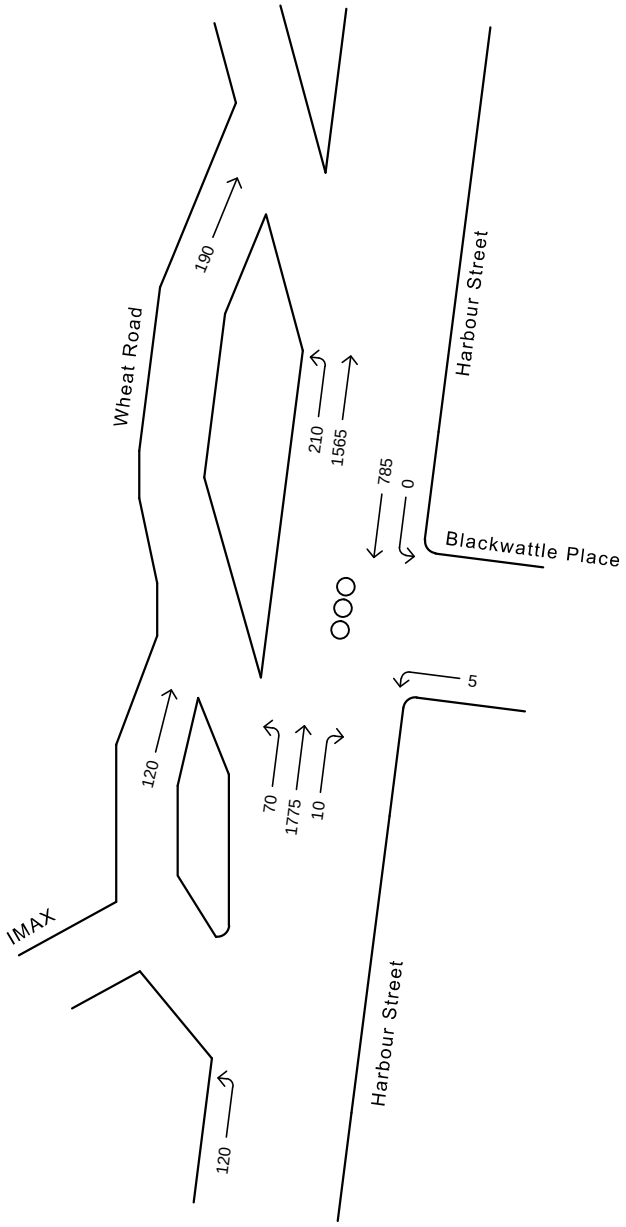
Figure 2



LEGEND

100 - Existing Peak Hour Traffic Flows

- Traffic Signals

Existing plus ribbon weekday afternoon peak hour traffic flows

Colston Budd Rogers & Kafes Pty Ltd

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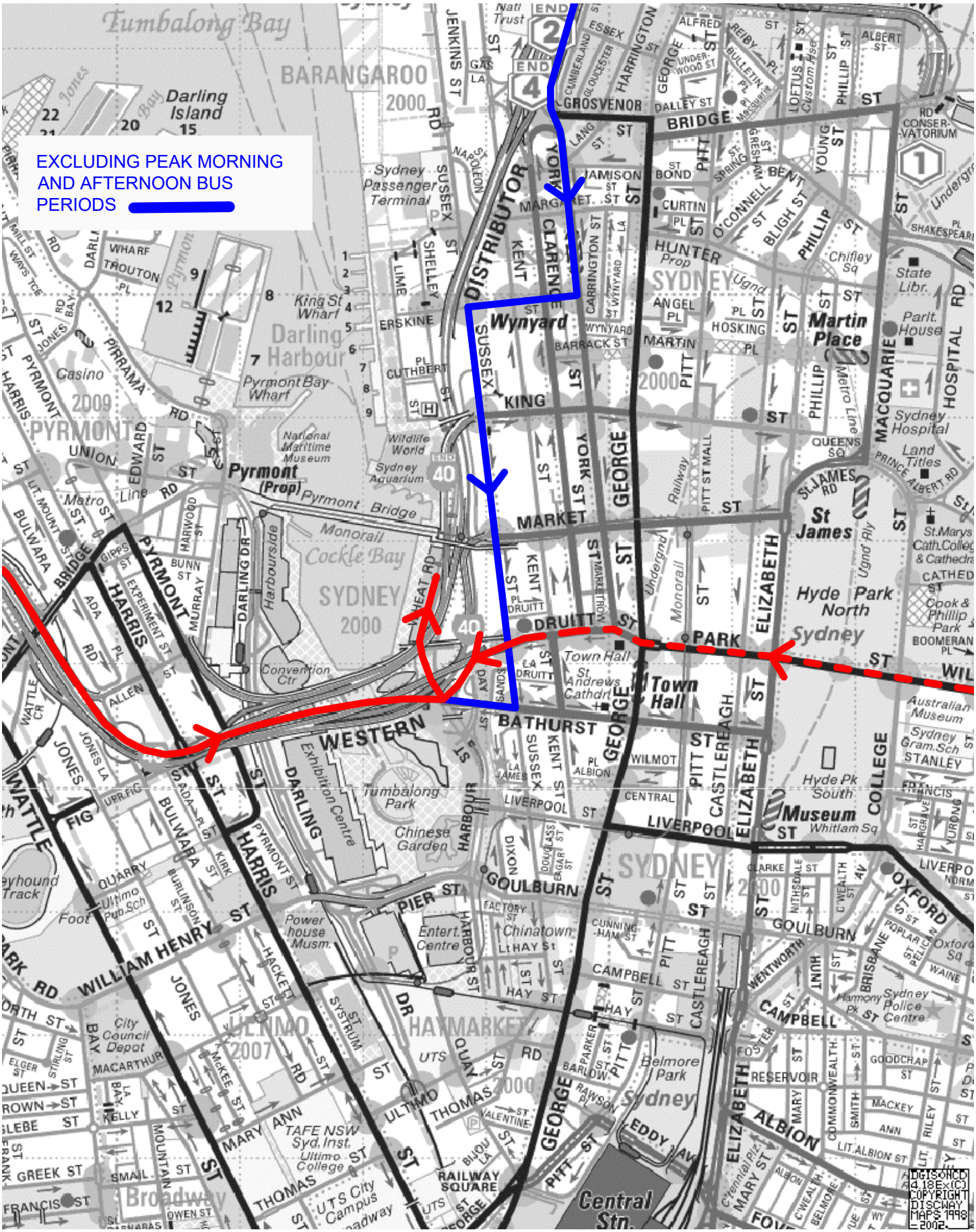
Figure 3



