

CoA E132 – Local Roads Approval

Western Harbour Tunnel and Warringah
Freeway Upgrade

Stage 1A Early and Enabling Works - Critical utility
installation, relocation and protection works

Transport for NSW

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CoA E132 – Local Roads Approval

Western Harbour Tunnel and Warringah Freeway
Upgrade

Stage 1A Early and Enabling Works - Critical
utility installation, relocation and protection works

April 2022

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Document control

Approval

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Signed	
Dated	01/04/2022

Version control

The below document status table is for tracking the revisions of this Document, while the project is in construction. The version control table is to be used to track this Document revisions, including those incorporating changes following agency comments.

It may be modified where necessary to fit with requirements of the individual project.

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8	01/04/2022	Updated to extend duration	JN

Glossary / abbreviations

Abbreviation	Expanded text
CCS	Community Communication Strategy
CoA	Condition of Approval
CPAS	Construction Parking and Access Strategy
CUT	Critical utilities installation, relocation and protection
Document, the	This local roads approval document
DPIE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
HV	Heavy vehicle
Pedestrian desire line	An unplanned route or path that is used by numerous pedestrians to travel from one place to another. An example is a road crossing where there is no formal crossing facility
Project, the	Western Harbour Tunnel Warringah Freeway Upgrade
SPA	Sydney Program Alliance
TfNSW	Transport for NSW
WFU	Warringah Freeway Upgrade
WFUEW	Warringah Freeway Upgrade Early Works
WFUMW	Warringah Freeway Upgrade Main Works
WHT	Western Harbour Tunnel
WHTBL	Western Harbour Tunnel Beaches Link
WHTWFU	Western Harbour Tunnel Warringah Freeway Upgrade

1 Introduction

1.1 Background

The Western Harbour Tunnel and Warringah Freeway Upgrade (WHTWUFU) (the project) forms a core component of the broader Western Harbour Tunnel and Beaches Link (WHTBL) program of works (refer to Figure 1-1 and Figure 1-2). The project comprises two main components:

- A new crossing of Sydney Harbour involving twin tolled motorway tunnels connecting the M4-M5 Link at Rozelle and the Warringah Freeway at North Sydney (the Western Harbour Tunnel)
- Upgrade and integration works along the existing Warringah Freeway, including infrastructure required for connections to the Beaches Link and Gore Hill Freeway Connection project. Reconfiguration works as part of the Warringah Freeway Upgrade would optimise the road corridor and improve the performance of the Sydney Harbour Tunnel, the Sydney Harbour Bridge and the Western Harbour Tunnel.

Due to its importance, the WHTWUFU project was declared to be Critical State Significant Infrastructure (CSSI) by the Minister for Planning and Public Space. On 21 January 2021, Minister for Planning and Public Space approved the construction and operation of the WHTWUFU project (SSI 8863) and the Department of Planning, Industry and Environment (DPIE) issued the NSW Minister for Planning and Public Space's Conditions of Approval (CoA).

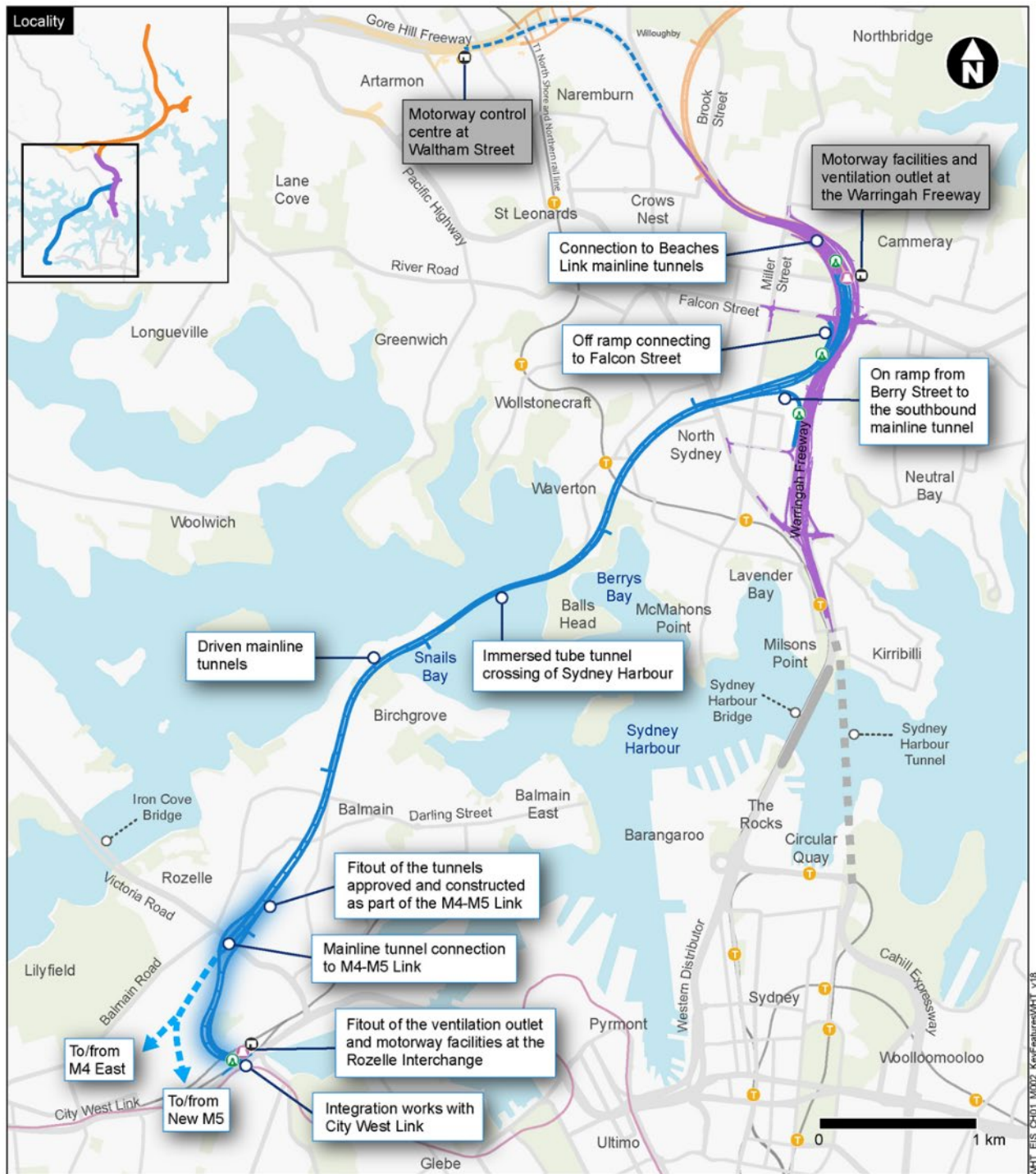
A detailed description of the project is provided in Chapter 5 of the Western Harbour Tunnel and Warringah Freeway Upgrade Environmental Impact Statement (EIS).

The WHTWUFU project will be delivered in numerous stages:

- Stage 1 - Early and enabling works:
 - Stage 1A - Critical utility installation, relocation and protection (CUT) (the subject of this local roads approval document)
 - Stage 1B - Cammeray Golf Course adjustment works (CGC)
- Stage 2 - Warringah Freeway Upgrade project:
 - Stage 2A - Warringah Freeway Upgrade early works (WFUEW)
 - Stage 2B - Warringah Freeway Upgrade main works (WFUMW)
- Stage 3 - Western Harbour Tunnel project (WHT).

Further detail on each stage is provided in the WHTWUFU project Staging Report.

This local roads approval document (this Document) applies only to Stage 1A Early and Enabling Works - Critical utility installation, relocation and protection stage of the project (referred to herein as "the critical utility works" or 'CUT'). The critical utility works will support the delivery program of the Main Works of the project by undertaking these works prior to the commencement of the Main Works.



Legend

Operational features

- Western Harbour Tunnel
- Warringah Freeway Upgrade
- Communications cable for motorway control centre
- M4-M5 Link tunnel fitout and commissioned as part of Western Harbour Tunnel

- ⬆ Surface connection
- ⬆ Permanent operational facility
- ⬆ Ventilation outlet

Connecting projects

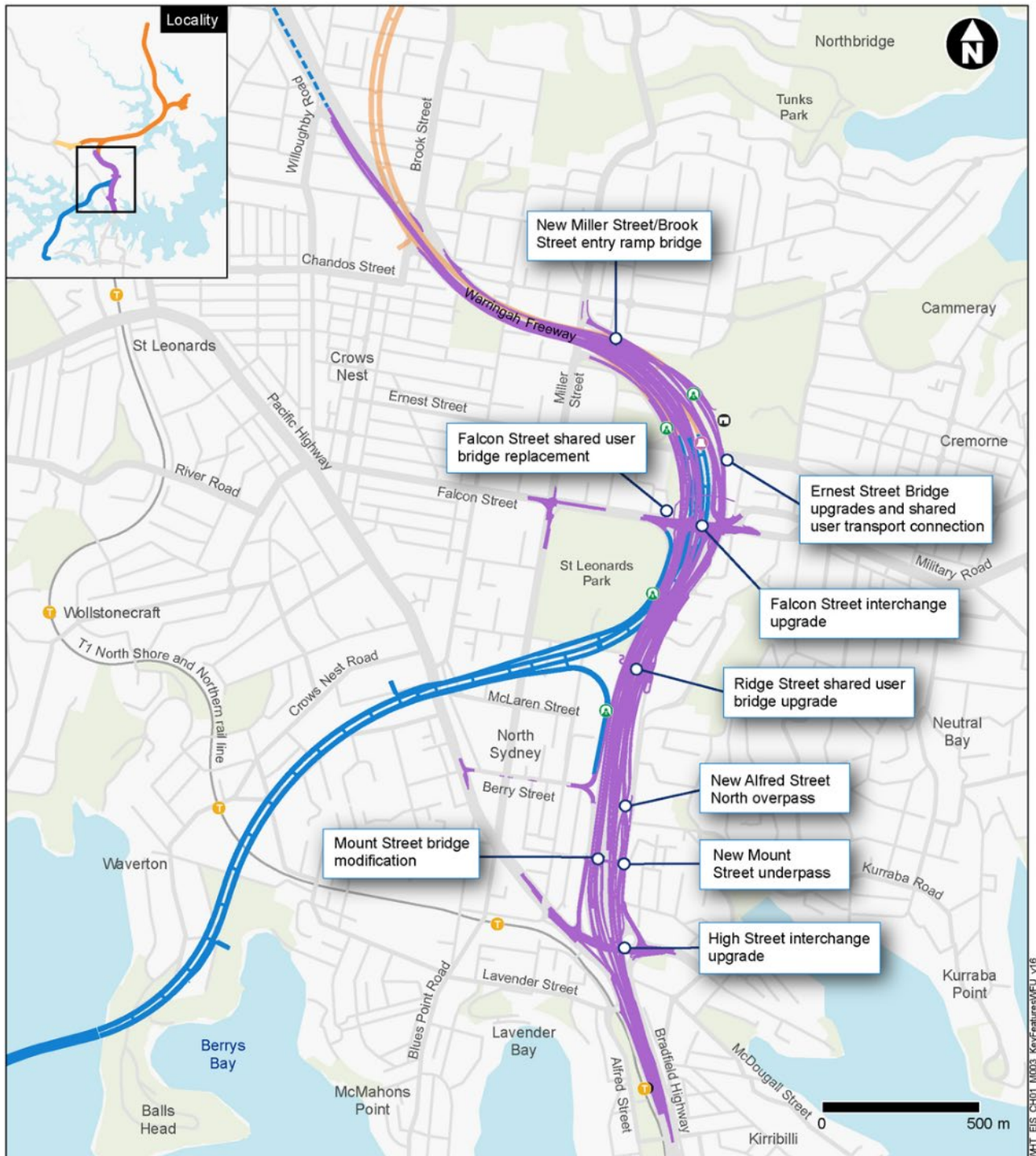
- Beaches Link
- Gore Hill Freeway Connection
- M4-M5 Link connections (indicative)

Existing rail network

- Heavy rail
- Light rail
- T Train station

(Reference: Western Harbour Tunnel and Warringah Freeway Upgrade Environmental Impact Statement, Figure 1-2)

Figure 1-1 Key features of the Western Harbour Tunnel component of the project



Legend

Operational features

- Warringah Freeway Upgrade
- Western Harbour Tunnel
- Communications cable for motorway control centre
- Surface connection
- Permanent operational facility
- Ventilation outlet

Connecting projects

- Beaches Link

Existing rail network

- Heavy rail
- Train station

(Reference: Western Harbour Tunnel and Warringah Freeway Upgrade Environmental Impact Statement, Figure 1-3)

Figure 1-2 Key features of the Warringah Freeway Upgrade component of the project

1.2 Project description

The early and enabling works will support the delivery program of the Main Works of the project by undertaking these works prior to the commencement of the Main Works.

This Document applies only to the critical utility installation, relocation and protection early works package of the project (Stage 1A). These critical utilities works are critical to an earlier start on site and will be undertaken as part of early and enabling works of the project as outlined in Table 1-1 and Figure 1-3.

Table 1-2 provides a summary of the activities which will be completed as part of the critical utility works scope.

The critical utility works will commence in early 2021 and be completed by late 2022. The program for the remaining stages of the WHTWUFU project is included in the WHTWUFU Project Staging Report.

Table 1-1 Critical utilities works

Areas	Key activities
Alfred Street North, Neutral Bay	<ul style="list-style-type: none">• Deviation of existing Sydney Water sewer mains• Relocation of existing Ausgrid assets• Relocation of various communication provider assets
Arthur Street / High Street, North Sydney	<ul style="list-style-type: none">• Relocation of existing Ausgrid assets• Relocation of various communication provider assets• Relocation of two (2) existing Sydney Harbour Tunnel fire hydrant booster stations• Relocation of existing 415V feed to Sydney Harbour Tunnel control room
Cammeray Avenue / Ernest Street / Cammeray Golf Course, Cammeray	<ul style="list-style-type: none">• Relocation of existing in-ground Ausgrid assets• Removal of existing disused in-ground Ausgrid assets• Relocation of existing in-ground Sydney Water assets• Relocation of existing in-ground communication provider assets• Installation of new permanent Intelligent Transport System (ITS) node and temporary connections• Installation of temporary construction power supply along Ernest Street from Ben Boyd Road to the Cammeray Golf Course site (WHT10).

