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CIVIL ENGINEERING ASSESSMENT
Marrickville Metro Shopping Centre

YN210026 - 10 - 0109

Prepared for AMP Capital Investors

May 2010

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1 Background

1.1 Introduction

Marrickville Metro Shopping Centre is located at 34 Victoria Road, Marrickville and fronts Victoria Road to the north, Murray Street to the east, Smidmore Street to the south and single storey residential dwellings to the west. The shopping centre is predominantly a single level retail building and comprises major tenants being Kmart, Woolworths and Aldi as well as a range of speciality stores. Car parking is located at the roof top level with existing vehicular ramp access via Smidmore Street and Murray Street. The site location is shown below in **Figure 1.**

The land at 13-55 Edinburgh Road is located to the south of Smidmore Street and is bounded by Edinburgh Road and Murray Street. This site is currently used as a warehouse with associated ground level car parking.

The shopping centre is located within an established residential and industrial precinct surrounded by small lot residential housing to the north and west, and predominantly industrial land comprising larger allotments and larger scale buildings to the south and east.

Figure 1 – Location plan

AMP Capital Investors (AMPCI) are the owners of the Marrickville Metro Shopping Centre and the land to the immediate south at 13-55 Edinburgh Road, Marrickville.

Cardno (NSW/ACT) has been engaged by AMPCI to prepare a report to accompany a Concept Plan Application under Part 3A of the Environmental Planning and Assessment Act 1979 for the proposed redevelopment of the Marrickville Metro Shopping Centre. The development is being considered under Part 3A of the Act as it satisfies the criteria described in Schedule 1 of the Major Projects State Environmental Planning Policy (Major Projects SEPP).

AMPCI proposes to upgrade and expand Marrickville Metro Shopping Centre to accommodate additional retail floor space, improved facilities and services, as well as enhance convenience and accessibility for the community.

The proposal has three key elements:

- An extension of retail floor area at first floor level above the existing shopping centre building with further additional roof top parking;
- Redevelopment of the existing industrial land south of Smidmore Street (13-55 Edinburgh Road) to create a two level retail addition to the shopping centre with car parking above;
- The closure of Smidmore Street between Edinburgh Road and Murray Street in order to create a new pedestrian plaza including a two storey retail link and car parking access;
- Road network and intersection upgrades to the perimeter of the development site.

The additional retail floor area will primarily accommodate a discount department store, supermarket, mini major and specialty retail space. The development will incorporate additional car parking as well as improved vehicle access and loading facilities.

The proposal will create a new urban plaza in Smidmore Street and will be complimentary to an enhanced public space fronting Victoria Road. The proposal will include works to the public domain in order to improve the pedestrian, cycling and public transport connections to and from the site and enhance pedestrian and patron safety.

1.2 Construction Staging Details

Owing to the scale of the project and the need to undertake the development whilst maintaining a safe and functional retail centre, it is proposed that construction will occur over at least two discrete stages.

Stage 1 will involve the redevelopment of the industrial site at 13-55 Edinburgh Road to accommodate the new two level retail centre including car parking above. This work will also incorporate the creation of the pedestrian plaza and retail extension across Smidmore Street linking the two retail buildings and the refurbishment of the existing shopping centre building fronting the northern side of Smidmore Street.

Stage 2 will involve the first floor level retail extension over the existing shopping centre building with the proposed additional car parking at roof top level.

2 Civil Engineering

2.1 Introduction

This Civil Engineering Assessment has been prepared to identify and provide a framework detailing measures relating to the detailed design phase;

- Erosion and sediment controls during construction activities;
- Bulk earthworks associated with the reshaping of the site;
- Vehicular access to carpark and loading dock facilities;
- Vehicular and pedestrian access to public transport facilities,
- Infrastructure development, including road and intersection upgrades to the perimeter of the development site.

2.2 Erosion and Sediment Control

The objectives of the erosion and sediment controls proposed for the development site are to ensure;

- Adequate erosion and sediment control measures are implemented prior to the commencement of construction and are maintained during the construction stage,
- Developed site run-off is appropriately treated in accordance with the requirements of Marrickville Council and the Department of Environment, Climate Changes and Water (DECCW) requirements.

As part of the works, erosion and sedimentation controls shall be constructed generally in accordance with the drawings, Council requirements and the NSW Department of Housing Manual, “Managing Urban Stormwater Soils & Construction” 2004 prior to any earthworks commencing on site. Concept erosion and sediment controls are detailed on drawing SK-050 in Appendix A.

Erosion and sediment controls to minimise potential water quality impacts are discussed below.

2.2.1 Sediment Basin

It is recommended that a sediment basin be designed as required in accordance with the NSW Department of Housing Manual, “Managing Urban Stormwater - Soils & Construction” 2004 to control potential sediment and surface flows from the development area south of Smidmore Street during earthwork operations. The sediment basin should be located to coincide with low points at the outlet end of temporary drainage paths and at sag points along Edinburgh Road.