Truck Routes - Approach Routes

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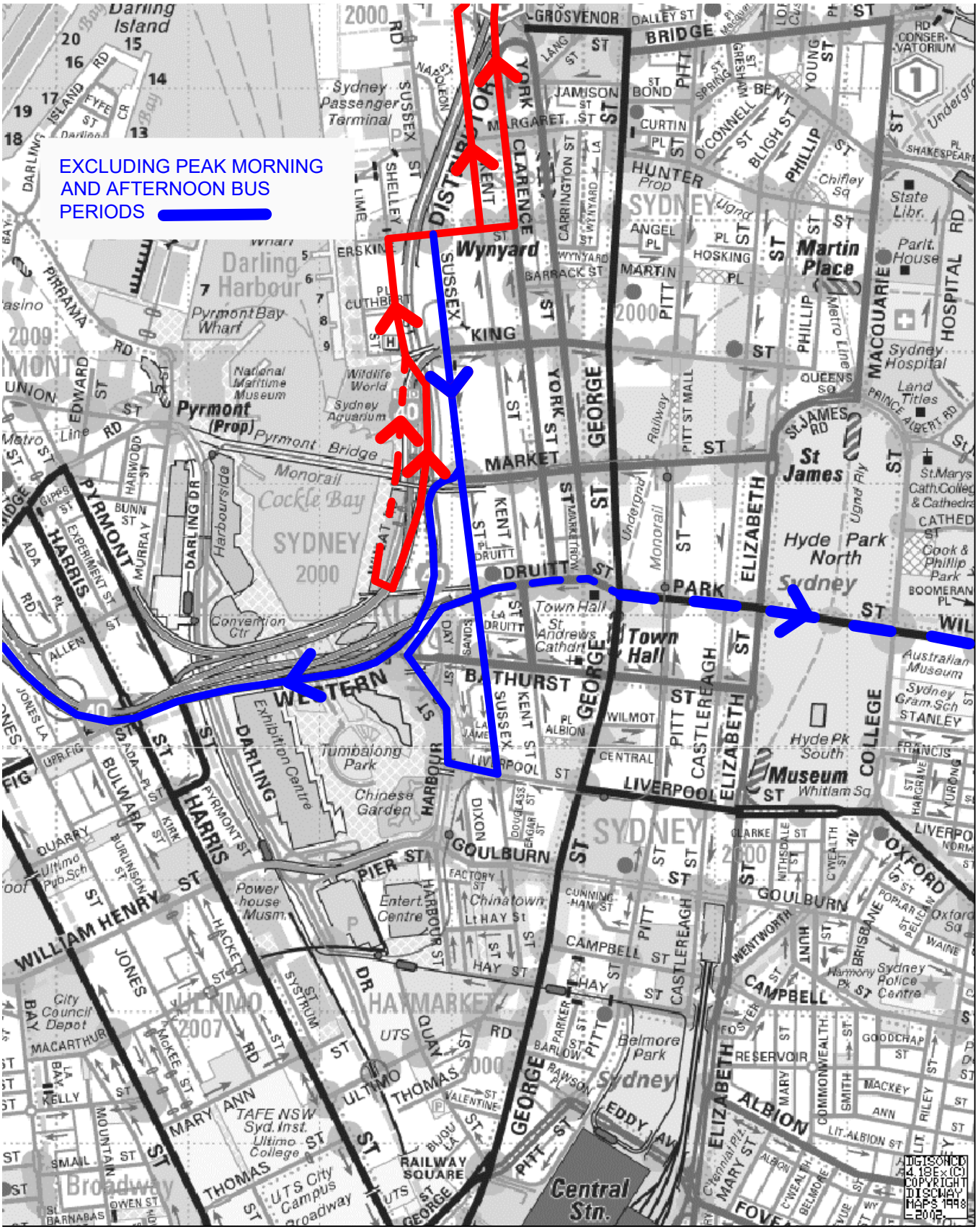
DRAWN BY CBRK Pty Ltd_mr Ref: 10166/3 14 August 2017

Figure 4



Truck Routes - Departure Routes

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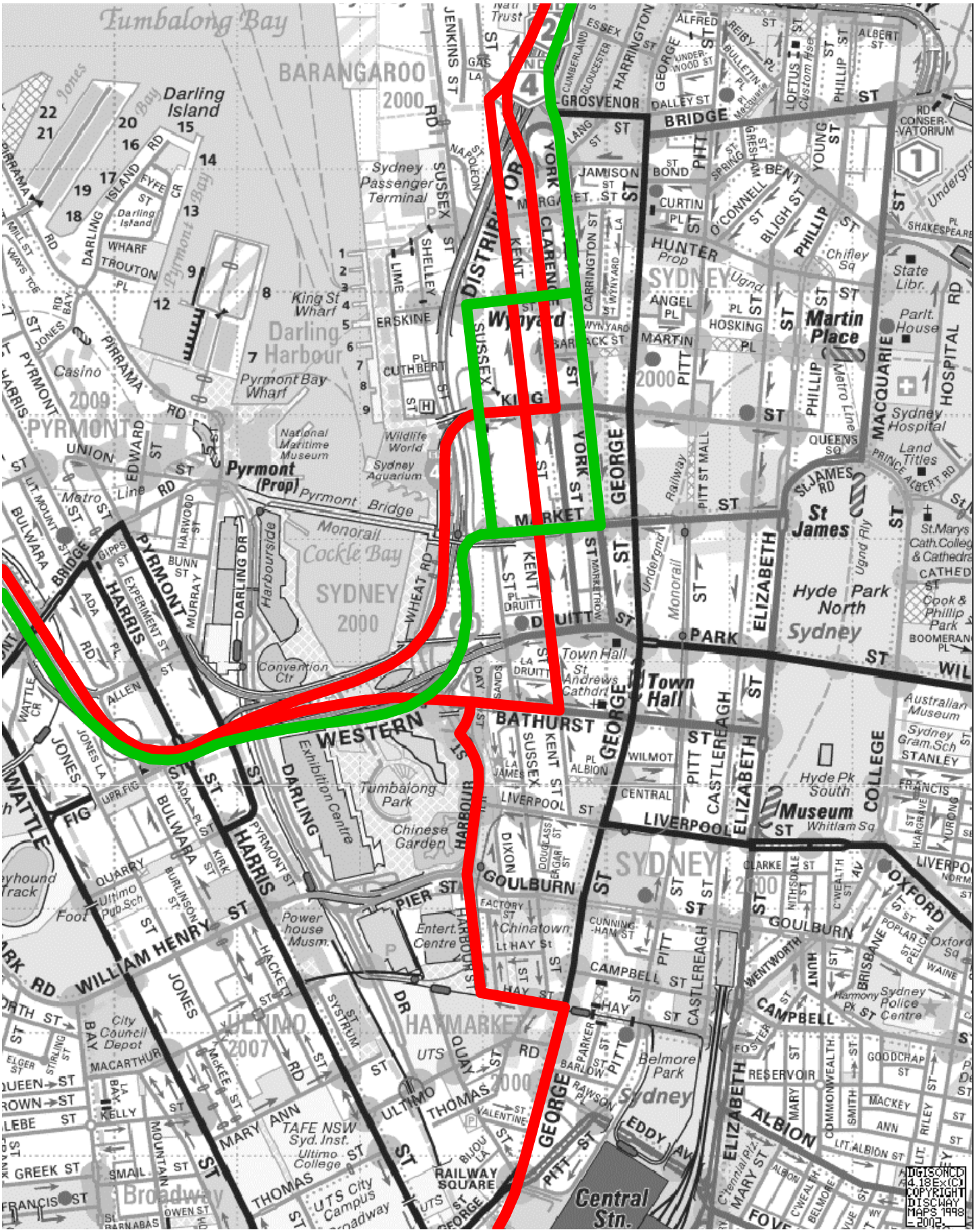
Figure 5