Table 1-2 Description of activities for the critical utility works scope

Activity	Description
Establishment and operation of major ancillary facilities	
Site preparation works	<ul style="list-style-type: none"> • Provision of site security such as temporary fencing and perimeter fencing • Clearing and trimming of vegetation within the construction footprint • Site levelling, grading and compaction (including fill importation), including temporary stockpiling of materials for site levelling • Provision of foundations and buildings for toilet facilities, offices, lunch rooms, signage and pedestrian diversions, and installation of traffic barriers
Site survey and site investigation works	<ul style="list-style-type: none"> • Ground penetrating radar or electromagnetic ground investigation • Utility investigation by potholing with a vacuum truck
Initial environmental controls	<ul style="list-style-type: none"> • Erosion and sediment controls, including: <ul style="list-style-type: none"> ◦ Installation of rip rap ◦ Drainage sump ◦ Diversion of offsite flows ◦ Erosion, sediment and water flow controls ◦ Delineation of sensitive areas and temporary fencing/hoardings
Fit out, commissioning and install of remaining site infrastructure including	<ul style="list-style-type: none"> • Chemical and hazardous material storage • Designated stockpile/laydown areas • Office furniture fit out • Formalisation of on-site car parking (line marking etc.) • Site lighting installed which will involve the use of power saws for cutting steel work
Operation of minor ancillary facilities	<ul style="list-style-type: none"> • Site offices • Lunch sheds • Staff amenities • Off-street car parking • Laydown • Material stockpiling
Critical utilities works	
Installation of services to the site e.g. water, sewer, power, communications	<ul style="list-style-type: none"> • Establish temporary work area including installation of temporary fencing, storage, laydown and stockpiling areas • Installing pre-construction environmental management controls, e.g. sandbags at stormwater drainage outlets • Clearing and trimming of vegetation • Concrete wet saw cutting to remove concrete or asphalt pavement

	<ul style="list-style-type: none"> • Trench excavations • Stockpiling excavated materials within the work area for reuse or removal for off- site disposal • Preparing sub-grade surface (e.g. stabilised sand) to accommodate utility services • Laying utility services either as pipes, cables or conduits • Constructing joint bays and pits (where required) • Pulling feeders and cables through conduits • Connecting utility services to existing networks • Testing and commissioning of utility services • Backfilling trenches and re-instating ground surface to an appropriate condition • Rehabilitate areas disturbed by works • Site clean-up and decommissioning of temporary work areas and environmental management controls
Installation of relocated utilities e.g. water, sewer, power, communications	<ul style="list-style-type: none"> • Establish temporary work area including installation of temporary fencing, storage, laydown and stockpiling areas • Installing pre-construction environmental management controls, e.g. sandbags at stormwater drainage outlets • Clearing and trimming of vegetation • Concrete wet saw cutting to remove concrete or asphalt pavement • Trench excavations • Installation of directional drilling launch/receiving sites • Stockpiling excavated materials within the work area for reuse or removal for off- site disposal • Preparing sub-grade surface (e.g. stabilised sand) to accommodate utility services • Laying utility services either as pipes, cables or conduits • Constructing joint bays and pits (where required) • Pulling feeders and cables through conduits • Connecting utility services to existing networks • Testing and commissioning of utility services • Backfilling trenches and re-instating ground surface to an appropriate condition • Removal of redundant utilities • Rehabilitate areas disturbed by works • Site clean-up and decommissioning of temporary work areas and environmental management controls

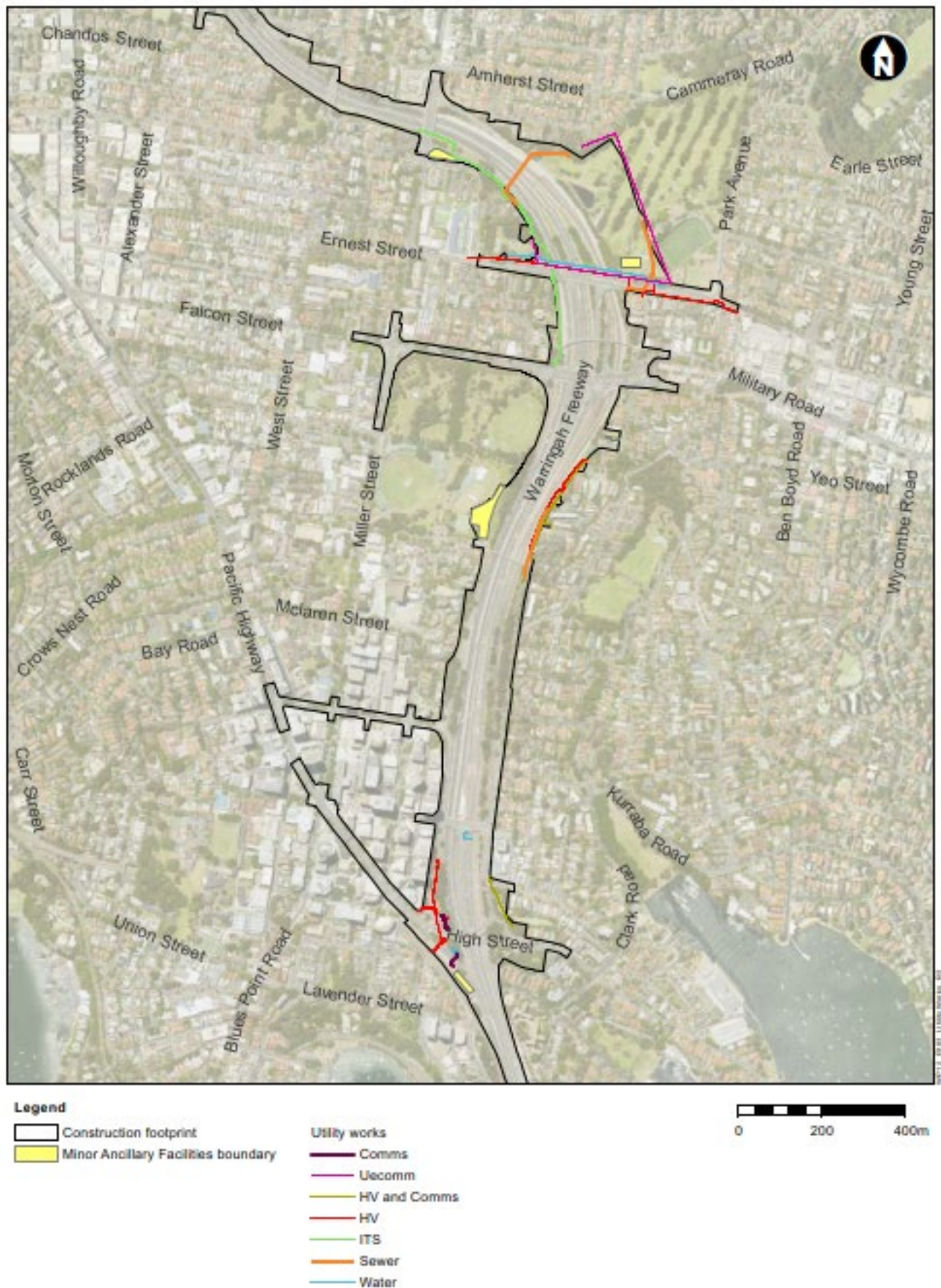


Figure 1-3 Location of critical utility works scope

1.3 Purpose of this local roads approval

This Document has been prepared to describe how Sydney Program Alliance (SPA), during the critical utilities work, will comply with the requirements of the NSW Minister for Planning and Public Space's CoA E132. This Document will be lodged to DPIE for approval prior to heavy vehicles (HV) use of local roads that have not been identified, assessed and approval as part of the EIS.

In accordance with CoA E133, this Document will:

- Include swept path analyses for local roads that require DPIE approval
- Demonstrate that DPIE approval of local roads nominated in this Document will not compromise the safety of pedestrians and cyclists or the safety of two-way traffic flow on two-way roadways
- Provide details related to the date of road dilapidations that have been conducted for local roads that require DPIE approval
- Detail measures that will be implemented to avoid use of nominated local roads past schools, aged care facilities and childcare facilities during peak operation times
- Include advice from an appropriately qualified traffic engineer regarding the suitability of nominated local roads that require DPIE approval.

The requirements of CoA E132 and E133 and where they are addressed in this Document are shown in Table 1-3.

Table 1-3 CoA E132 and E133 compliance

CoA	Requirement	Where addressed in Document
E132	Local roads proposed to be used by heavy vehicles to directly access the construction boundary and ancillary facilities that are not shown in Figure 5-7 to 5-22 inclusive of Appendix F of the EIS must be approved by the Planning Secretary and included in the Traffic, Transport and Access Management CEMP Sub-plan.	This Document Traffic, Transport and Access Management Sub-plan (TTAMP)
E133	All requests to the Planning Secretary under Condition E132 must include the following:	
(a)	include a swept path analysis	Section 3.1
(b)	demonstration that the use of local roads by heavy vehicles for the CSSI will not compromise the safety of pedestrians and cyclists or the safety of two-way traffic flow on two-way roadways	Section 3.2
(c)	provide details as to the date of completion of the road dilapidation surveys for the subject local roads	Section 3.3
(d)	measures that will be implemented to avoid where practicable the use of roads past schools, aged care facilities and child care facilities during their peak operation times	Section 4
(e)	written advice from an appropriately qualified professional on the suitability of the proposed heavy vehicle route which takes into consideration items (a), (b), (c), and (d) of this condition	Appendix A1

2 Local roads proposed for approval

2.1 Identification of local roads

As required by CoA E132, DPIE approval is required for any local roads that have not been identified and assessed in the EIS. Local roads assessed in the EIS and already approved under CoA E132 are detailed in Table 2-1. Local roads requiring DPIE approval under CoA E132 are detailed in Table 2-2.

Table 2-1 Local roads assessed in the EIS and already approved under CoA E132

Local road	Description of use during construction	Description of potential impacts
Cammeray Avenue (within construction footprint)	Utility relocations	Short and long term traffic control setups. Road closures. Period of use: 18 months
Rosalind Street	Access to minor ancillary facility Access to worksite	Changes to parking arrangements Use by construction traffic accessing minor ancillary facility and utilities worksite Period of use: 18 months
Alfred Street North	Access to minor ancillary facility Access to worksite	Changes to parking arrangements Light vehicle access to minor ancillary facility Use by construction traffic accessing utilities worksite Period of use: 18 months
Ridge Street	Access to minor ancillary facility	Changes to parking arrangements Use by construction traffic accessing minor ancillary facility Period of use: 18 months
Whaling Road	Access to worksite	Use by construction traffic accessing utilities worksite Period of use: 18 months
High Street	Access to worksite	Use by construction traffic accessing utilities worksite Period of use: 18 months
Blue Street	Access to minor ancillary facility Access to worksite	Use by construction traffic accessing minor ancillary facility Period of use: 18 months

Table 2-2 Local roads requiring DPIE approval under CoA E132

Local road	Direction of movement	Description of use during construction	Description of potential impacts
Cammeray Avenue	Eastbound Westbound	Utility relocations	Short and long term traffic control setups Road closures. Period of use: 18 months
ANZAC Avenue	Northbound Southbound	Access to work site	Construction vehicle route Period of use: 18 months
Bells Avenue	Northbound Southbound	Access to Cammeray Golf Course	Construction vehicle route Period of use: 18 months
Warringa Road	Southbound	Access to work site	Construction vehicle route Period of use: 18 months
Amherst Street	Eastbound Westbound	Access to work site	Construction vehicle route Period of use: 18 months
Cammeray Road (between Park Avenue and Amherst Street)	Westbound	Access to work site	Use by construction traffic Period of use: 18 months
Park Avenue	Northbound	Access to work site	Use by construction traffic Period of use: 18 months
Merlin Street	Northbound Southbound	Access to worksite	Use by construction traffic accessing utilities worksite Period of use: 18 months
Ben Boyd Road (south of Ernest Street)	Northbound	Access to worksite (refer to Figure 2-2)	Use by construction traffic Period of use: 18 months
Ben Boyd Road (north of Belgrave Street)	Northbound	Egress from worksite (refer to Figure 2-2)	Use by construction traffic Period of use: 18 months
Sutherland Street	Westbound	Egress from worksite (refer to Figure 2-2)	Use by construction traffic Period of use: 18 months

Figure 2-1 presents local roads requiring DPIE approval for use during CUT works. Figure 2-2 shows access and egress routes that provide justification for the use of Ben Boyd Road and Sutherland Street.