Initial calculations have been based on proposed undeveloped catchments and available geotechnical information regarding soil types.

The sediment basin as indicated on drawing SK-050 in Appendix A would need to be maintained on site throughout the construction works ensuring that they operate effectively in accordance with NSW Department of Housing Manual, “Managing Urban Stormwater - Soils & Construction” 2004. The water in the sediment basin shall be lowered by pumping to maintain the minimum storage volume at the lower level of the settling zone identified by pegs to clearly show the level at which design storage capacity is available.

Water pumped from the sediment basin could be utilised to irrigate areas of hydromulch and for dust control or discharged to the existing drainage network once testing has been undertaken to ensure it meets the requirements specified by Marrickville Council and the DECCW.

A weir designed in accordance with Section 6 of the NSW Department of Housing Manual, "Managing Urban Stormwater - Soils & Construction" 2004 would need to be provided at to control overland flows for rainfall events in excess of the design criteria. Sediment basin sizing and calculation shall form part of the detailed design phase.

2.2.2 Construction Measures

Prior to any earthworks commencing on site, all erosion and sediment control measures will need to be implemented generally in accordance with the above specifications. These measures shall include;

- Installation of a perimeter wind and security fence;
- Installation of a sediment basin;
- Installation of sediment fencing around disturbed areas including any topsoil stockpiles;
- Installation of silt arrestors to collect site runoff and retain suspended particles;
- Placement of hay bales around and along proposed catch drains and stormwater drainage pits.

2.3 Bulk Earthworks

2.3.1 General

It is anticipated that there will be minimal excavation or filling of the site in preparation for the construction of the proposed building based on the current proposal to construct the structure as suspended. In the event that filling is required to achieve a building platform, it is anticipated that approximately 6,000m3 would be required.

2.3.2 Construction Sequence

The sequence of work for the bulk earthworks will generally include:

- Provision of erosion and sediment control measures typically as outlined above in Section 2.2;
- Clearing of vegetation and demolition of proposed structures from the proposed development site;
- Stripping and removing from site topsoil;
- Inspection of exposed natural material to ensure conformity with design assumptions;
- Placement of cut to fill and imported material in layers not greater than 250mm in thickness and compacted to not less than 95% SMDD, subject to construction methodology.

2.3.3 Tree Removal and Protection

Trees to remain shall be protected to ensure no damage to the tree including the trunk. Trees to be removed as a consequence of earthwork levels and road alignments shall be marked on site and approval obtained prior to removal.

2.4 Roadworks

2.4.1 General

An analysis of proposed road network upgrades to the perimeter of the development has been undertaken based on concept architectural documentation. The ultimate configuration and extent of kerb alignments is subject to detailed survey and services locations along with a traffic analysis to determine possible queue lengths based on traffic generation forecasts resulting from the proposed development.

2.4.2 Road and Intersection Upgrades

Road and intersection upgrades are proposed at the following locations to facilitate increased traffic and pedestrian volumes and to provide a functional connection from the proposed development to public transport and taxi facilities.

2.4.2.1 Edinburgh Road and Smidmore Street Intersection

It is proposed to close Smidmore Street from Edinburgh Road to Murray Street in order to create a new pedestrian plaza including a two storey retail link and car parking access. Emergency vehicle access will be restricted within Smidmore Street to either side of the proposed structure and car park access ramp. As part of the closure of Smidmore Street we understand it is proposed to modify the existing traffic signals at the intersection of Edinburgh Road to facilitate a longer right turn lane and a short left turn lane in Edinburgh Road. Access to a specialty loading dock and roof top car parking is proposed from the western section of Smidmore Road. Queuing areas and horizontal geometry shall be designed to meet the requirements of AS2890.1 (2004). Preliminary investigations indicate that ramp gradients will allow queuing areas within the ramp system. Refer to drawing SK-001 in Appendix B for details.

Loading dock access will need to be restricted to large rigid vehicles in accordance with AS2890.2 (2002)

2.4.2.2 Edinburgh Road Carpark Entry and Exit

It is proposed to provide vehicular entry and exit points to roof top parking from Edinburgh Street between the Smidmore Street traffic signals and the proposed intersection works at Sydney Steel Road. Due to the proximity of the entry and exit driveway it is recommended the access driveway be limited to left in/left out movements by introducing a central median within Edinburgh Road. The northern kerb will require relocation to ensure a minimum lane configuration consisting of two westbound lanes (3.3m and 3.0m) and two east bound lanes (3.3m and 3.0m) separated by a 0.6m central median. The east bound kerb side lane will terminate to form one lane into the proposed roundabout. To discourage pedestrian movements in this location a safety fence meeting the Roads and Traffic Authority requirements could be installed. Refer to drawing SK-002 in Appendix B for details.