Western Distributor northbound closed at king street off-ramp and harbour street northbound closed at Bathurst Street

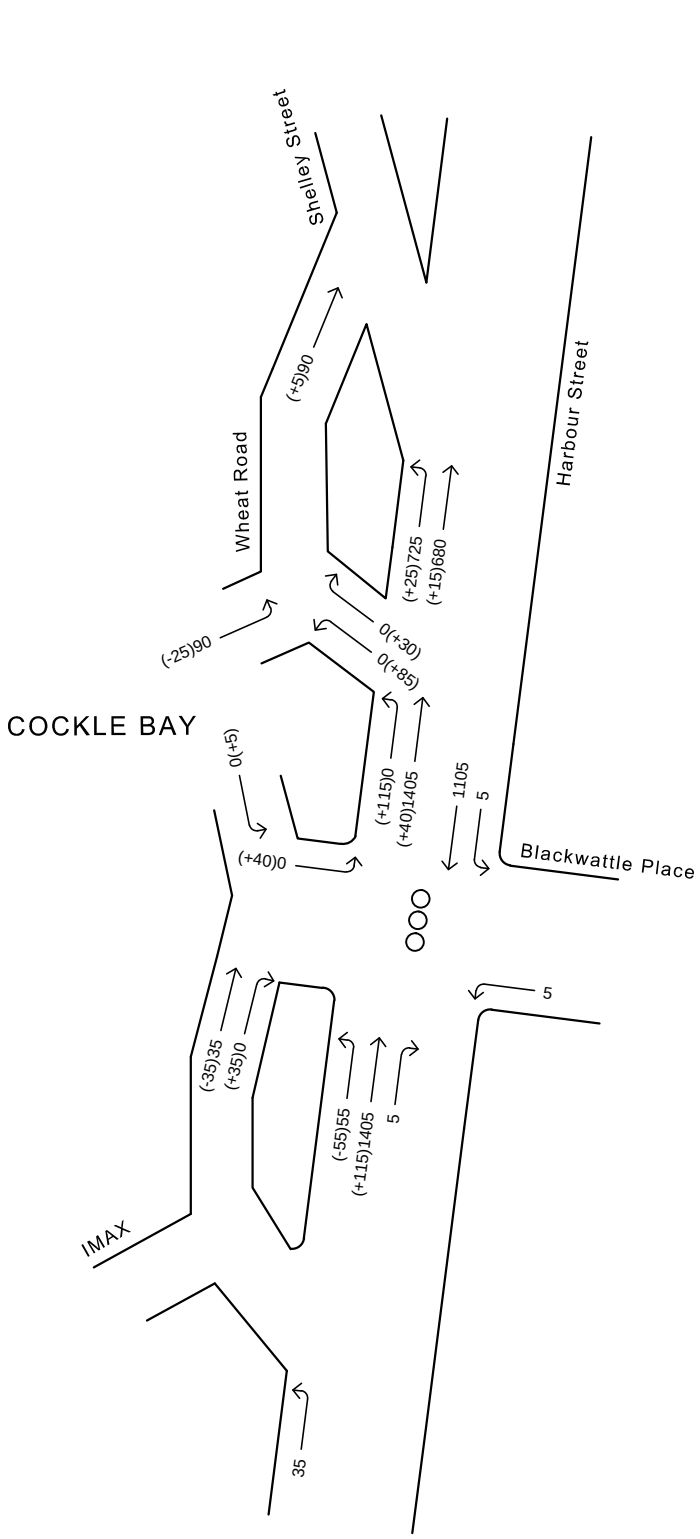
Western Distributor southbound on-ramp closed at Bradfield Highway

Traffic Diversions

Colston Budd Rogers & Kafes Pty Ltd

DRAWN BY CBRK Pty Ltd_mr Ref: 10166/3 14 August 2017

Figure 6



LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals

Existing weekday morning peak hour traffic flows plus development traffic - Base Case

Colston Budd Rogers & Kafes Pty Ltd

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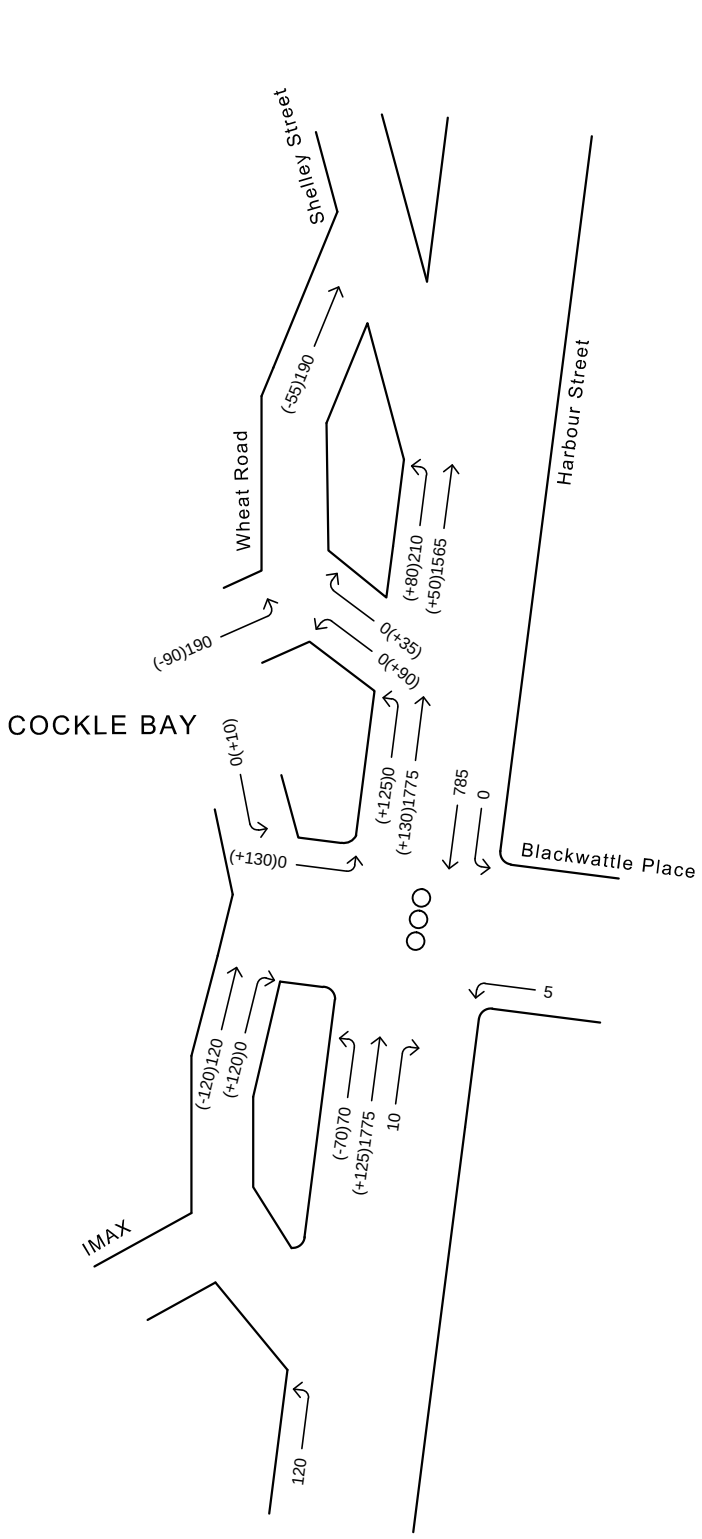
Figure 7



LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals

Existing weekday afternoon peak hour traffic flows plus development traffic - Base Case

Colston Budd Rogers & Kafes Pty Ltd

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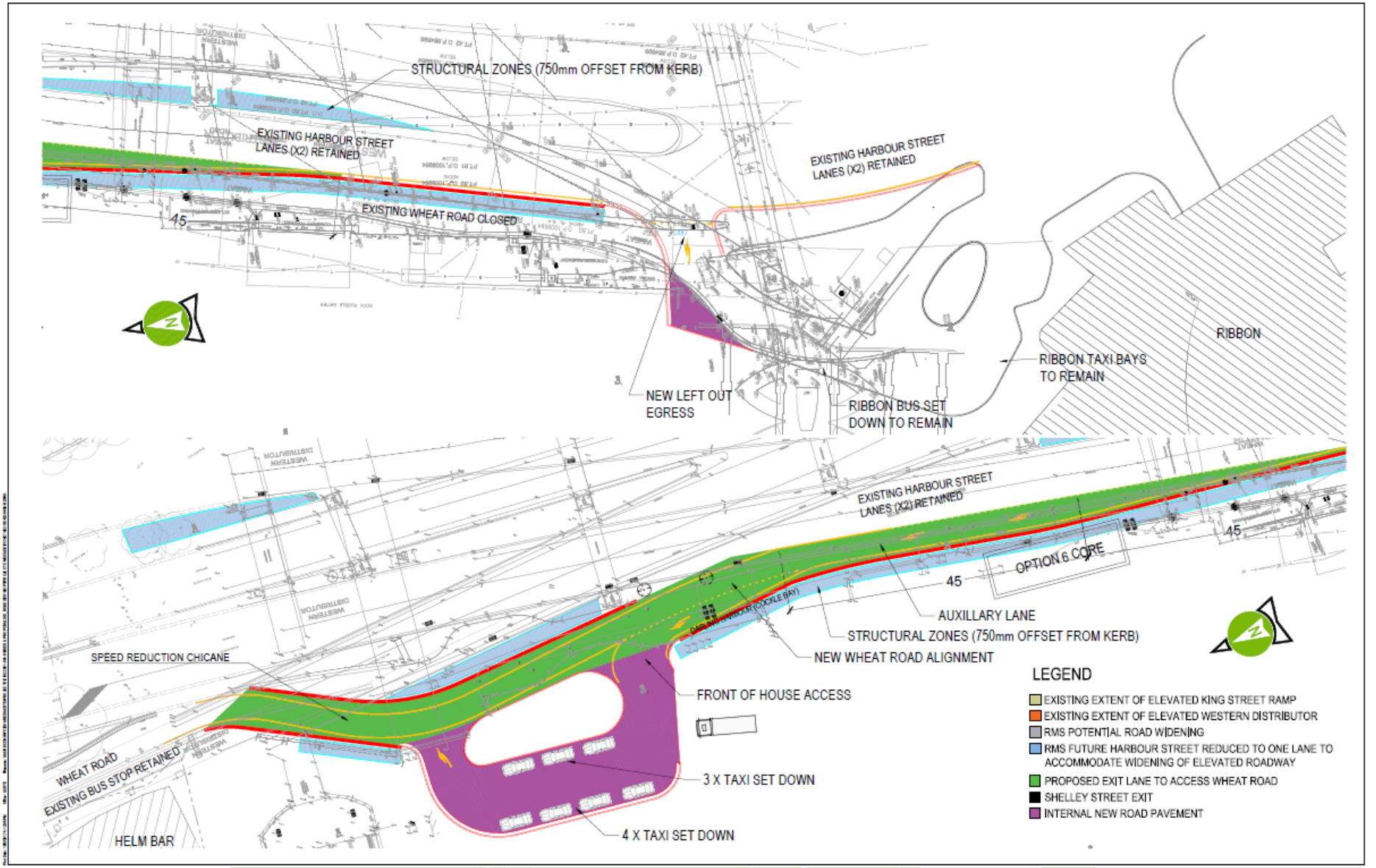
Figure 8

ATTACHMENT A

WHEAT ROAD RECONFIGURATION CONCEPT PLAN

Base case



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REV	DATE	REVISION DETAILS	APPROVED
A	07.06.17	DRAFT FOR COMMENT	MO
B	10.06.17	KERB & LEGEND AMENDED	MO

SCALE 1:250 | SIZE A1
DRAWN NO
DESIGNED NO
REVIEWED
NOT FOR CONSTRUCTION
APPROVED DATE

PROJECT: COCKLE BAY WHARF DARLING HARBOUR
TITLE: ROAD WORKS HARBOUR STREET ACCESS BASE CASE OPTION
DRAWING No. 253427 – 002 – SK – RD – 0005 – B

ATTACHMENT B

VEHICLE TURN PATHS

CONCRETE PAD

CONCRETE PAD

CONCRETE PYLON

B99CAR
CBHK(Austroads13)

SRV 6-4m
CBHK(Austroads13)

B99CAR
CBHK(Austroads13)

B99CAR
CBHK(Austroads13)

BUS 14-5m
CBHK(Austroads13)

BUS 14-5m
CBHK(Austroads13)