Figure 2-1 Local roads requiring approval (Sheet 1)

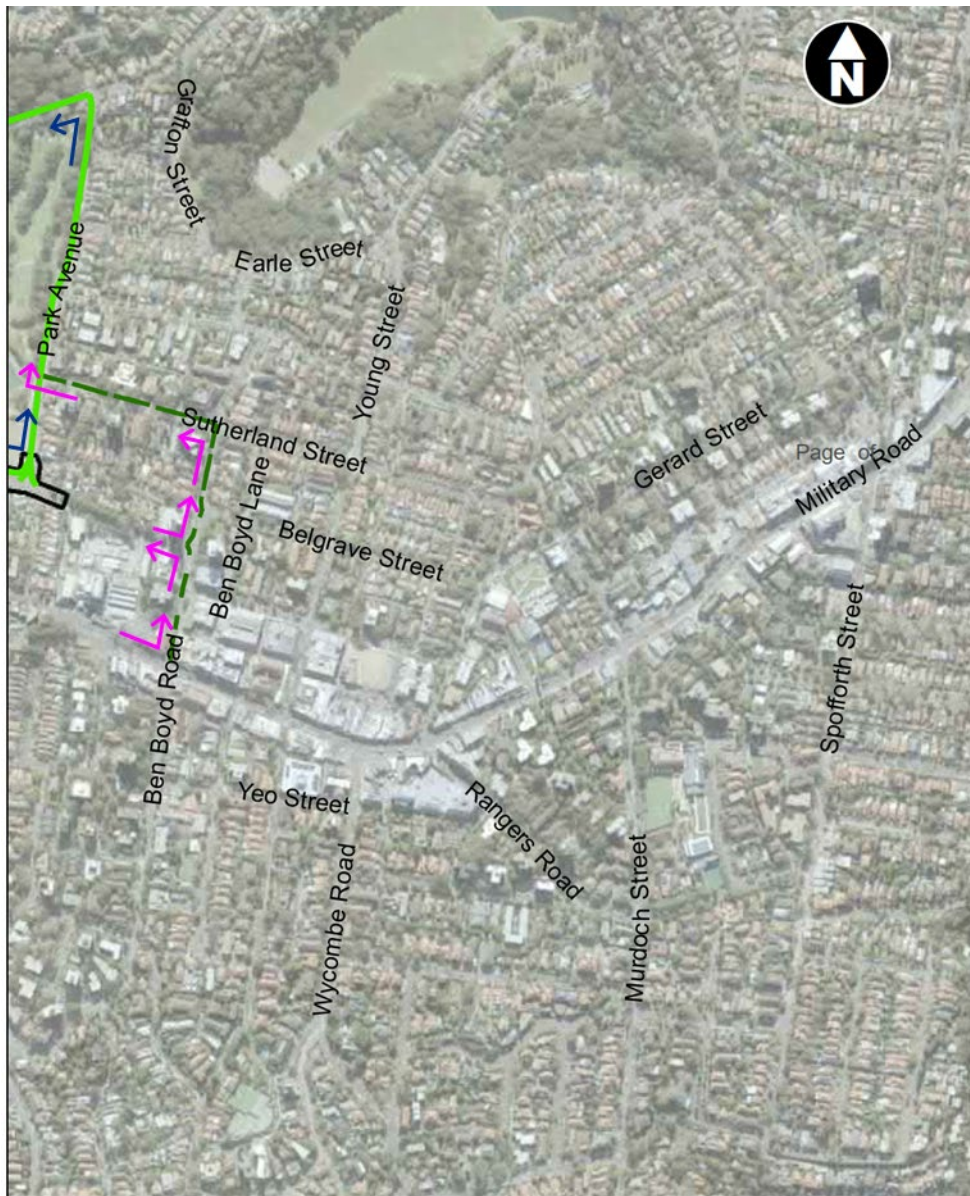


Legend

- Construction support site
- Construction footprint
- Approved local roads

0 100 200m

Figure 2-1 Local roads requiring approval (Sheet 2)



Legend

- Construction support site
- Construction footprint

0 200 400m

- Approved local roads
- Local roads for approval
- ➔ Approved directions for HV movements
- ➔ HV movements for approval

Figure 2-1 Local roads requiring approval (Sheet 3)

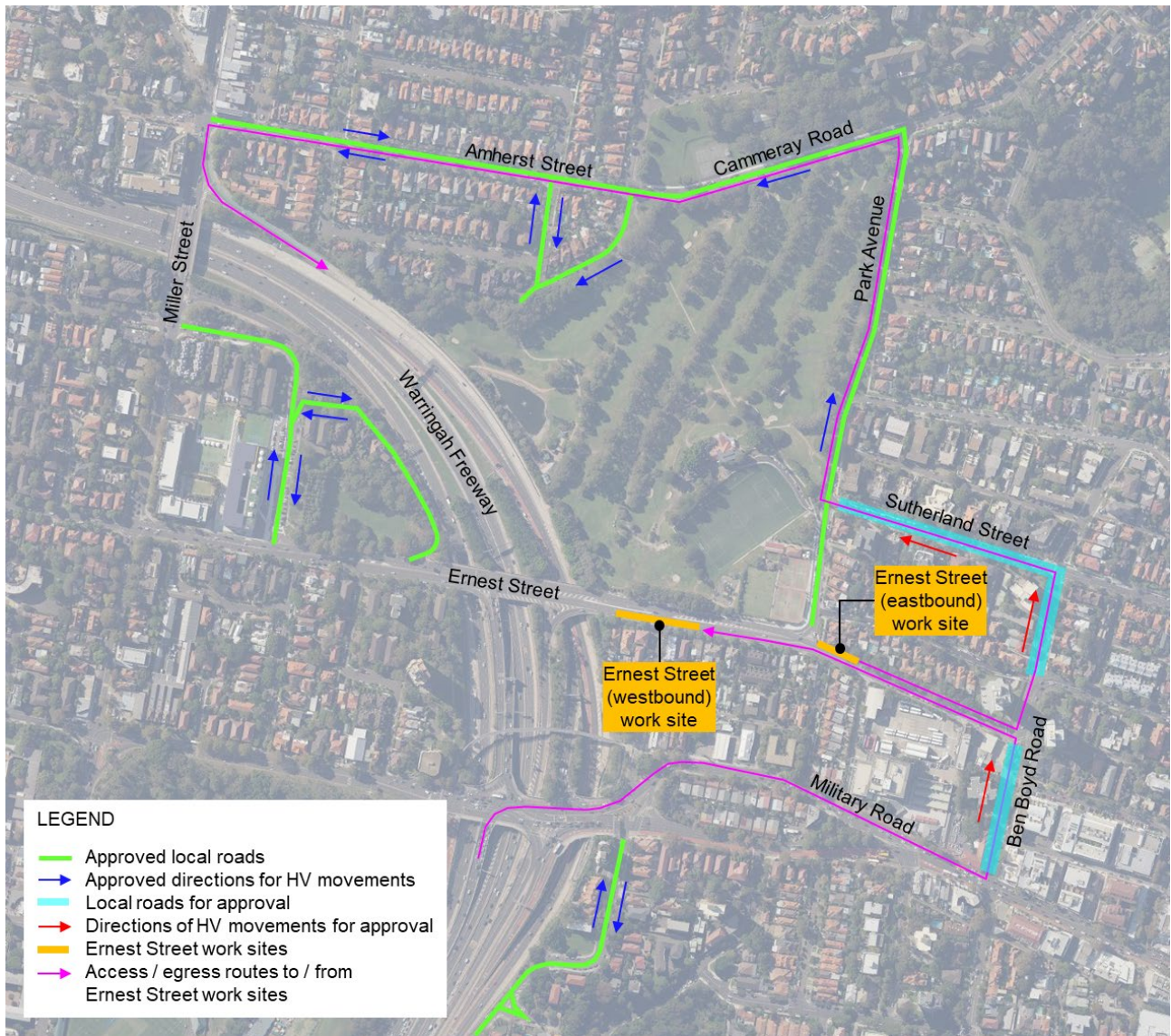


Figure 2 2 Justification for the use of Ben Boyd Road and Sutherland Street (Sheet 1)

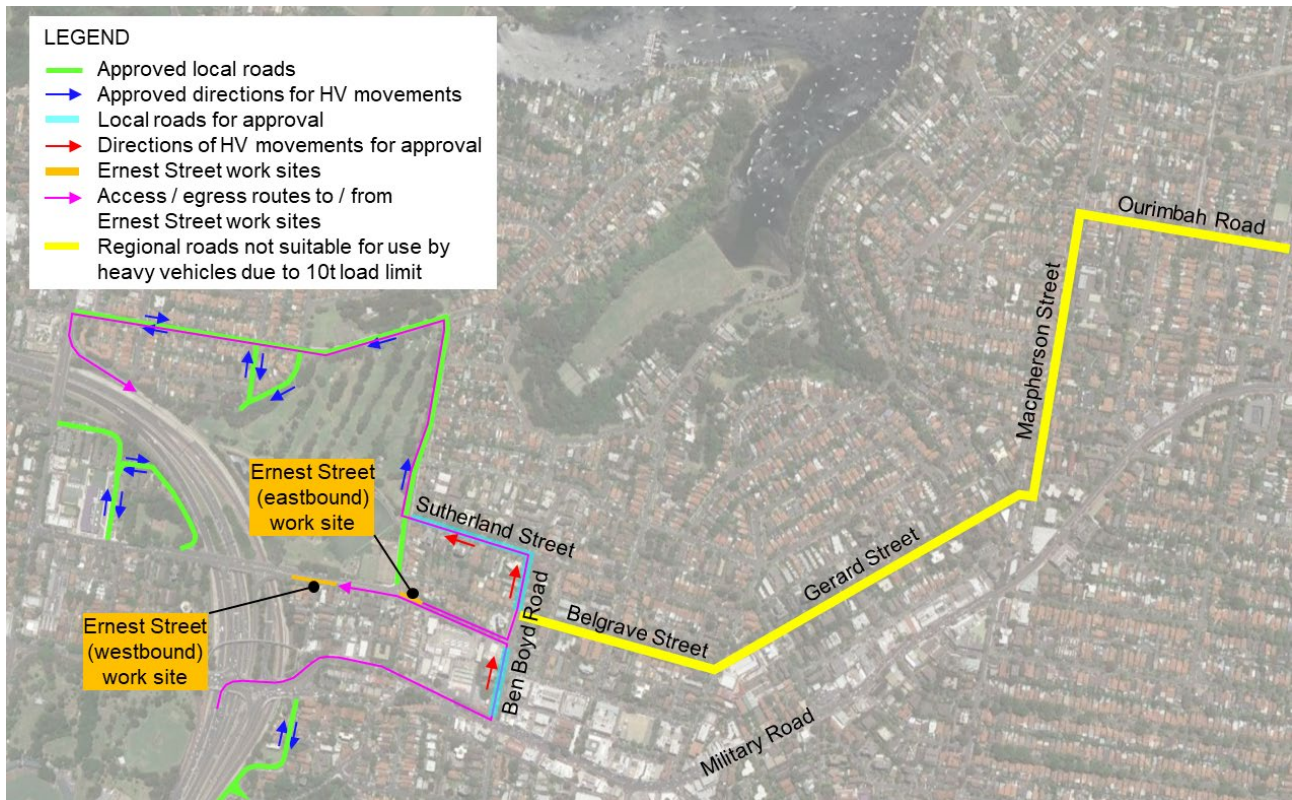


Figure 2-2 Justification for the use of Ben Boyd Road and Sutherland Street (Sheet 2)

2.2 Proposed volumes of heavy vehicles on local roads

Proposed volumes of heavy vehicles on local roads that are assessed in this Document (shown in Figure 2-1) are detailed in Table 2-3.

Table 2-3 Proposed volumes of heavy vehicles on local roads

Local road	Peak vehicle movements per day (two-way movements)	Morning peak vehicle movements (6 am to 10 am) (two-way movements)	Evening peak vehicle movements (3 pm to 7 pm) (two-way movements)
	Heavy	Heavy	Heavy
Cammeray Avenue	50	20	20
ANZAC Avenue	50	20	20
Bells Avenue	70	25	25
Warringa Road	25 (one-way westbound only)	8 (one-way westbound only)	8 (one-way westbound only)
Amherst Street	70	25	25
Cammeray Road (between Park Avenue and Amherst Street)	70 (one-way westbound only)	25 (one-way westbound only)	25 (one-way westbound only)
Park Avenue	80 (one-way northbound)	30 (one-way northbound)	30 (one-way northbound)
Merlin Street	40 (20x semi-trailers)	15 (4x semi-trailers)	15 (4x semi-trailers)
Ben Boyd Road (south of Ernest Street)	10 (one-way northbound only)	4 (one-way northbound only)	4 (one-way northbound only)
Ben Boyd Road (north of Belgrave Street)	10 (one-way northbound only)	4 (one-way northbound only)	4 (one-way northbound only)
Sutherland Street	10 (one-way northbound only)	4 (one-way northbound only)	4 (one-way northbound only)

2.3 Justification for the use of local roads

Justification for the selection of local roads that are assessed in this Document (shown in Figure 2-1) is provided in Table 2-4.

Table 2-4 Justification for the selection of local roads

Local road	Justification
<ul style="list-style-type: none"> Amherst Street, Cammeray Bells Avenue, Cammeray Cammeray Road, Cammeray 	<ul style="list-style-type: none"> Forms part of the shortest route between the Cammeray Golf Course (north) site and the Ridge Street minor ancillary facility (via Miller Street) The use of other local roads would result in a more circuitous route and impact a greater number of residential properties and sensitive receivers
<ul style="list-style-type: none"> Park Avenue, Cammeray Warringa Road, Cammeray 	<ul style="list-style-type: none"> Forms part of the shortest route between the Bells Avenue site and the nearest arterial road (Ernest Street) for access to the Sydney motorway network There is no alternative route to access the Bells Avenue site
<ul style="list-style-type: none"> Cammeray Avenue, Cammeray ANZAC Avenue, Cammeray 	<ul style="list-style-type: none"> Forms part of the shortest route between the Cammeray Avenue site and the nearest arterial road (Ernest Street) for access to the Sydney motorway network The use of southbound ANZAC Avenue instead of Rosalind Street for access to the arterial road network is not possible for the following reasons: <ul style="list-style-type: none"> Sight distance issues for vehicles making the u-turn movement from Cammeray Avenue to Rosalind Street A 12.5-metre single unit truck would not be able to make the u-turn movement from Cammeray Avenue to Rosalind Street There will be times when Cammeray Avenue is closed to northbound traffic. At these times, northbound ANZAC Avenue movements will be required to access the Cammeray Avenue work site.
<ul style="list-style-type: none"> Merlin Street, Neutral Bay 	<ul style="list-style-type: none"> Forms part of the shortest route between the Alfred Street North worksite and the nearest arterial road (Falcon Street) for access to the Sydney motorway network The use of other local roads would result in a more circuitous route and impact a greater number of residential properties and sensitive receivers
<ul style="list-style-type: none"> Ben Boyd Road (south of Ernest Street), Neutral Bay 	<ul style="list-style-type: none"> Forms part of the shortest route between the arterial road network (Military Road) and the Ernest Street (westbound) worksite for access from the Sydney motorway network There is a 10-tonne load limit on Belgrave Street, Gerard Street, Macpherson Street and Ourimbah Road. This means heavy vehicles cannot travel from Military Road to the Ernest Street (westbound) worksite via these regional roads

Local road	Justification
	<ul style="list-style-type: none"> The use of other local roads would impact a greater number of residential properties and sensitive receivers
<ul style="list-style-type: none"> Ben Boyd Road (north of Belgrave Street), Cremorne Sutherland Street, Cremorne 	<ul style="list-style-type: none"> Forms part of the shortest route between the Ernest Street (eastbound) worksite (east of Park Avenue) and the nearest arterial road (Miller Street southbound) for access to the Sydney motorway network There is a 10-tonne load limit on Belgrave Street, Gerard Street, Macpherson Street and Ourimbah Road. This means heavy vehicles cannot travel from the Ernest Street (eastbound) worksite (east of Park Avenue) to Military Road via these regional roads The use of other local roads would result in a more circuitous route and impact a greater number of residential properties and sensitive receivers

3 Local roads assessment

3.1 Swept path analysis

As required by CoA E133(a), swept paths have been prepared for all local roads requiring DPIE approval. Swept path diagrams are provided in Appendix A2 for:

- A 12.5-metre single unit truck, which is the maximum size vehicle that will be used for most of the CUT works
- A 19-metre semi-trailer on Merlin Street, which will be required for works on Alfred Street North
- An 8.8-metre single unit truck, which is the maximum size vehicle that can travel on Ben Boyd Road (north of Belgrave Street) and Sutherland Street given existing geometric constraints at intersections.