2.4.2.3 Edinburgh Road and Sydney Steel Road Intersection

It is proposed to construct a roundabout at the intersection of Edinburgh Road and Sydney Steel Street to allow both 12.5m and 14.5m rigid buses to undertake a U turn and access the bus terminal from an easterly direction. The proposed bus terminal is located on the northern side of Edinburgh Road between Sydney Steel Street and Murray Street. The northern kerb alignment will require relocation to ensure adequate carriageway width to accommodate bus layover and turning movements entering and departing the terminal.

The roundabout shall generally meet the requirements of Austroad's, Guide to Road Design, Part 4B: Roundabouts published in 2009. The centre island shall be designed as a mountable island to allow the 14.5m rigid bus to undertake a U turn and for the 19m articulated vehicle to travel both east and west along Edinburgh Road. U turns for vehicles larger than the 14.5m rigid bus shall not be permitted.

Possible service adjustments and a boundary adjustment to the north will be required to facilitate these works. Refer to drawing SK-002 in Appendix B for details.

2.4.2.4 Smidmore Street and Murray Street Intersection

The existing roundabout at Smidmore Street and Murray Street is to be adjusted to facilitate the closure of Smidmore Street west of Murray Street and to allow for an indented taxi set down and pickup area. Existing splitter islands on Murray Street and Smidmore Street (east leg) along with the central mountable island shall remain. Refer to drawing SK-004 in Appendix B for details.

2.5 Carpark Access and Loading Docks

2.5.1 General

A review of turning path movements and car park access ramp gradients has been undertaken based on concept architectural documentation.

2.5.1.1 Smidmore Street Specialty Loading Dock

Access to the proposed specialty loading dock will need to be limited to large rigid vehicles (12.5m) in accordance with AS2890.2 (2002). All entry and exit movements shall be in a forward direction via a proposed vehicular crossing. Adequate turning areas will need to be provided to allow access to the dock face.

2.5.1.2 Smidmore Street Car park Access Ramp

As discussed in Section 2.4.2.1, adequate queuing areas and horizontal alignments shall be designed to meet the requirements of AS2890.1 (2004). Preliminary investigations indicate that ramp gradients will allow queuing areas within the ramp system. Refer to drawing SK-001 in Appendix B for details.

2.5.1.3 Murray Street (South) Loading Dock

The proposed loading dock facility is located near the intersection of Murray Street and Edinburgh Road. Access to the facility will be provided from Murray Street with access from both north and south bound vehicles. All entry and exit movements shall be in a forward direction via a proposed vehicular crossing. Initial analysis of ramp levels indicate that manoeuvring and loading areas will meet the requirements of AS2890.2 (2002) however; this will be confirmed in the detailed design phase.

2.5.1.4 New Consolidated Murray Street Majors and Specialty Loading Dock

In numerous locations along Murray Street there are existing loading docks associated with the Aldi store, fruit and vegetable and miscellaneous specialty shops. It is proposed to replace these facilities with a single consolidated dock facility.

All entry and exit movements for the consolidated loading dock facility shall be in a forward direction via a proposed vehicular crossing; however entry for 19m articulated vehicles will need to be from the south along Murray Street to allow manoeuvring within the dock area. Initial

of AS2890.2 (2002) however; this will be confirmed in the detailed design phase. Refer drawing SK-008 in Appendix B.

2.5.1.5 Murray Street Car Park Access Ramp

Adequate queuing areas shall be designed to meet the requirements of AS2890.1 (2004) and preliminary investigations indicate that ramp gradients will allow queuing areas within the ramp system. The proximity to Victoria Road will require further assessment of traffic queuing lengths during the detailed design phase to ensure entry queue lengths do not adversely impact on Victoria Road. It is also noted the proximity of the entry ramp to the loading dock access and it is suggested adequate signage will be required to ensure vehicles do not confuse the loading dock with the car park access ramp.

2.5.1.6 Existing Major Tenant, Smidmore Street Loading Dock

It is proposed to maintain the existing loading dock facility located in the south western corner of the existing shopping centre. No amendments are being considered to this loading dock facility with the exception of combining the vehicular crossing with the access to the proposed loading dock immediately to the east. Refer drawing SK-001 in Appendix B.

2.6 Services

2.6.1 General

A services search has been undertaken and based on documentation provided by the relevant service providers, it is evident that the majority of service providers have assets located within the road network surrounding the development. The proposed works associated with intersection and road upgrades could affect services however, this will be subject to detailed design.

The location of proposed street trees and associated landscape elements may also affect existing services and further investigation by test pits excavated by hand within the existing footways is recommended to determine the full extent of possible service relocations or adjustments.

2.6.2 Water supply services

2.6.2.1 Existing Water Supply Services

The approximate location and size of existing potable water mains have been obtained from Sydney Water Corporation documentation. This information indicates the following services are present in the surrounding road network;

- 150mm DICL main is located on the northern verge of Smidmore Street;
- 150mm CICL main is located in the northern verge of Edinburgh Road;
- 150mm CICL main is located in the eastern verge of Murray Street;

2.6.2.2 Proposed Water Supply Services and adjustments

Proposed potable water connection opportunities exist in both Smidmore Street and Edinburgh Road. Existing services within Smidmore Street and Edinburgh Road will require adjustments to facilitate proposed kerb alignments.