BUS SET-DOWN ZONE

TAXI BAYS

E 333700
N 6250500

E 333700
N 6250450

RETAIL LIFT
B11.90 m2

16.8 m2

TAIL GOODS LIFT
1 m2

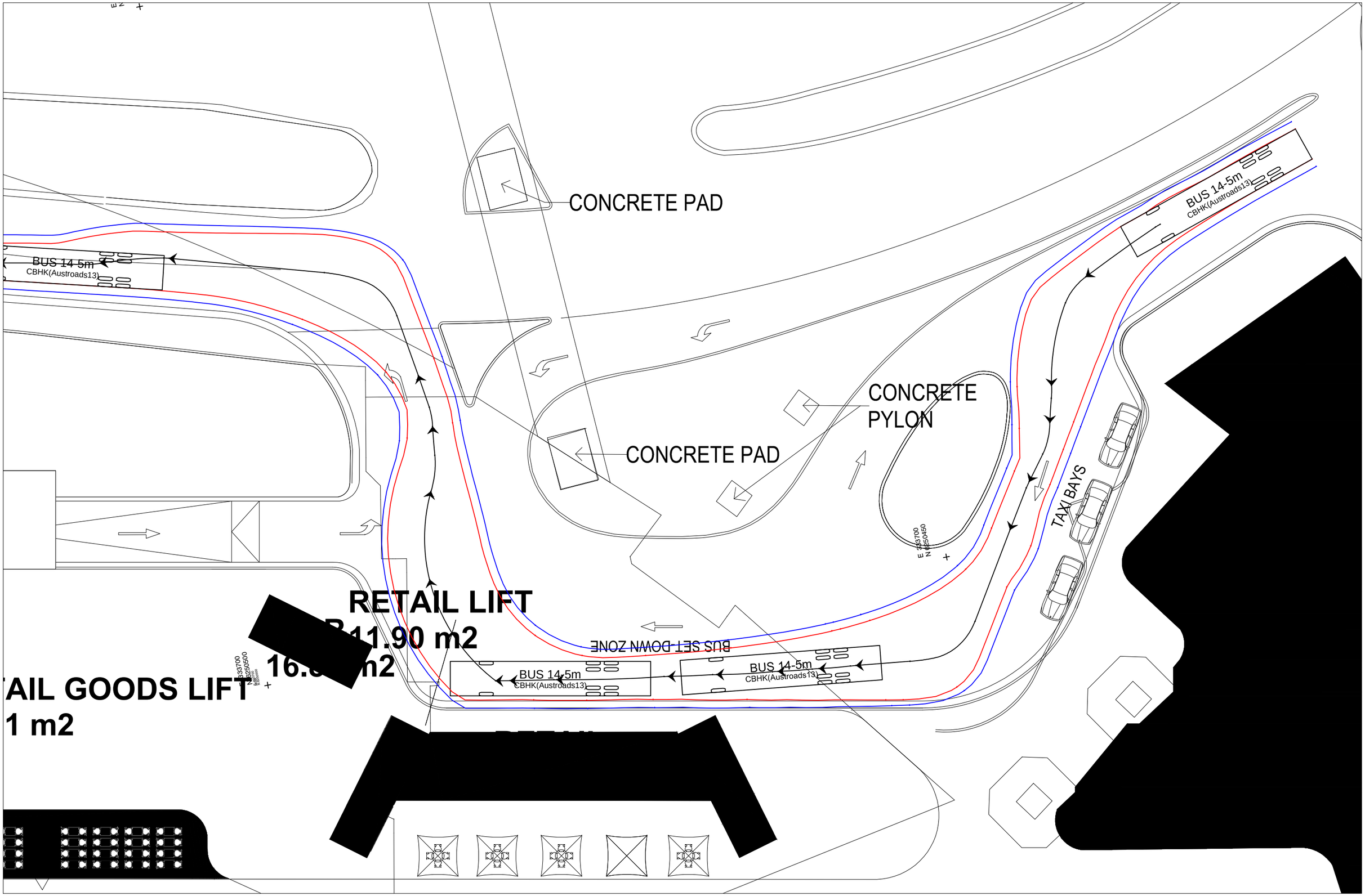
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

B99 & 6.4m SMALL RIGID VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10166 21 SEPTEMBER 2017

4



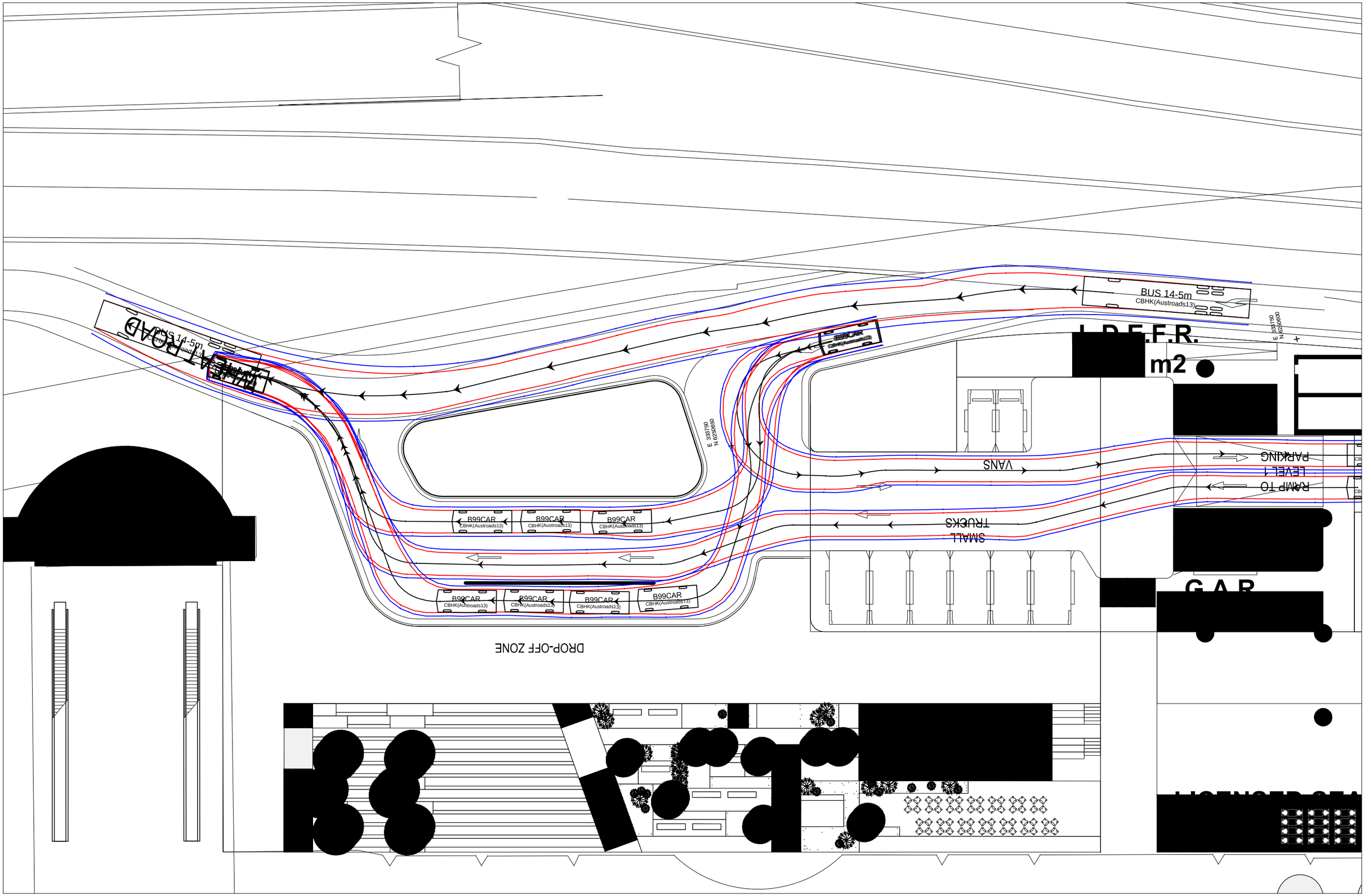
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

14.5m BUS VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10166 21 SEPTEMBER 2017