The swept paths provided in Appendix A2 are detailed in Table 3-1.

Table 3-1 Summary of swept path analysis

Local road	Drawing number in Appendix A2	Can 8.8 m single unit truck / 12.5 m single unit truck / 19 m semi-trailer make movement without encroaching on existing kerbs, traffic management / traffic control devices or on-street parking spaces?	Additional comments
Amherst Street and Bellevue Street	Appendix A-1	12.5 m single unit truck – yes	N/A
Amherst Street to Bells Avenue	Appendix A-2	12.5 m single unit truck – yes	N/A
Bells Avenue to Amherst Street	Appendix A-3	12.5 m single unit truck – yes	N/A
Cammeray Road and Park Avenue	Appendix A-4	12.5 m single unit truck – yes	N/A
Amherst Street, Cammeray Road and Warringa Road	Appendix A-5	12.5 m single unit truck – yes	N/A
Ernest Street and Park Avenue	Appendix A-6	12.5 m single unit truck – yes	N/A
Miller Street and Amherst Street	Appendix A-7	12.5 m single unit truck – yes	N/A
Ernest Street and Cammeray Avenue	Appendix A-8A Appendix A-8B	12.5 m single unit truck – yes	N/A

Local road	Drawing number in Appendix A2	Can 8.8 m single unit truck / 12.5 m single unit truck / 19 m semi-trailer make movement without encroaching on existing kerbs, traffic management / traffic control devices or on-street parking spaces?	Additional comments
Cammeray Avenue and ANZAC Avenue	Appendix A-9A, Appendix A-9B	12.5 m single unit truck – yes	N/A
Ernest Street and ANZAC Avenue	Appendix A-10A, Appendix A-10B, Appendix A-10C, Appendix A-10D, Appendix A-10E	Left turn from ANZAC Avenue to Ernest Street for a 12.5 single unit truck– no (shown in Appendix A-10A and Appendix A-10B) Right turn from ANZAC Avenue to Ernest Street for a 12.5 single unit truck – yes (shown in Appendix A-10C)	A 12.5-metre single unit truck would not be able to make the left-turn movement without encroaching on the existing kerb and keep within its own lane (refer to drawing Appendix A-10A). In order for a 12.5-metre single unit truck to make this movement without encroaching on an existing kerb, it would need to use part of the northbound lane (refer to drawing Appendix A-10B). This is considered a safety hazard and therefore all trucks will be required to turn right from ANZAC Avenue to Ernest Street (refer to drawing Appendix A-10C).
		Left turn from Ernest Street to ANZAC Avenue for a 12.5 single unit truck – no (shown in Appendix A-10D)	A 12.5-metre single unit truck would not be able to make the left-turn movement without encroaching on the existing kerb and keep within its own lane. In order for a 12.5-metre single unit truck to make this movement without encroaching on an existing kerb, it would need to use part of
		Right turn from Ernest Street to ANZAC Avenue for a 12.5 single unit truck – yes (shown in Appendix A-10E)	

Local road	Drawing number in Appendix A2	Can 8.8 m single unit truck / 12.5 m single unit truck / 19 m semi-trailer make movement without encroaching on existing kerbs, traffic management / traffic control devices or on-street parking spaces?	Additional comments
			the southbound lane (refer to drawing Appendix A-10D). This is considered a safety hazard and therefore all trucks will be required to turn right from Ernest Street to ANZAC Avenue (refer to Appendix A-10E).
Merlin Street and Falcon Street	Appendix A-11A, Appendix A-11B	12.5 m single unit truck – yes (shown in Appendix A-11A) 19 m semi-trailer – yes (shown in Appendix A-11B)	A 19m semi-trailer is required for asphaltting works on Alfred Street North, with vehicles to exit the work site via Merlin Street for access to Falcon Street. Asphaltting works are associated with “backfilling trenches and re-instating ground surface to an appropriate condition” and “rehabilitate areas disturbed by works” as described in Table 1-2.
Alfred Street North and Merin Street	Appendix A-12A, Appendix A-12B, Appendix A-12C	12.5 m single unit truck – yes (shown in Appendix A-12A) 19 m semi-trailer while staying within the northbound / eastbound lane – no (shown in Appendix A-12B) 19 m semi-trailer with use of the southbound / westbound lane – yes (shown in Appendix A-12C)	A 19-metre semi-trailer would not be able to negotiate the bend at the interface between Alfred Street North and Merlin Street while staying within the northbound / eastbound lane without encroaching on an existing kerb or existing on-street parking spaces (refer to drawing Appendix A-12B). In order for a

Local road	Drawing number in Appendix A2	Can 8.8 m single unit truck / 12.5 m single unit truck / 19 m semi-trailer make movement without encroaching on existing kerbs, traffic management / traffic control devices or on-street parking spaces?	Additional comments
			19-metre semi-trailer to make this movement without encroaching on an existing kerb or existing on-street parking spaces, it would need to use the southbound / westbound lane (refer to drawing Appendix A-12C). Traffic controllers are proposed to manage the safe movement of semi-trailers (refer to Section 4).
Military Road and Ben Boyd Road	Appendix A-13	12.5 m single unit truck – yes	N/A
Ernest Street and Ben Boyd Road	Appendix A-14A Appendix A-14B	12.5 m single unit truck – yes	N/A
Ben Boyd Road and Sutherland Street	Appendix A-15A Appendix A-15B	12.5 m single unit truck – no (shown in Appendix A-15A) 8.8 m single unit truck – yes (shown in Appendix A-15B)	A 12.5-metre single unit truck would not be able to make the left-turn movement without encroaching on the existing kerb and keep within its own lane. In order for a 12.5-metre single unit truck to make this movement without encroaching on an existing kerb, it would need to use part of the eastbound lane (refer to drawing Appendix A-15A). This is considered a safety hazard and therefore the maximum truck size will be limited to 8.8

Local road	Drawing number in Appendix A2	Can 8.8 m single unit truck / 12.5 m single unit truck / 19 m semi-trailer make movement without encroaching on existing kerbs, traffic management / traffic control devices or on-street parking spaces?	Additional comments
			metres (refer to Appendix A-15B).
Park Avenue and Sutherland Street	Appendix A-16A Appendix A-16B Appendix A-16C	Left turn from Park Avenue to Sutherland Street for a 12.5 m single unit truck – no (shown in Appendix A-16A) Left turn from Park Avenue to Sutherland Street for an 8.8 m single unit truck – no (shown in Appendix A-16B) Right turn from Park Avenue to Sutherland Street for an 8.8 m single unit truck – yes (shown in Appendix A-16C)	An 8.8-metre or 12.5-metre single unit truck would not be able to make the left-turn movement without encroaching on the existing kerb and keep within its own lane. In order for an 8.8-metre or 12.5-metre single unit truck to make this movement without encroaching on an existing kerb, it would need to use part of the northbound lane (refer to drawing Appendix A-16A and Appendix A-16-B). This is considered a safety hazard and therefore all trucks will be required to turn right from Park Avenue to Sutherland Street (refer to Appendix A-16C).

3.2 Pedestrian, cyclist and two-way traffic flow safety risk assessment

As required by CoA E133(b), a pedestrian, cyclist and two-way traffic flow safety risk assessment has been undertaken to demonstrate that the use of local roads by heavy vehicles will not compromise pedestrian, cyclist and two-way traffic flow safety.

Existing potential hazards to pedestrians, cyclists and two-way traffic were identified during site inspections. These were assessed against a risk matrix. The risks of these potential hazards were then reassessed, taking into consideration the use of local roads by heavy vehicles.

The methodology of identifying hazards and assessing their level of risk is similar to that undertaken for road safety audits. The risk assessment system is the easiest means of identifying the level of risk associated with any given hazard. The risk assessment system is outlined in Appendix A3.

The pedestrian, cyclist and two-way traffic flow safety risk assessment is detailed in Table 3-2 below. Potential hazards to cyclists have been identified where there is an existing designated cycle route (Amherst Street, Cammeray Road, Warringa Road and ANZAC Avenue). The results of the safety risk assessment demonstrate that the use of local roads by heavy vehicles will not have an impact on pedestrian, cyclist and two-way traffic flow safety as indicated by the revised level of risk being the same as the existing level of risk for all identified potential hazards.

Table 3-2 Pedestrian, cyclist and two-way traffic flow safety risk assessment

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Amherst Street westbound approach to Bellevue Street, Cammeray	There is the potential for conflict between cyclists and vehicles where the cycle lane and traffic lane converge on approach to the roundabout	Occasional	Minor	Medium	<ul style="list-style-type: none"> Heavy vehicles would travel at lower speed in the westbound direction due to the uphill grade Existing low numbers of cyclists Signage to warn cyclists (and other vehicles) of the presence of heavy vehicles Driver induction process to include safety awareness in relation to all road users 	Occasional	Minor	Medium
Amherst Street (both directions), Cammeray	There is the potential for conflict between cyclists and vehicles travelling in the same direction on Amherst Street as they share the same road space	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing low numbers of cyclists Signage to warn cyclists (and other vehicles) of the presence of heavy vehicles Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Amherst Street, Cammeray	There is the potential for conflict between pedestrians crossing Amherst Street and vehicles travelling on Amherst Street	Improbable	Serious	Medium	<ul style="list-style-type: none"> • Presence of pedestrian refuge islands on the approaches to Bellevue Street, Echo Street / Bells Avenue and Warringa Road • Existing low numbers of pedestrians • Existing 50 km/h posted speed limit • Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Amherst Street, Cammeray	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Amherst Street	Improbable	Serious	Medium	<ul style="list-style-type: none"> • Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths • Existing low numbers of pedestrians • Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Bells Avenue, Cammeray	There is the potential for conflict between pedestrians crossing Bells Avenue and vehicles travelling on Bells Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing low numbers of pedestrians Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Bells Avenue, Cammeray	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Bells Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Existing low numbers of pedestrians Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Cammeray Road, Cammeray	There is the potential for conflict between cyclists and vehicles travelling in the same direction on Cammeray Road as they share the same road space	Improbable	Serious	Medium	<ul style="list-style-type: none"> There is an existing separated shared path on the northern side of Cammeray Road Existing low numbers of cyclists Signage to warn cyclists (and other vehicles) of the presence of heavy vehicles Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Cammeray Road, Cammeray	There is the potential for conflict between pedestrians crossing Cammeray Road and vehicles travelling on Cammeray Road	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing lack of pedestrian desire lines across Cammeray Road Existing low numbers of pedestrians Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Cammeray Road, Cammeray	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Cammeray Road	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Existing low numbers of pedestrians Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Park Avenue (northbound between Ernest Street and Cammeray Road), Cammeray	There is the potential for conflict between cyclists and vehicles travelling in the same direction on Park Avenue as they share the same road space	Improbable	Serious	Medium	<ul style="list-style-type: none"> There is an existing separated cycleway on the western side of Park Avenue south of Sutherland Street Existing low numbers of cyclists Signage to warn cyclists (and other vehicles) of the presence of heavy vehicles Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Park Avenue (northbound between Ernest Street and Cammeray Road), Cammeray	There is the potential for conflict between pedestrians crossing Park Avenue and vehicles travelling on Park Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing lack of pedestrian desire lines across the majority of Park Avenue Existing low numbers of pedestrians Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Park Avenue (northbound between Ernest Street and Cammeray Road), Cammeray	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Park Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Existing low numbers of pedestrians Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Warringa Road, Cammeray	There is the potential for conflict between cyclists and vehicles travelling in the same direction on Warringa Road as they share the same road space	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing low numbers of cyclists Signage to warn cyclists (and other vehicles) of the presence of heavy vehicles Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Warringa Road, Cammeray	There is the potential for conflict between pedestrians crossing Warringa Road and vehicles travelling on Warringa Road	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing lack of pedestrian desire lines across Warringa Road Existing low numbers of pedestrians Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Warringa Road, Cammeray	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Warringa Road	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Existing low numbers of pedestrians Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Cammeray Avenue, Cammeray	There is the potential for conflict between pedestrians crossing Cammeray Avenue and vehicles travelling on Cammeray Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing lack of pedestrian desire lines across Cammeray Avenue Existing low numbers of pedestrians (outside of school hours) Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Cammeray Avenue, Cammeray	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Cammeray Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Existing low numbers of pedestrians Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
ANZAC Avenue, Cammeray	There is the potential for conflict between cyclists and vehicles travelling in the same direction on ANZAC Avenue as they share the same road space	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing low numbers of cyclists Signage to warn cyclists (and other vehicles) of the presence of heavy vehicles Existing 50 km/h posted speed limit (40 km/h during school zone times) Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
ANZAC Avenue, Cammeray	There is the potential for conflict between pedestrians crossing ANZAC Avenue and vehicles travelling on ANZAC Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Heavy vehicles will not be permitted to travel to or from the Cammeray Avenue worksite via ANZAC Avenue during school zone times on school days (8 am to 9.30 am and 2.30 pm to 4 pm) All heavy vehicles will be required to turn right from ANZAC Avenue to Ernest Street Existing low numbers of pedestrians (outside of school hours) Existing 50 km/h posted speed limit (40 km/h during school zone times) Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
ANZAC Avenue, Cammeray	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using ANZAC Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Heavy vehicles will not be permitted to travel to or from the Cammeray Avenue worksite via ANZAC Avenue during school zone times on school days (8 am to 9.30 am and 2.30 pm to 4 pm) Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths if turning right from ANZAC Avenue to Ernest Street All heavy vehicles will be required to turn right from ANZAC Avenue to Ernest Street Existing low numbers of pedestrians (outside of school hours) Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Merlin Street, Neutral Bay	There is the potential for conflict between pedestrians crossing Merlin Street and vehicles travelling on Merlin Street	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing lack of pedestrian desire lines across Merlin Street Existing low numbers of pedestrians Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Merlin Street, Neutral Bay	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Merlin Street	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Existing low numbers of pedestrians Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Ben Boyd Road (south of Ernest Street), Neutral Bay	There is the potential for conflict between pedestrians crossing Ben Boyd Road and vehicles travelling on Ben Boyd Road	Improbable	Serious	Medium	<ul style="list-style-type: none"> Signalised pedestrian crossings of Ben Boyd Road at Military Road and Ernest Street Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Ben Boyd Road (south of Ernest Street), Neutral Bay	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Ben Boyd Road	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Signalised pedestrian crossings of Ben Boyd Road at Military Road and Ernest Street Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Ben Boyd Road (north of Belgrave Street), Cremorne	There is the potential for conflict between pedestrians crossing Ben Boyd Road and vehicles travelling on Ben Boyd Road	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing lack of pedestrian desire lines across Ben Boyd Road Existing low numbers of pedestrians Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Ben Boyd Road (north of Belgrave Street), Cremorne	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Ben Boyd Road	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Existing low numbers of pedestrians Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Sutherland Street, Cremorne	There is the potential for conflict between cyclists and vehicles travelling in the same direction on Sutherland Street as they share the same road space	Improbable	Serious	Medium	<ul style="list-style-type: none"> There is an existing separated shared path on the northern side of Sutherland Street Existing low numbers of cyclists Signage to warn cyclists (and other vehicles) of the presence of heavy vehicles Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Sutherland Street, Cremorne	There is the potential for conflict between pedestrians crossing Sutherland Street and vehicles travelling on Sutherland Street	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing lack of pedestrian desire lines across Sutherland Street Existing low numbers of pedestrians Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Sutherland Street, Cremorne	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Sutherland Street	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Existing low numbers of pedestrians Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Park Avenue (southbound south of Sutherland Street), Cremorne	There is the potential for conflict between cyclists and vehicles travelling in the same direction on Park Avenue as they share the same road space	Improbable	Serious	Medium	<ul style="list-style-type: none"> There is an existing separated cycleway on the western side of Park Avenue south of Sutherland Street Existing low numbers of cyclists Signage to warn cyclists (and other vehicles) of the presence of heavy vehicles Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
Park Avenue (southbound south of Sutherland Street), Cremorne	There is the potential for conflict between pedestrians crossing Park Avenue and vehicles travelling on Park Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Existing low numbers of pedestrians Existing 50 km/h posted speed limit Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium
Park Avenue (southbound south of Sutherland Street), Cremorne	There is the potential for conflict between heavy vehicles undertaking turning manoeuvres and pedestrians using Park Avenue	Improbable	Serious	Medium	<ul style="list-style-type: none"> Swept path analysis shows heavy vehicles undertaking turning manoeuvres would not encroach on footpaths Existing low numbers of pedestrians Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