Proposed water supply services, connections and adjustments have been investigated by Golder Associates and are discussed in the Infrastructure and Hydrology Study.

2.6.3 Sewerage services

2.6.3.1 Existing Sewerage Services

The approximate location and size of the existing sewerage infrastructure has been obtained from Sydney Water Corporation documentation. This information indicates the following services are present within and surrounding road network;

- 300mm sewer main is located within the existing shopping centre site, located along the Murray Street boundary;
- 300mm sewer main in located with Smidmore Street from Murray Street joining into a 300mm sewer main traversing the proposed development site south of Smidmore Street;
- Varying size sewer mains also exist with Edinburgh Road, Victoria Road and Edgeware Road.

The exact location and depth of the sewer mains will need to be confirmed prior to formalising the proposed connection point.

2.6.3.2 Proposed Sewerage Services and adjustments

Based on the current existing sewer main locations, the 300mm diameter main traversing the development site between Smidmore Street and Edinburgh Road will require relocation along the boundary alignments of Murray Street and Edinburgh Road. The existing sewer main running parallel to Murray Street north of Smidmore Street may need to be protected at the proposed car park entry and exit ramp locations.

Proposed sewer services, connections and adjustments have been investigated by Golder Associates and are discussed in the Infrastructure and Hydrology Study.

2.6.4 Electricity supply services

2.6.4.1 Existing Electricity Infrastructure

Based on the current existing electrical documentation, electrical services are present in both Murray and Smidmore Streets. Both aerial and underground services are present.

2.6.4.2 Proposed Electricity Connection and adjustments

It is proposed to provide an electrical substation within the development, located adjacent to the loading and service area accessible from Smidmore Street. It is anticipated that an easement for electrical purposes will be required within the loading dock area. Existing services with Smidmore Street may need to be relocated to suit the proposed building form.

It is noted that existing services within Edinburgh Road will require adjustments to facilitate proposed kerb alignments.

2.6.5 Telecommunications services

2.6.5.1 Existing Infrastructure

The approximate location of major communication network connections and optic fibre services has been determined from drawings provided by the relevant service authorities. Conduits containing these cables area located within the verges around the site, with access chambers at the intersection of Murray Street and Smidmore Street and Murray Street and Edinburgh Road.

No evidence of PowerTel/AAPT or other telecommunication providers where present at the time this report was prepared.

2.6.6 Proposed telecommunications connection and adjustments

It is not expected that road works associated with the development will affect telecommunication services, subject to further investigation and detailed design. Liaison with telecommunications services providers will be required as more detailed design of the development proceeds.

It is noted that existing services within Edinburgh Road will require adjustments to facilitate proposed kerb alignments.

2.6.7 Gas supply services

2.6.7.1 Existing Gas Infrastructure

The approximate location of natural gas supply mains has been determined from drawings provided by AGL.

Gas mains for distributing gas to consumers at normal supply pressure run along the northern verge of Edinburgh Road and the western verge of Murray Street.

2.6.7.2 Proposed Gas Connection and adjustments

Opportunities for connection to the gas supply exist along the full length of the Murray Street and Edinburgh Street frontage.

Liaison with gas providers will be required as the project advances into the detailed design phase and the demand requirements have been determined.

It is noted that existing services within Edinburgh Road will require adjustments to facilitate proposed kerb alignments.

2.6.8 Stormwater drainage

Inground stormwater drainage is present within the surrounding road network and through the proposed development site. This report is not intended to discuss stormwater drainage and it is understood a separate Infrastructure and Hydrology report has been prepared by Golder Associates addressing existing and proposed stormwater drainage systems and requirements along with existing and future flood modelling.

It is noted that existing stormwater drainage pit locations within Edinburgh Road will require adjustments to facilitate proposed kerb alignments.

3 Conclusion

This report has been prepared to accompany a Concept Plan Application under Part 3A of the Environmental Planning and Assessment Act 1979 for the proposed redevelopment of the Marrickville Metro Shopping Centre. The development is being considered under Part 3A of the Act as it satisfies the criteria described in Schedule 1 of the Major Projects State Environmental Planning Policy (Major Projects SEPP).

AMPCI proposes to upgrade and expand Marrickville Metro Shopping Centre to accommodate additional retail floor space, improved facilities and services, as well as enhance convenience and accessibility for the community.

Based on available architectural, traffic and services information an assessment of the civil engineering aspects of the proposed development has been undertaken. Proposed car park and loading dock facilities have be assessed to determine compliance with the necessary Australian Standards. Intersection and road network upgrades have been identified to accommodate potential increased traffic likely to be generated by the proposed shopping centre extension. These recommendations have been assessed to determine the possible impacts on services and also to determine whether adequate lane widths and turning facilities are provided to accommodate service vehicles.