5



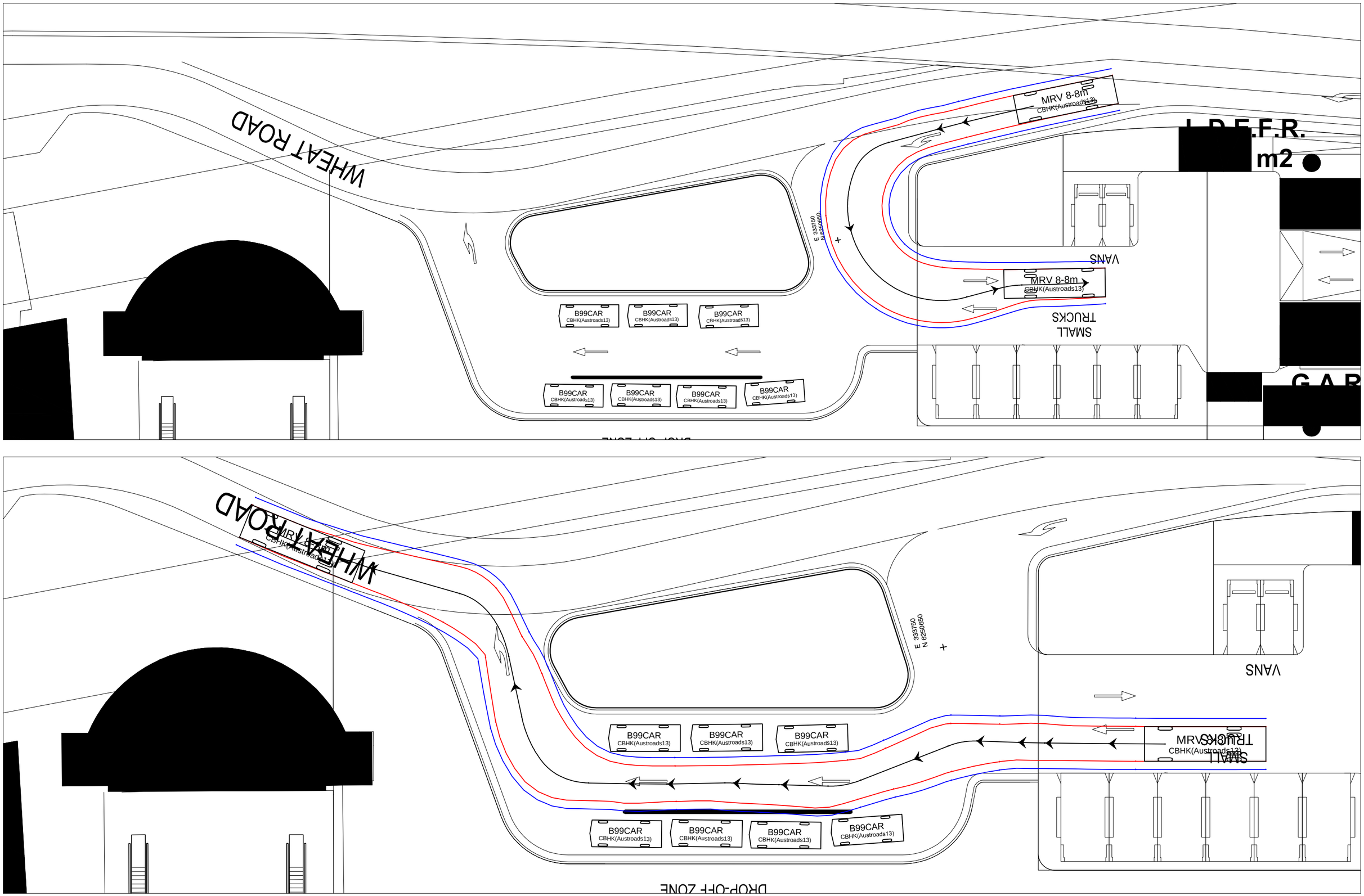
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

B99 & 14.5m BUS VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10166 21 SEPTEMBER 2017

6



NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

8.8m MEDIUM RIGID VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10166 21 SEPTEMBER 2017

ATTACHMENT C

OPTIONS FOR WHEAT ROAD CONNECTION TO HARBOUR STREET

C. OPTION FOR WHEAT ROAD CONNECTION TO HARBOUR STREET

C.1 An option for the provision of a right turn egress onto Harbour Street from Wheat Road at the southern end of Cockle Bay Park has been assessed. The option involves modifying the existing traffic signals at the intersection of Blackwattle Place and Harbour Street to allow left and right turn egress from Wheat Road onto Harbour Street and left turn ingress would also be provided from Harbour Street to Wheat Road. This left turn would provide access to the Ribbon Development set down/pick up area and allow for modifications to the approved Ribbon development access from Harbour Street (located south of Blackwattle Place). The traffic effects of the proposed modifications are set out below.

C.5 With left and right turns onto Harbour Street, 35% of traffic departing the site car park and from the Ribbon development, has been assigned to turn right onto Harbour Street with the balance turning left (either to travel north onto the Harbour Bridge or access the CBD via Shelley Street). Thus 15 and 50 vehicles per hour would turn right onto Harbour Street from Wheat Road, in the weekday morning and afternoon peak hours respectively (rather than turn left). Flows are shown in Figures 9 and 10.

C.6 The impact of the proposed modified egress onto Harbour Street has been assessed using SIDRA. The analysis found that the modified intersection of Harbour Street/Blackwattle Place/Wheat Road would operate with average delays of less than 15 seconds per vehicle in the morning and afternoon peak periods, with left out only and left and right out.

C.7 The analysis found that the new signals would have minimal effect on traffic flows along Harbour Street. Queuing northbound on Harbour Street would be minimal

(95% back of queue of 20 metres) and thus would not impact on the operation of the downstream intersection (Bathurst Street).

C.8 RMS has indicated that it did not support the proposed right turn egress to Harbour Street due to existing queuing on Harbour Street (both directions) and the impact modifications to the signals would have on Harbour Street traffic flows. RMS also noted that it has long term plans to upgrade the Western Distributor connection to the Harbour Bridge and that this may involve modifications to the Harbour Street connection to the Western Distributor.

C.9 As set out in Chapter 2, there was effectively no queuing northbound on Harbour Street through the Blackwattle Place intersection. Thus the provision of a left turn egress would allow traffic to exit the site satisfactorily. As noted above, the SIDRA analysis found that the proposed modifications would result in minimal queuing to northbound traffic flow on Harbour Street (with appropriate coordination with the signalized intersection located to the south) and thus would not impact on the downstream intersection at Bathurst Street. In summary the analysis has found that provision of a signalized left turn onto Harbour Street from Wheat Road (at Blackwattle Place) would operate satisfactorily.

C.10 With regard to provision of a right turn out of Wheat Road and the impact on southbound traffic flow on Harbour Street, the observations of queuing on Harbour Street noted that queues can extend back through the Blackwattle Place intersection in the peak periods (mainly in the morning peak period). These queues occur for a short period and generally clear each cycle. Thus provision of a right turn egress from Wheat Road should be satisfactory.