Location	Description of existing hazard	Existing conditions			Use of local roads by heavy vehicles			
		Crash frequency	Crash severity	Level of risk	Mitigating factors	Revised crash frequency	Revised crash severity	Revised level of risk
All local roads	There is the potential for side-swipe and head-on crashes between two vehicles travelling in opposite directions on two-way roads	Improbable	Serious	Medium	<ul style="list-style-type: none"> Road widths are sufficient for two heavy vehicles to pass each other Existing 50 km/h posted speed limit (40 km/h during school zone times on ANZAC Avenue) Driver induction process to include safety awareness in relation to all road users 	Improbable	Serious	Medium

3.3 Details of road dilapidation surveys undertaken

As required by CoA E133(c), road dilapidation surveys have been undertaken on all local roads requiring DPIE approval. The road dilapidation surveys were completed on 20 February 2021. These road dilapidations were provided to North Sydney Council for information in accordance with CoA E136.

4 Mitigation measures

As required by CoA E133(d), measures are required to be implemented to avoid where practicable the use of roads past schools, aged care facilities and child care facilities during their peak operation times. To mitigate any potential impacts:

- Heavy vehicles will not be permitted to travel to or from the Cammeray Avenue worksite via ANZAC Avenue during school zone times on school days (8 am to 9.30 am and 2.30 pm to 4 pm)
- All heavy vehicles will be required to turn right from ANZAC Avenue to Ernest Street, and to turn right from Ernest Street to ANZAC Avenue, which will be included in the vehicle movement plan for the Cammeray Avenue worksite
- To safely maintain two-way traffic flow on Cammeray Avenue, traffic controllers will be positioned at both ends of the east-west section of Cammeray Avenue to ensure only one vehicle can travel along Cammeray Avenue at the one time. Traffic controllers will be deployed during construction hours when heavy vehicle movements are occurring
- To safely manage the movement of 19-metre semi-trailers in the northbound / eastbound direction on Merlin Street, traffic controllers will be positioned at the intersection of Alfred Street North / Wyagdon Street and at the southern end of the north-south section of Merlin Street to ensure no other vehicles can travel on Merlin Street during movements of 19-metre semi-trailers. Traffic controllers will be deployed during construction hours when heavy vehicle movements are occurring
- For heavy vehicles egressing from the Ernest Street (eastbound) worksite (east of Park Avenue), the maximum size of heavy vehicle that will be permitted to travel on Ben Boyd Road (north of Belgrave Street) and Sutherland Street is an 8.8-metre single unit truck
- All heavy vehicles will be required to turn right from Sutherland Street to Park Avenue
- Vehicle movement plans showing approved routes and vehicle sizes to and from each origin and destination will be issued to all subcontractors as part of contract documentation upon engagement. Signage will also be installed along approved routes to guide heavy vehicle drivers
- An additional crossing supervisor will be positioned at the zebra crossing on ANZAC Avenue to supplement the existing school crossing supervisor. The additional crossing supervisor will be present from 6.30 am to 10.30 am, and 2 pm to 6 pm on school days. The purpose of the additional crossing supervisor is to manage the movement of pedestrians across ANZAC Avenue
- Heavy vehicle movements on Warringa Road will be restricted to two movements per hour in the westbound direction. In the unlikely event that heavy vehicle movements on Warringa Road exceed two movements per hour, traffic controllers will be deployed at both ends of Warringa Road to manage the movement of heavy vehicles and general traffic to avoid conflict. Traffic controllers will be deployed during construction hours when heavy vehicle movements are occurring
- Signage will be installed on cyclist routes to warn cyclists (and other vehicles) of the presence of heavy vehicles
- Implementation of a Driver's Code of Conduct (refer to Appendix A4)
- The driver induction process will include safety awareness in relation to all road users (including pedestrians and cyclists) and the strict requirement to obey all road rules and to travel only on approved roads (refer to Section 3.5 of the CEMP)
- Community consultation will be undertaken in accordance with the Community Communication Strategy (CCS). This will include engagement activities such as:

- Fact sheets showing overall impacts in the area which will include traffic detours, loss of on-street parking
- Maps showing traffic diversions/parking impacts
- Property access plans to discuss impacts of detours on individual properties
- Detour specific notifications
- Doorknocks for impacted properties to understand access requirements
- Coordination meetings between SPA, TfNSW, Transport Management Centre and Customer Journey Planning – Operations will occur on a regular basis throughout the delivery of the CSSI. Key issues for discussion at the coordination meetings will include road occupancy licences and any other transport network changes or impacts resulting from construction of the CSSI
- Continuous review and improvement will be undertaken (refer to Section 3.12 of the CEMP). This CoA E132 local roads approval document will be reviewed and updated as required:
 - Following reportable environmental incidents
 - Upon identification of new 'significant' risks, including risks identified during risk register updates
 - When non-compliances are identified
 - When the root cause of incident or non-conformance is identified as part of the investigation
 - In response to significant project change (including modifications to the CSSI)
 - Within one month of any of the above occurrences
 - As part of a continuous improvement process
 - The effect of changes in standards and legislation.
- Regular monitoring of mitigation measures for compliance and effectiveness will be undertaken (refer to Section 3.9 of the CEMP). Further detail on regular inspections is detailed in Section 4.1 below.

4.1 Inspections

In accordance with Section 7.1 of the TTAMP SPA will undertake regular inspections to ensure the safety of all traffic movements, as well as the wellbeing of pedestrians, cyclists, drivers and property through and surrounding all worksites. The responsibility and frequency of inspections is stipulated in section 6.1 of the TfNSW Traffic Control at Worksites Manual.

These regular inspections will also verify the on-street parking commitments established by the 'Driver Code of Conduct'.

Three main types of inspections and records will occur:

- Inspections of short-term (single shift) traffic controls during the shift
- Regular daytime inspections of long-term traffic controls after implementation
- Regular night time inspections of long-term traffic controls after implementation.

Pre-opening inspections will be carried out by the Traffic Manager before the start of each new temporary roadwork site or major modification.

Any signage or devices identified during the checks or audits requiring attention will either be rectified at the time or advised to the Traffic Manager during that shift for follow-up action.

Appendix A1 Advice regarding the suitability of local roads as proposed heavy vehicle routes

MEMORANDUM

0242 WP12 SPA WFU Early Works
Sydney Program Alliance

Memo Title	Suitability of proposed heavy vehicle routes on local roads
Recipient	Sydney Program Alliance
Prepared by	Phillip Truong
Revision	F
Date	30 September 2021

1. Introduction

This memo provides advice on the suitability of proposed heavy vehicle routes for the Stage 1A Early and Enabling Works – Critical utility installation, relocation and protection in accordance with the NSW Minister for Planning and Public Space’s Conditions of Approval (CoA) E133(e). The advice is based on Revision 7 of the CoA E132 – Local Roads Approval document, which has been updated to include:

- The movement of 19-metre semi-trailers on Merlin Street in the northbound / eastbound direction
- Ben Boyd Road (south of Ernest Street) in the northbound direction, Ben Boyd Road (north of Belgrave Street) in the northbound direction and Sutherland Street in the westbound direction.

2. Assessment

The following local roads were assessed for their suitability as proposed heavy vehicle routes:

- Cammeray Avenue
- ANZAC Avenue
- Bells Avenue
- Warringa Road
- Amherst Street
- Cammeray Road (between Park Avenue and Amherst Street)
- Park Avenue
- Merlin Street
- Ben Boyd Road (south of Ernest Street)
- Ben Boyd Road (north of Belgrave Street)
- Sutherland Street.

Items that were considered in the assessment include:

- CoA E133: All requests to the Planning Secretary under Condition E132 must include the following:
 - CoA E133(a): include a swept path analysis

- CoA E133(b): demonstration that the use of local roads by heavy vehicles for the CSSI will not compromise the safety of pedestrians and cyclists or the safety of two-way traffic flow on two-way roadways
- CoA E133(c): provide details as to the date of completion of the road dilapidation surveys for the subject local roads
- CoA E133(d): measures that will be implemented to avoid where practicable the use of roads past schools, aged care facilities and child care facilities during their peak operation times.

Taking into account CoA E133(a), CoA E133(b), CoA E133(c) and CoA E133(d), it is considered that all local roads that were assessed are suitable as proposed heavy vehicle routes.

3. Formal statement

This assessment has been undertaken by Phillip Truong, who is an appropriately qualified professional from Turnbull Engineering.

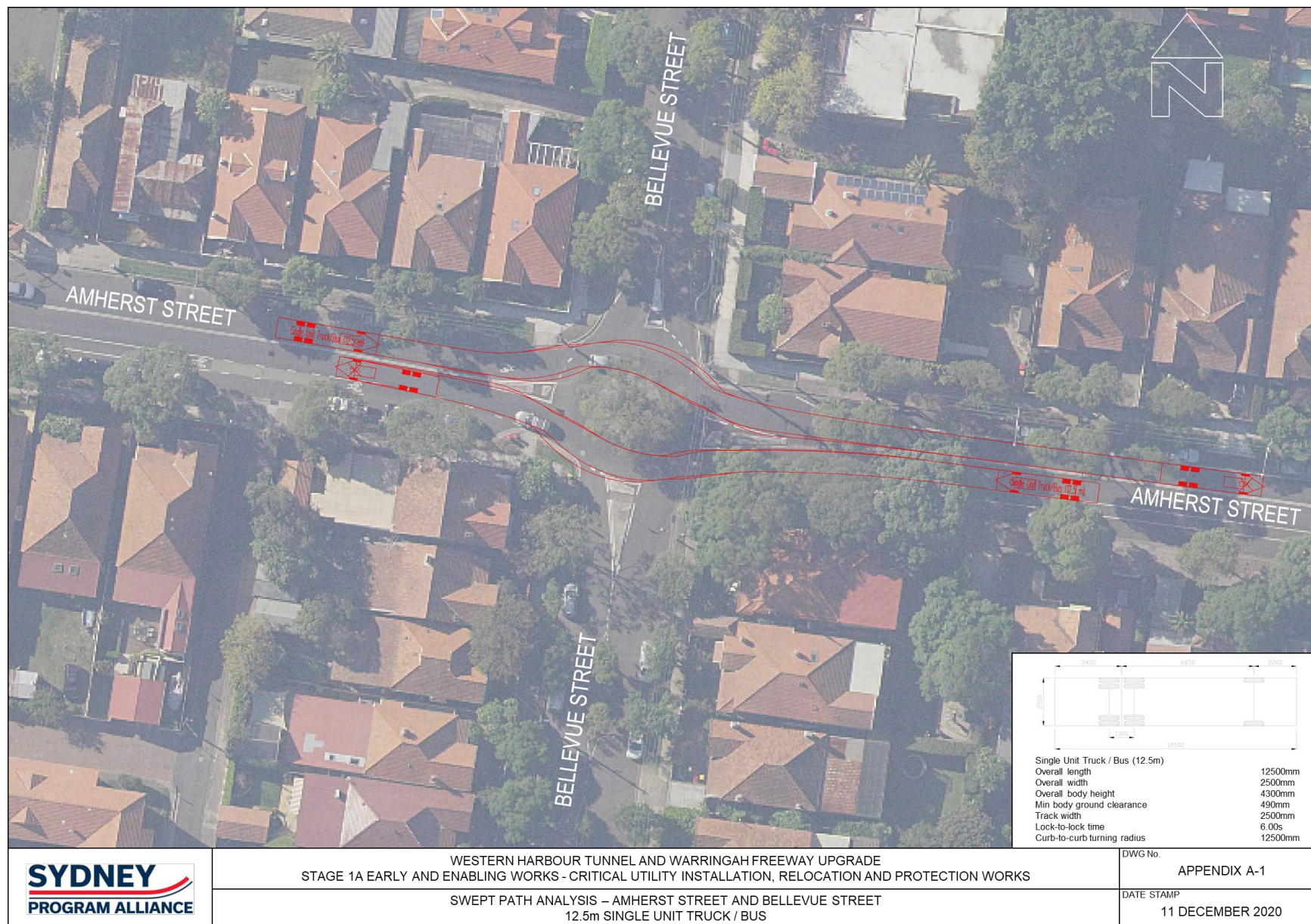
Phillip Truong is a project manager and traffic and transport engineer / planner with over 12 years of experience. He has a broad range of skills that enable him to analyse complex problems and develop innovative solutions. He has demonstrated these skills in major projects involving public transport planning, traffic engineering, traffic and transport management, traffic impact assessments, road user safety and road safety auditing. He has also undertaken environmental assessments as the traffic and transport technical lead for projects including Sydney Metro City & Southwest, Sydney Metro West, WestConnex Stage 1A, M1 Pacific Motorway Extension to Raymond Terrace and Sydney International Speedway.