Based on initial assessments and subject to further design and consultation with the relevant authorities and stakeholders, the proposed works within and surrounding the development site will provide the necessary facilities to improve accessibility and safety within the surrounding road network along with a safe environment for vehicular and pedestrian access within the development.

4 References

4.1 Infrastructure and Hydrology

Proposed Extension of Marrickville Metro, Infrastructure and hydrology Study, prepared by Golder Associates dated 4 May 2010.

4.2 Architectural Documentation

Drg No.	Title
EA000	TITLE SHEET (Drawing List + Perspective View)
EA001	SITE PLAN
EA002	SITE ANALYSIS
EA003	EXISTING GROUND PLAN
EA004	EXISTING ROOFTOP CAR PARK PLAN (LEVEL1)
EA005	EXISTING ROOF PLAN
EA006	PROPOSED GROUND FLOOR PLAN
EA007	PROPOSED LEVEL1 PLAN
EA008	PROPOSED ROOFTOP CAR PARK A(LEVEL 2)
EA009	PROPOSED ROOFTOP CAR PARK (LEVEL2a)
EA010	PROPOSED ROOF PLAN
EA011	OVERALL ELEVATIONS (4 of)
EA012	OVERALL ELEVATIONS (3 of)
EA013	OVERALL SECTIONS (3 of)
EA014	SHADOW DIAGRAMS 0900/1200/1500 FOR DEC 21/JUNE 21/MARCH 21/SEP 21
EA015	VIEW 1 (SMIDMORE STREET PLAZA)
EA016	VIEW 2 (EDINBURGH ROAD)
EA017	PROPOSED GROUND FLOOR PLAN STAGE 1
EA018	PROPOSED LEVEL 1 PLAN STAGE 1
EA019	ALTERNATE PLAN OF GROUND FLOOR (SMIDMORE STREET OPEN)

Appendix A

Concept Erosion and Sediment Control Plan

TEMPORARY SEDIMENT BASIN 1 CALCULATION

$V_{setting\ zone}$ = 10.Cv.A.R^{Rm}
= 10 x 0.5 x 1.20 x 19
= 114m³

$V_{sediment\ zone}$ = 50% x $V_{setting\ zone}$
= 57m³

Total Volume Required = $V_{setting\ zone}$ + $V_{sediment\ zone}$
= 171m³

REFER TO LANDCOM BLUEBOOK SECTION 6

ELEVATION

PLAN

TEMPORARY CONSTRUCTION EXIT (WASH DOWN DETAIL)

SCALE 1:200

THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE REPAIR AND OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.

SEDIMENT FENCE
NTS

GEOTEXTILE FILTER PIT SURROUND
NTS

SANDBAG SEDIMENT TRAP FOR KERB INLET ON GRADE
NTS

NOT CONSTRUCTION ISSUE

Rev	Date	Description	Drawn	Appr.
C	21.05.10	REISSUED FOR INFORMATION	MDH	MKH
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A	07.05.10	ISSUED FOR INFORMATION	PD	MKH

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Marrickville Metro Shopping Centre