C.11 Provision of right turn egress from Wheat Road onto Harbour Street will provide direct egress from the site to the arterial road network and result in less traffic

having use Harbour Street (north of the site) or to pass through Shelley Street and the King Street Wharf precinct located immediately north of the site

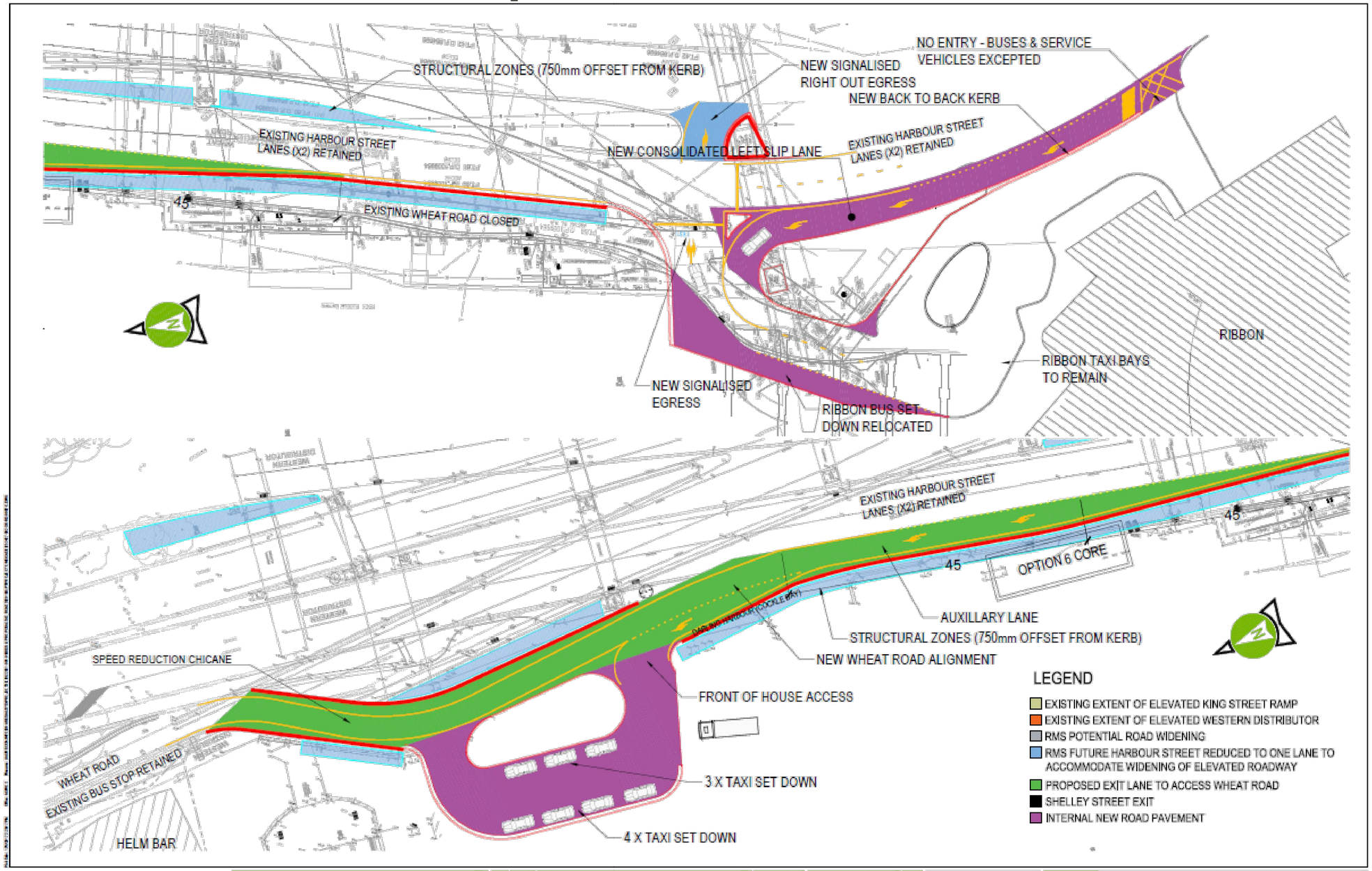
C.13 Provision of the left turn into Wheat Road from Harbour Street at Blackwattle Place allows the approved Ribbon development connection to Wheat Road (located south of Cockle Bay Park) to be reconfigured to improve access arrangements. As per the approved development, ingress would be provided from Harbour Street at the Ribbon access for service vehicles and buses/coaches (including the bus/coach set down pick up area located at the southern end of Cockle Bay). However, car park (set down/pick up) and taxi ingress would be relocated to the north (at the southern of Cockle Bay Park). This arrangement would reduce conflicts at Ribbon access, improve circulation/queuing for the Ribbon development and reduce the potential for traffic to queue back onto Harbour Street.

Summary

C.15 In summary the option to modify the existing traffic signals at the intersection of Blackwattle Place/Harbour Street to provide for left and right turn egress onto Harbour Street and left turn ingress from Harbour Street, would have:

- minimal impact on traffic flow on Harbour Street;
- reduce traffic flows on Harbour Street (north);
- reduce traffic in Shelley Street and the King Street Wharf precinct;
- improve accessibility from the site; and
- allow for improvements in access to the Ribbon development and reduce conflicts at the Ribbon access from Harbour Street.

Base case + option 2



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CLIENT

REV	DATE	REVISION DETAILS	APPROVED
A	07.08.17	DRAFT FOR COMMENT	MO
B	10.08.17	NOTES AND LEGEND	MO
C	17.08.17	NEW COMBINED SLIP LANE CLARIFIED	MO