This assessment has been undertaken for the sole purpose of providing advice on the suitability of proposed heavy vehicle routes for the Stage 1A Early and Enabling Works – Critical utility installation, relocation and protection in accordance with the NSW Minister for Planning and Public Space's Conditions of Approval (CoA) E133(e). The findings are the opinion and judgement of Phillip Truong:



Phillip Truong
Senior Transport Engineer
30.09.2021

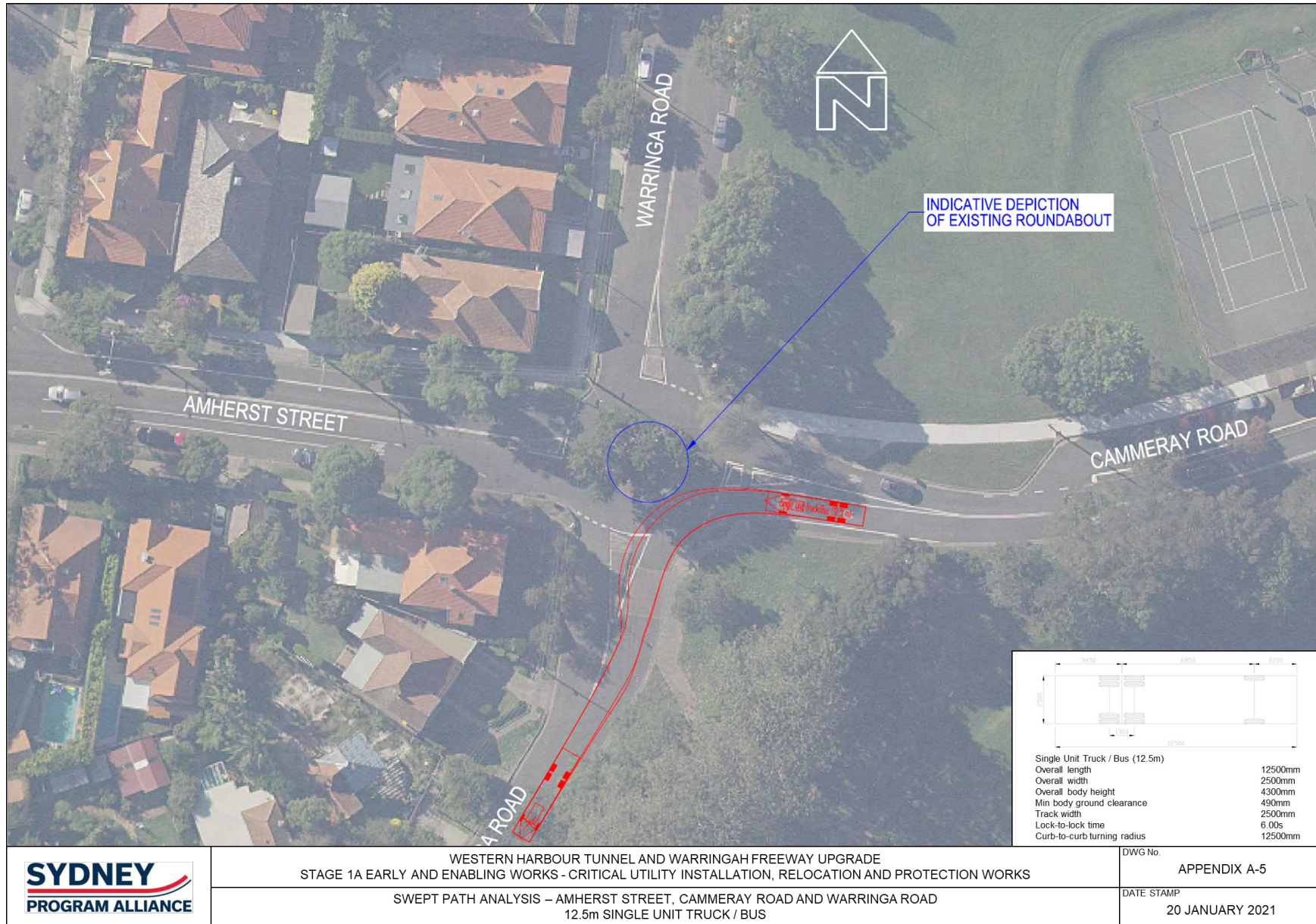
Appendix A2 Swept path diagrams

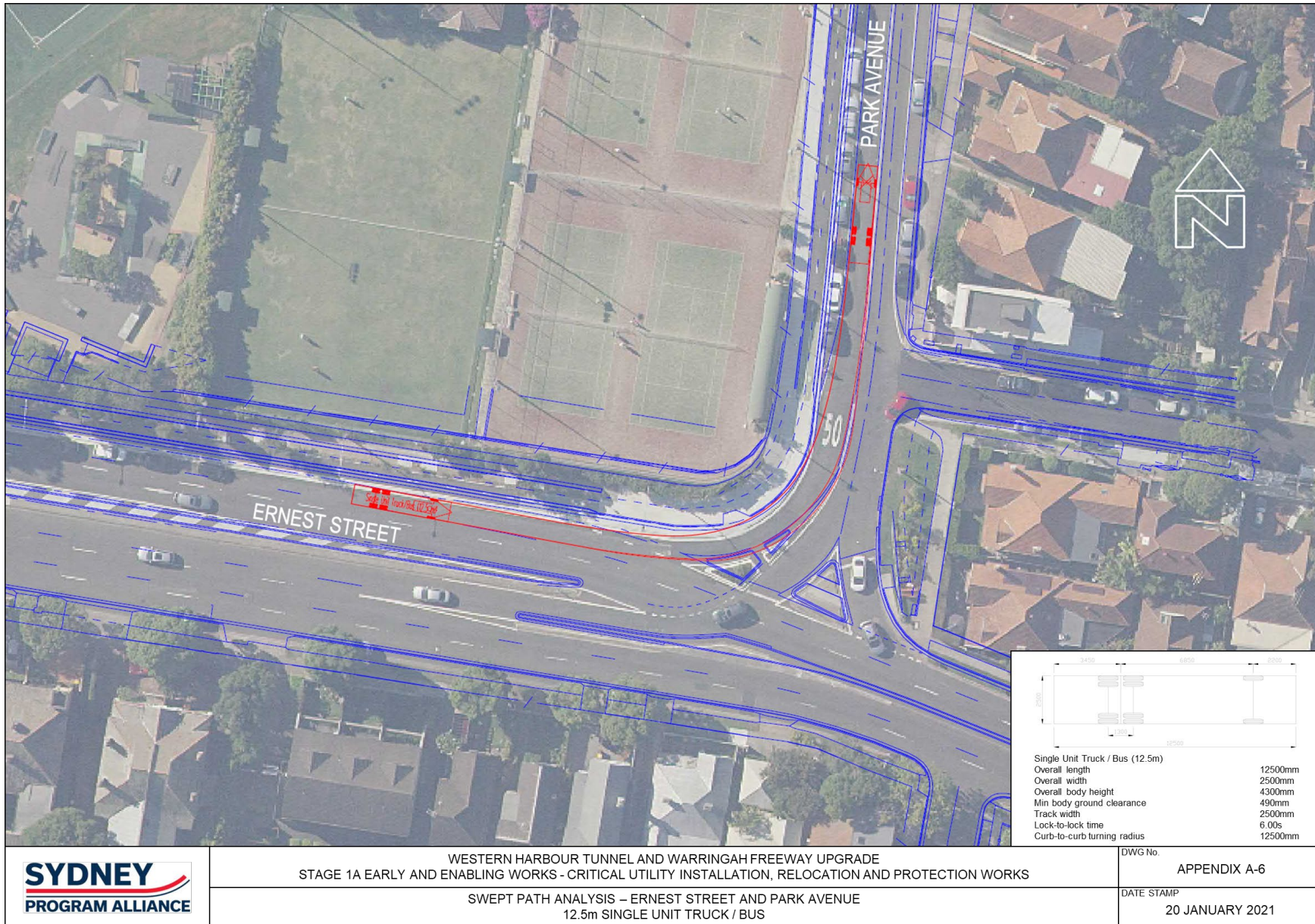


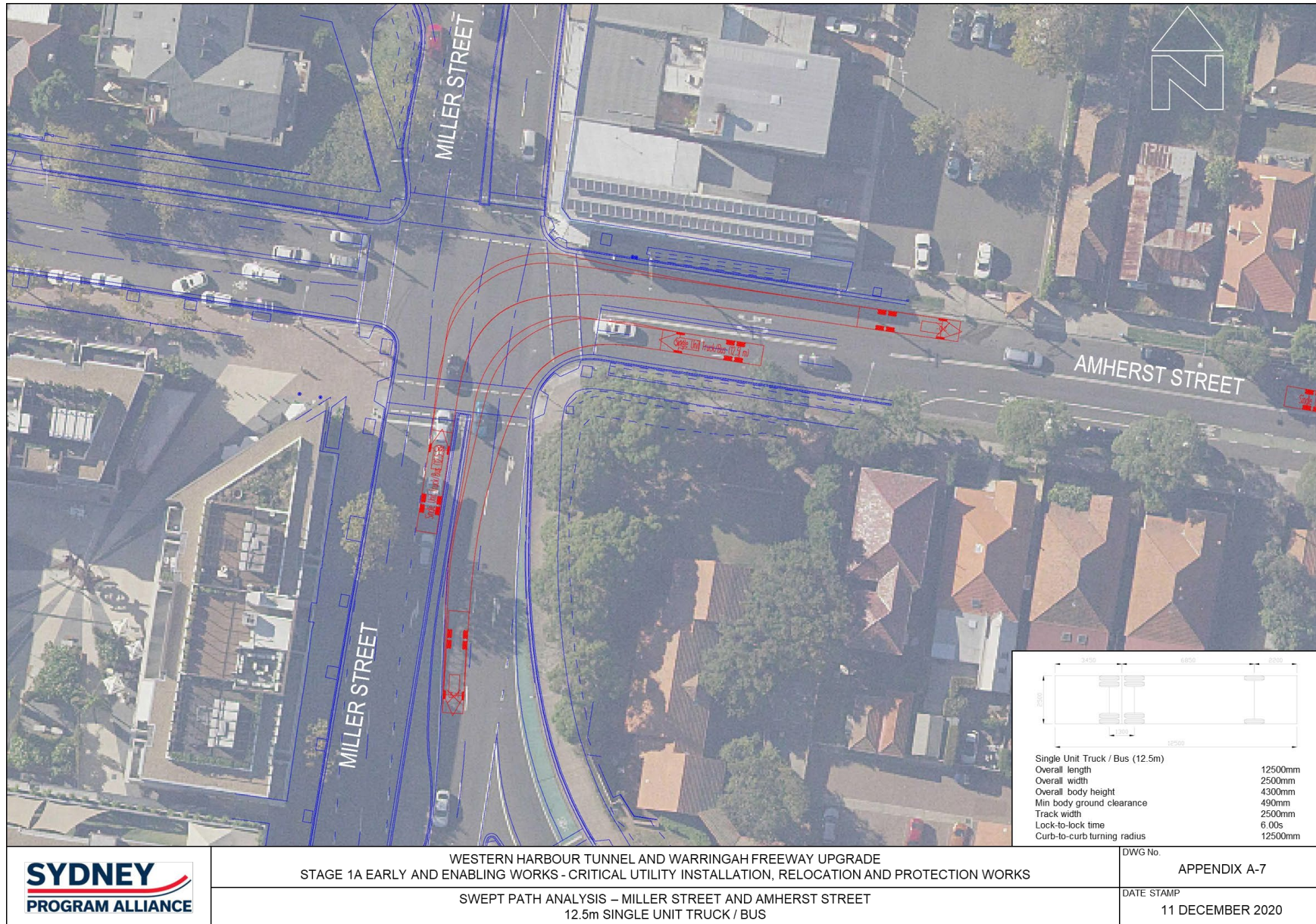


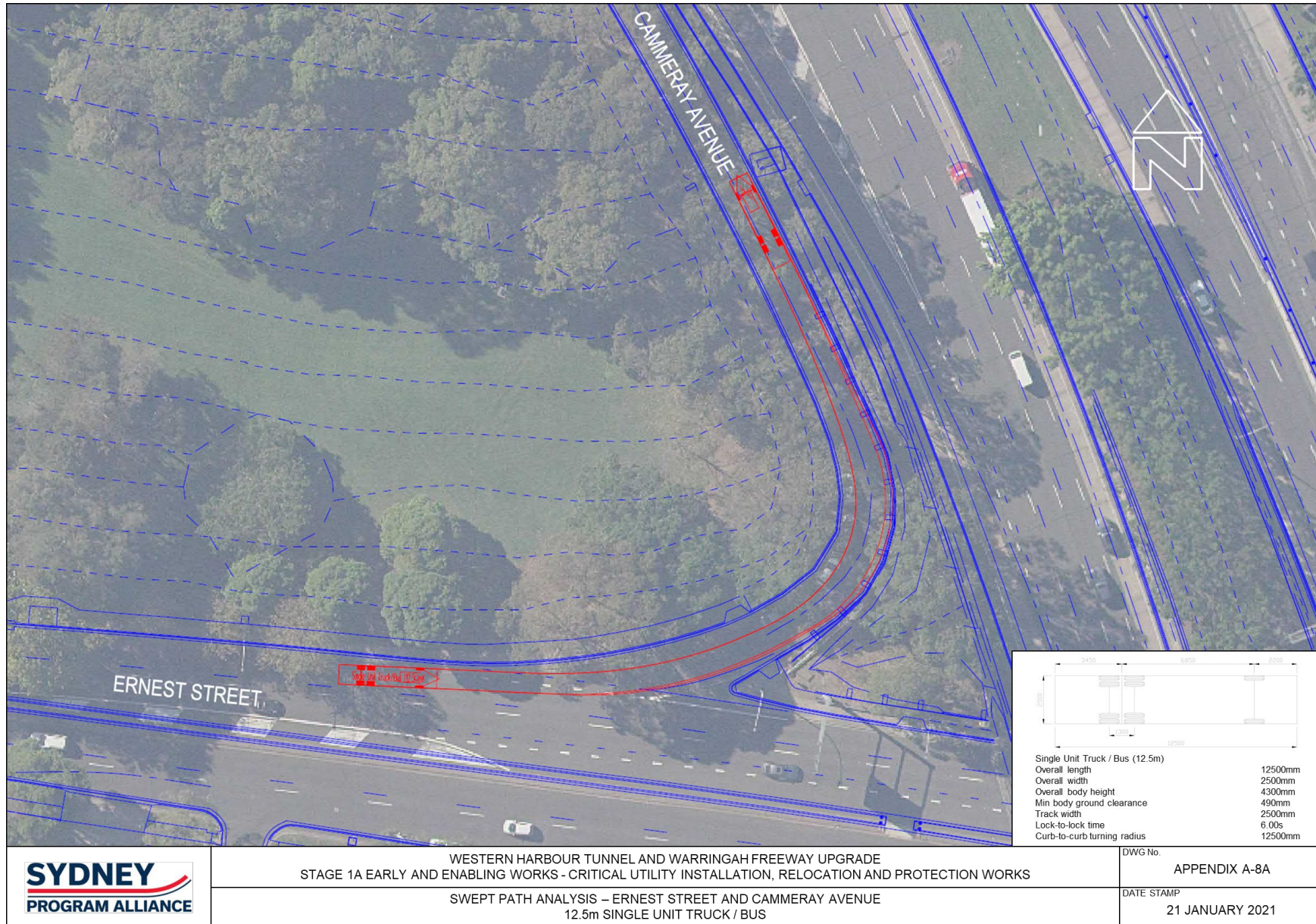


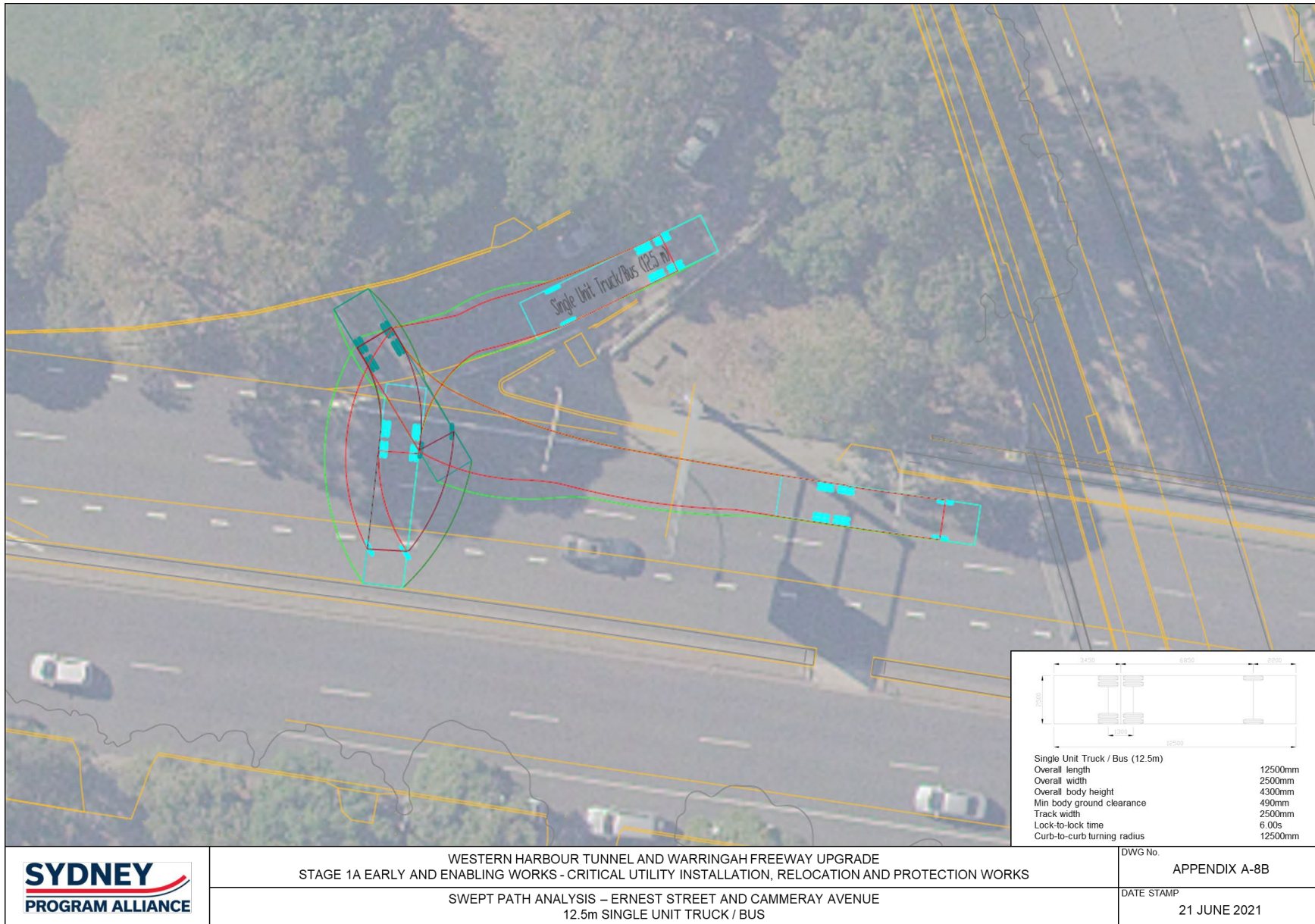


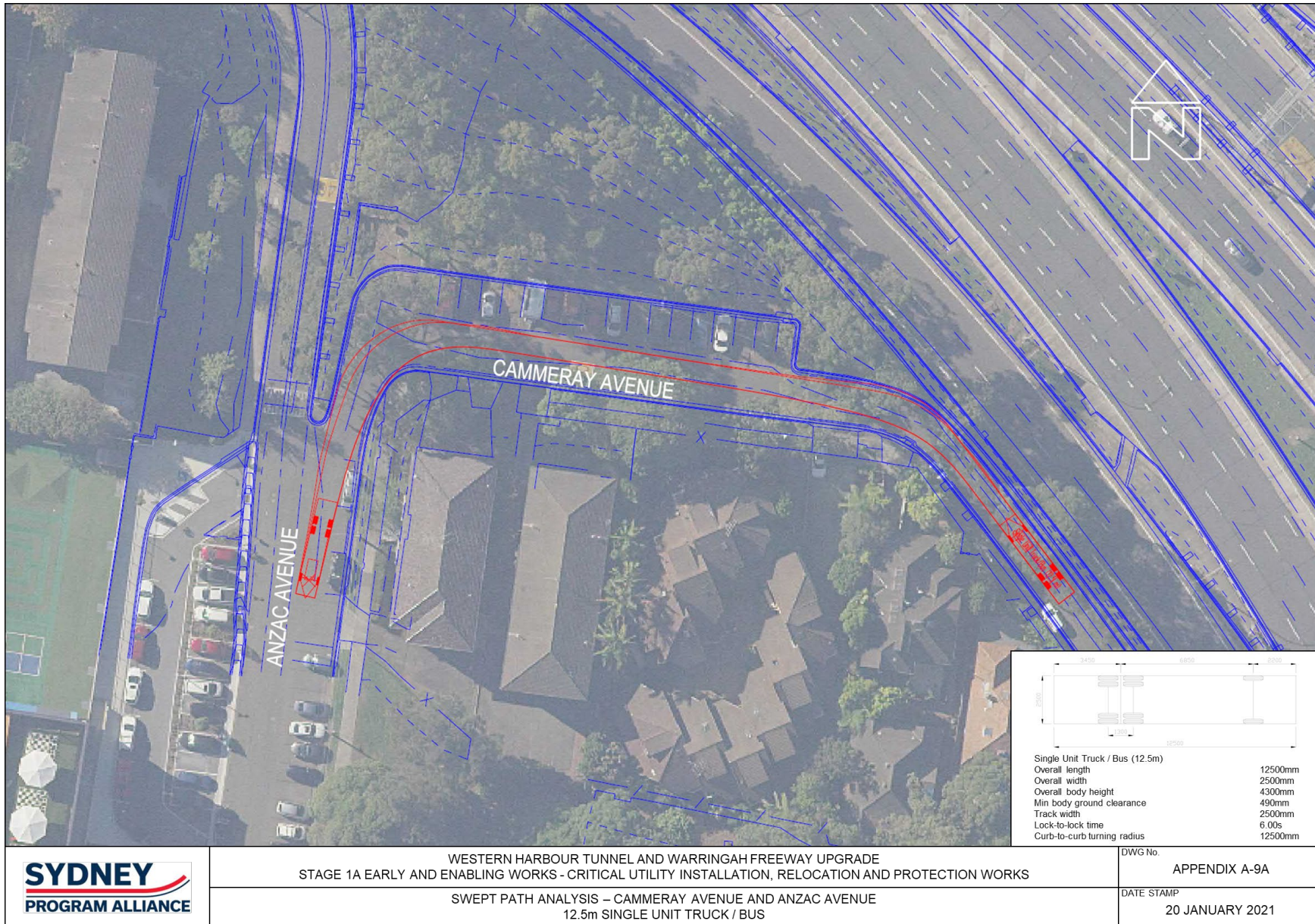




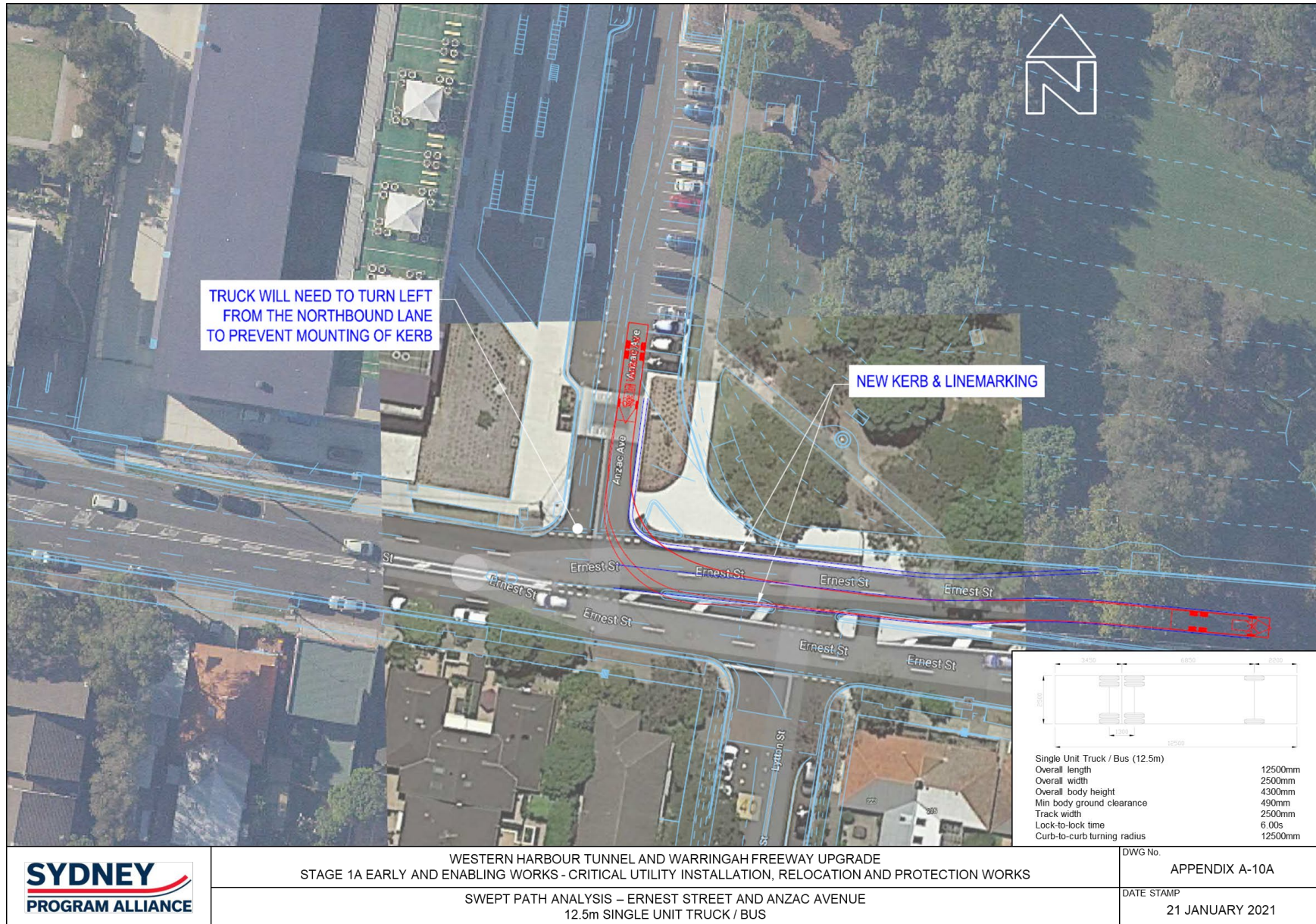


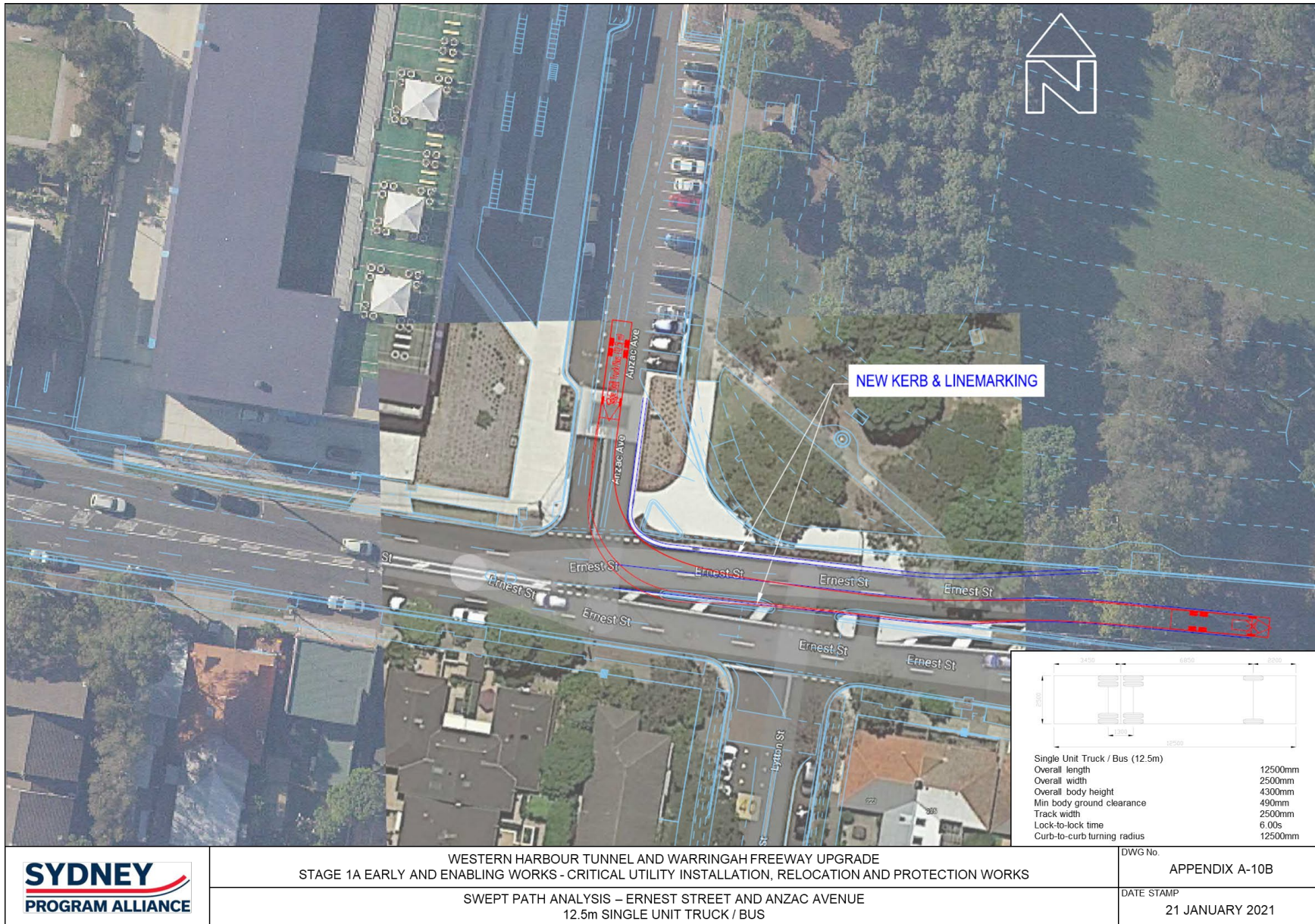