SEDIMENT AND EROSION PLAN

Status: FOR INFORMATION

Date	Datum	Scale	Size
MAY '10'	AHD	1:500	A1

Drawing Number: 210026-SK-050
Revision: C

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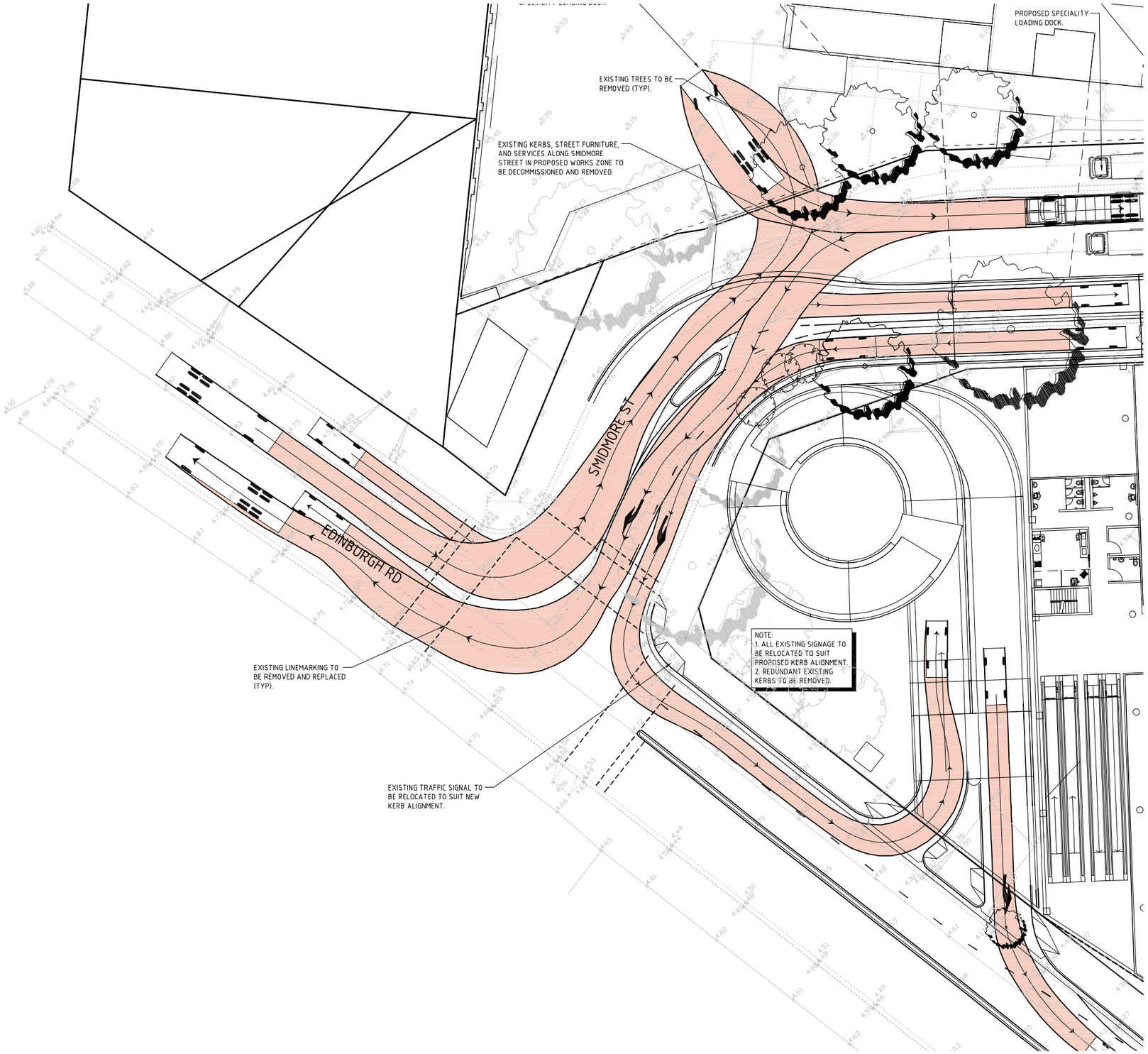
Appendix B

Concept Roadworks and Intersection Plans



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EDINBURGH ROAD AND SMIDMORE ST ENTRY AND EXIT

Status: FOR INFORMATION			
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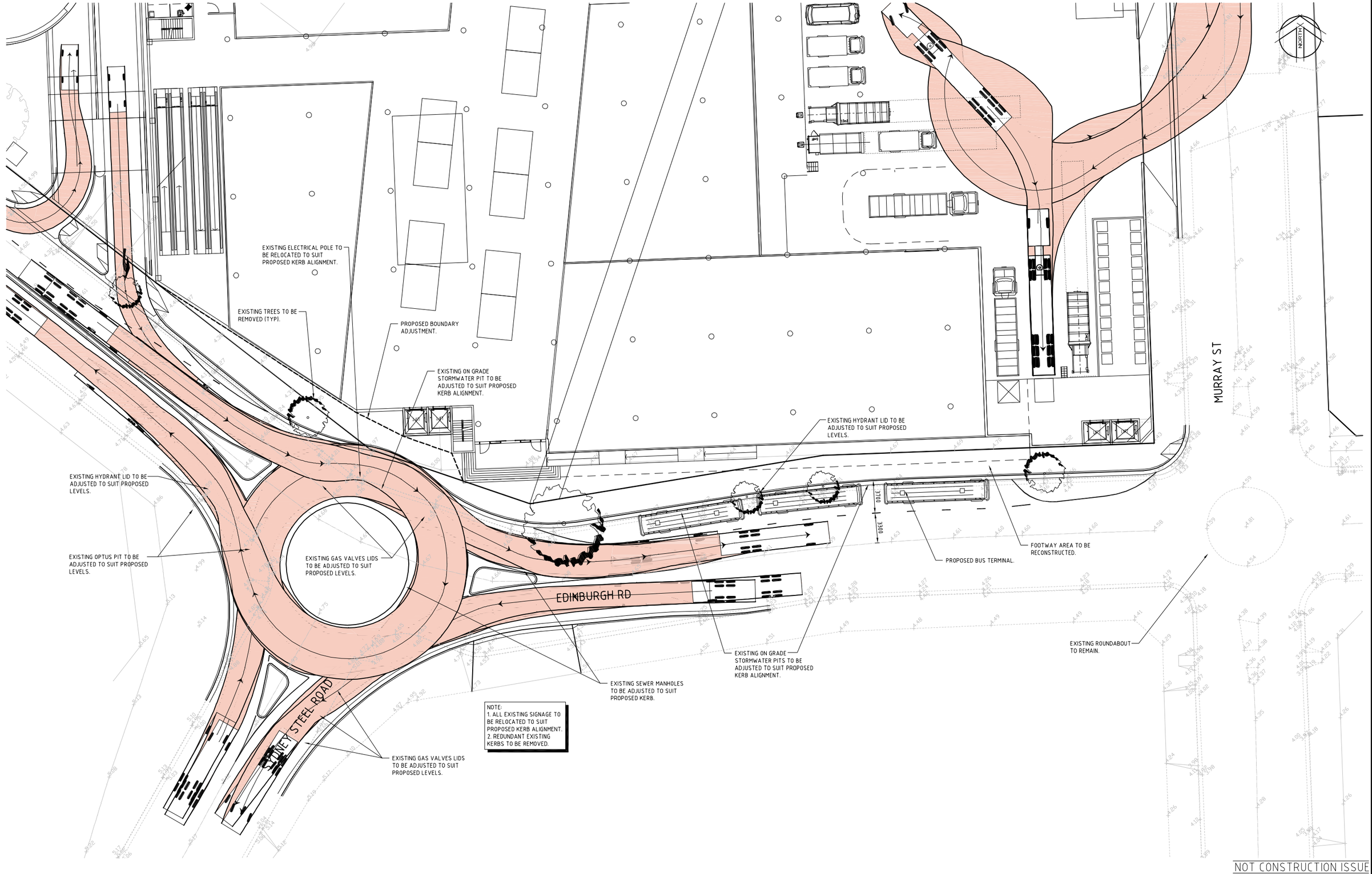