SCALE	1:250
SIZE	A1
DRAWN	NO
DESIGNED	NO
REVIEWED	
APPROVED	DATE

NOT FOR CONSTRUCTION

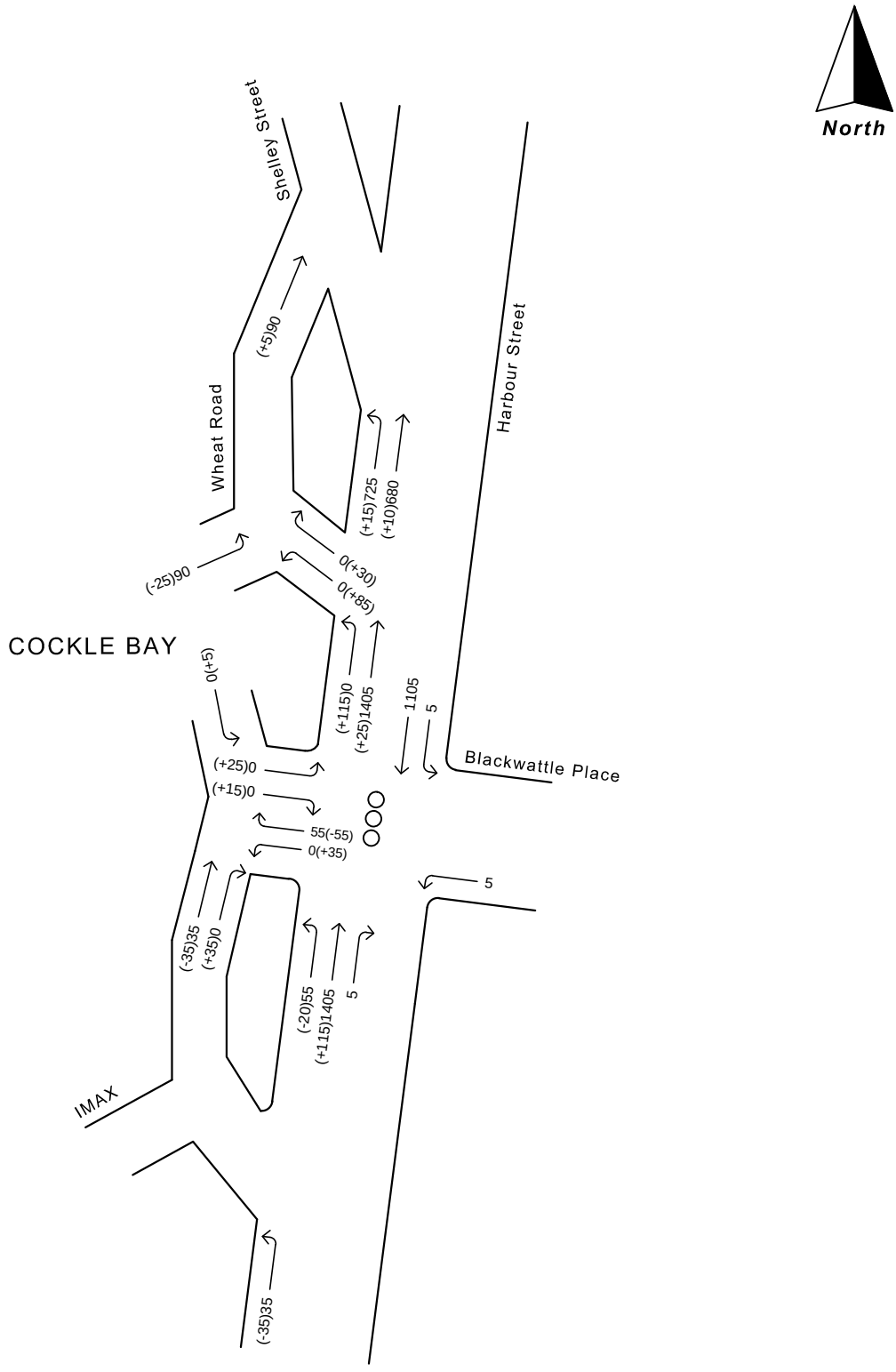
PROJECT	COCKLE BAY WHARF DARLING HARBOUR
TITLE	ROAD WORKS HARBOUR STREET ACCESS BASE CASE + OPTION 2 (SIGNALISED) LEFT/RIGHT OUT

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	253427	002	SK	RD	0007	C

Colston Budd Rogers & Kafes Pty Ltd

DRAWN BY CBRK Pty Ltd_mc Ref: 10166 14.09.2017

Figure C1



LEGEND

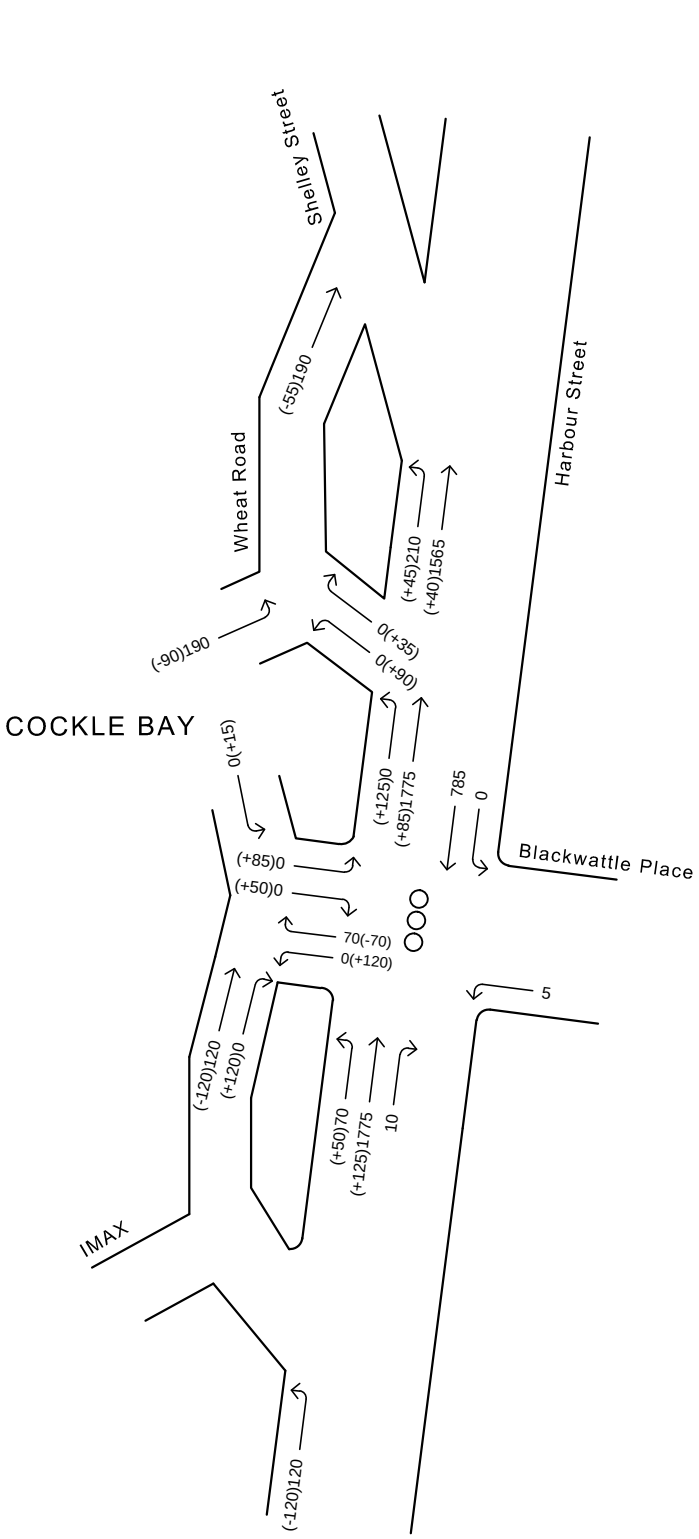
100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic

Existing weekday morning peak hour traffic flows plus development traffic

Colston Budd Rogers & Kafes Pty Ltd

DRAWN BY CBRK Pty Ltd_mr/hs Ref: 10166 17.08.2017

Figure 9



LEGEND

100 - Existing Peak Hour Traffic Flows

(+10) - Additional Development Traffic

° - Traffic Signals

Existing weekday afternoon peak hour traffic flows plus development traffic

Colston Budd Rogers & Kafes Pty Ltd

DRAWN BY CBRK Pty Ltd_mr/hs Ref: 10166 17.08.2017

Figure 10