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EDINBURGH ROAD AND SYDNEY STEEL ROAD ROUNDABOUT

Status			
FOR INFORMATION			
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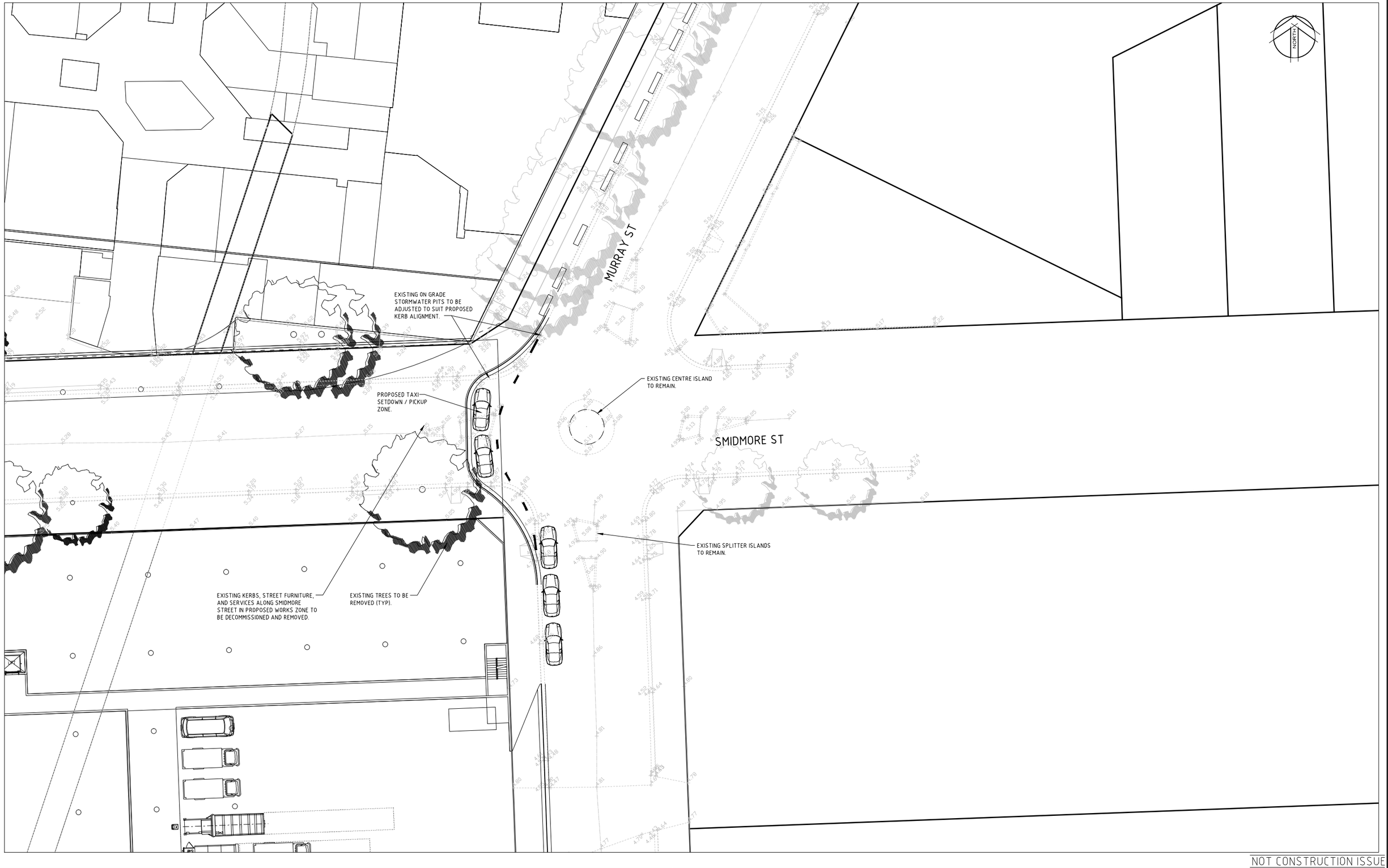

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MURRAY STREET AND SMIDMORE STREET INTERSECTION

Status: FOR INFORMATION

Date	Datum	Scale	Size
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Drawing Number: 210026-SK-004
Revision: B

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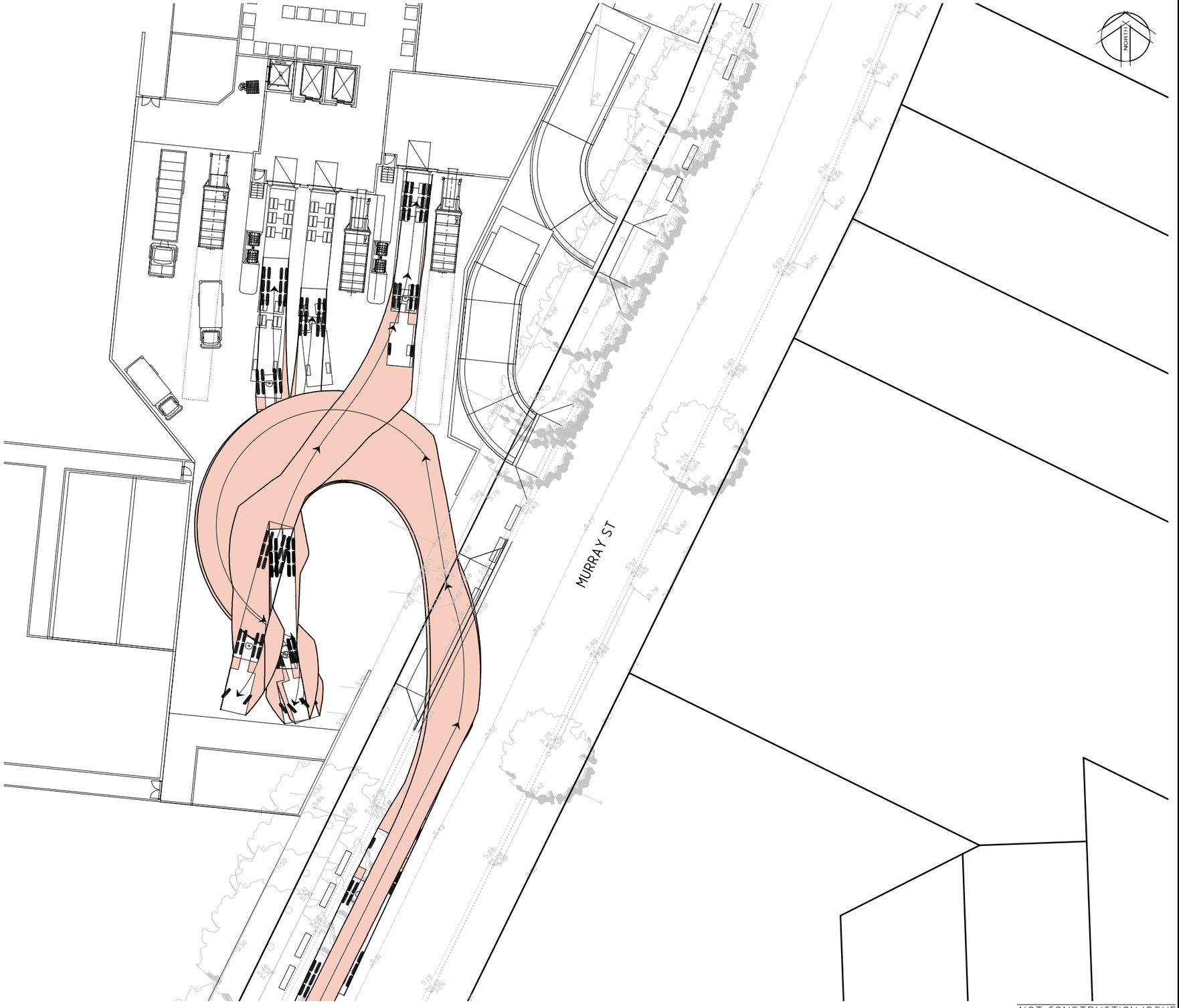

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LOADING DOCK 3 TURNING PATH PLAN

Status: FOR INFORMATION

Date	Datum	Scale	Size
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Drawing Number: 210026-SK-008
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