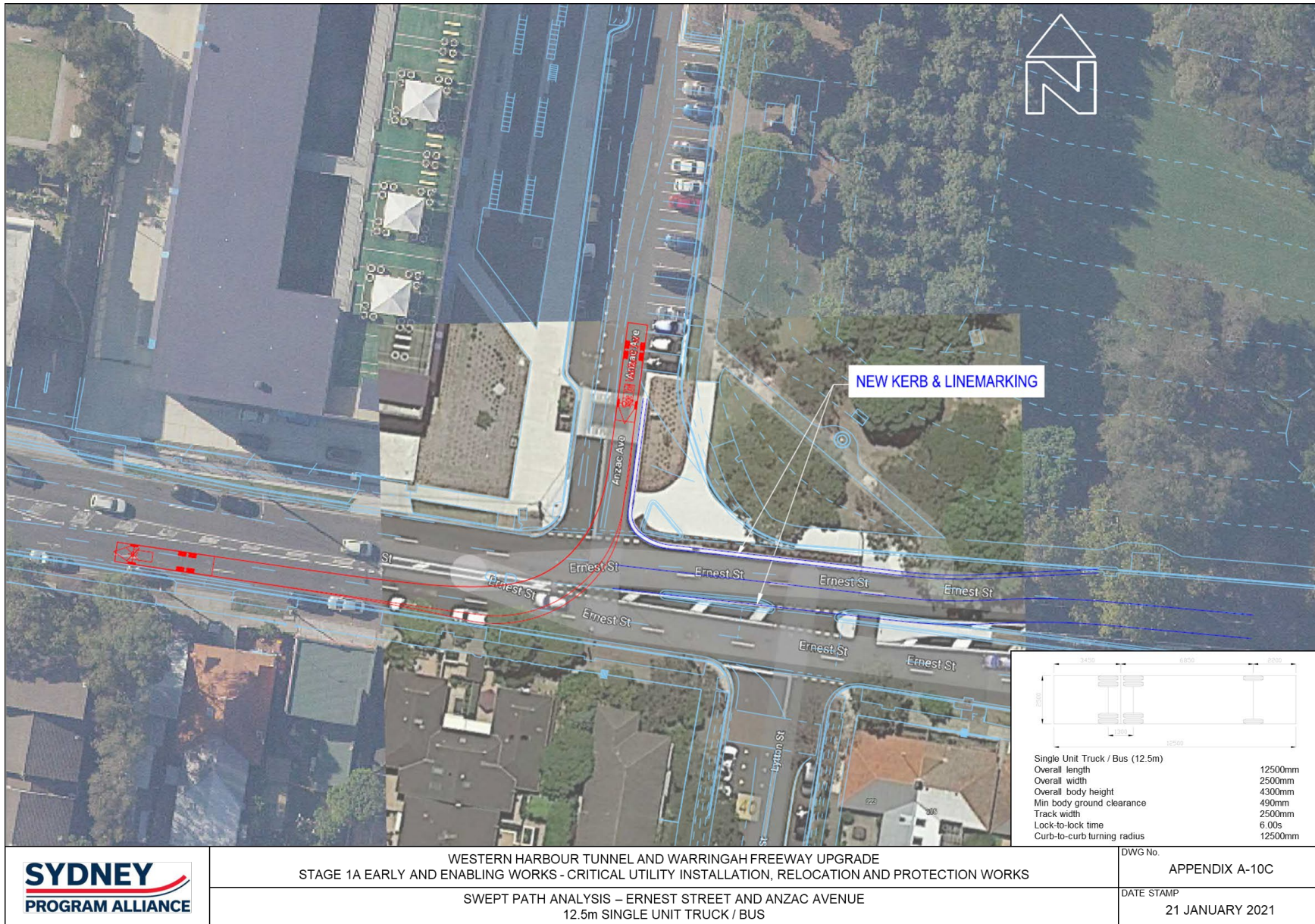


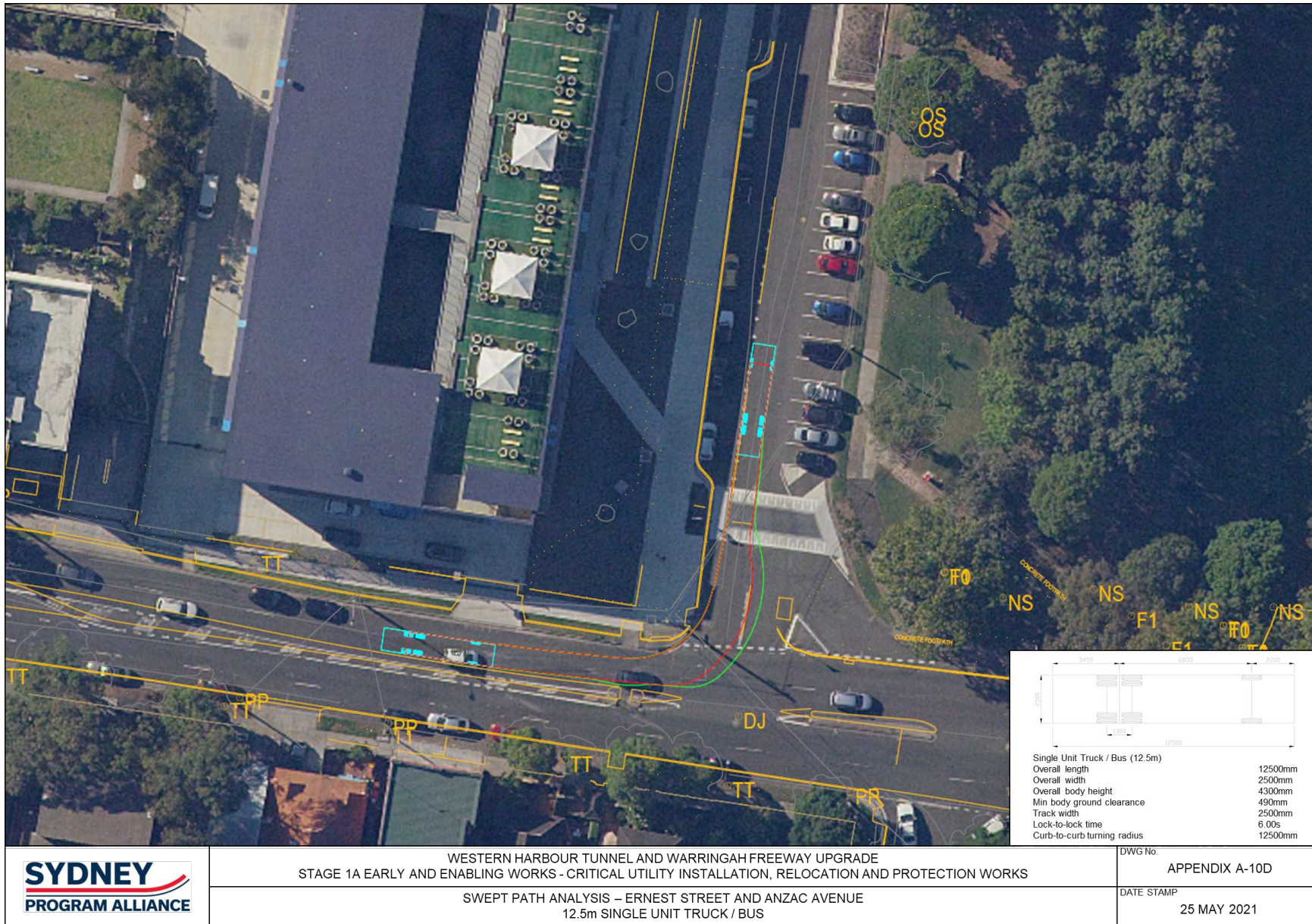












WESTERN HARBOUR TUNNEL AND WARRINGAH FREEWAY UPGRADE
STAGE 1A EARLY AND ENABLING WORKS - CRITICAL UTILITY INSTALLATION, RELOCATION AND PROTECTION WORKS

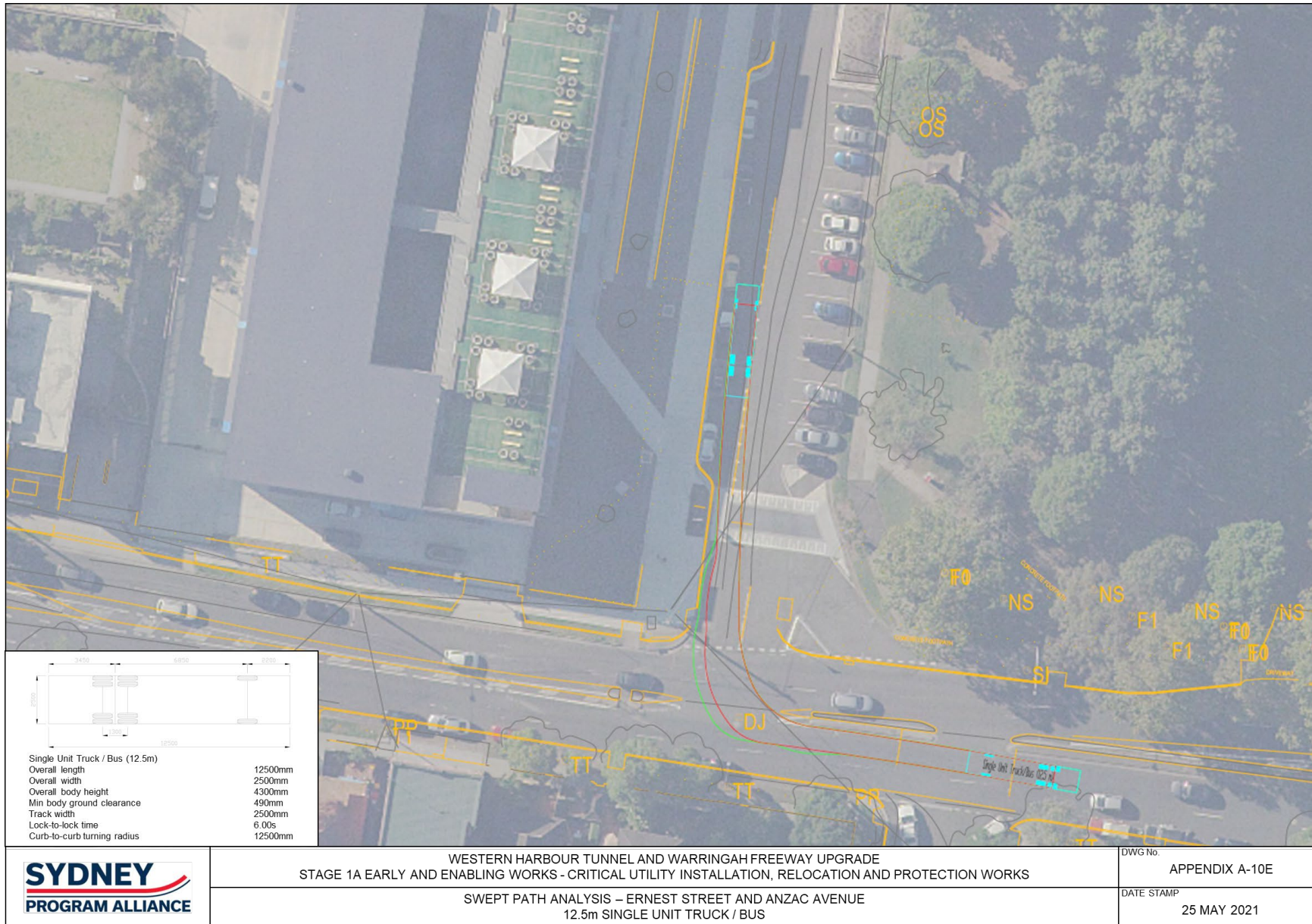
SWEPT PATH ANALYSIS - ERNEST STREET AND ANZAC AVENUE
12.5m SINGLE UNIT TRUCK / BUS


DWG No.

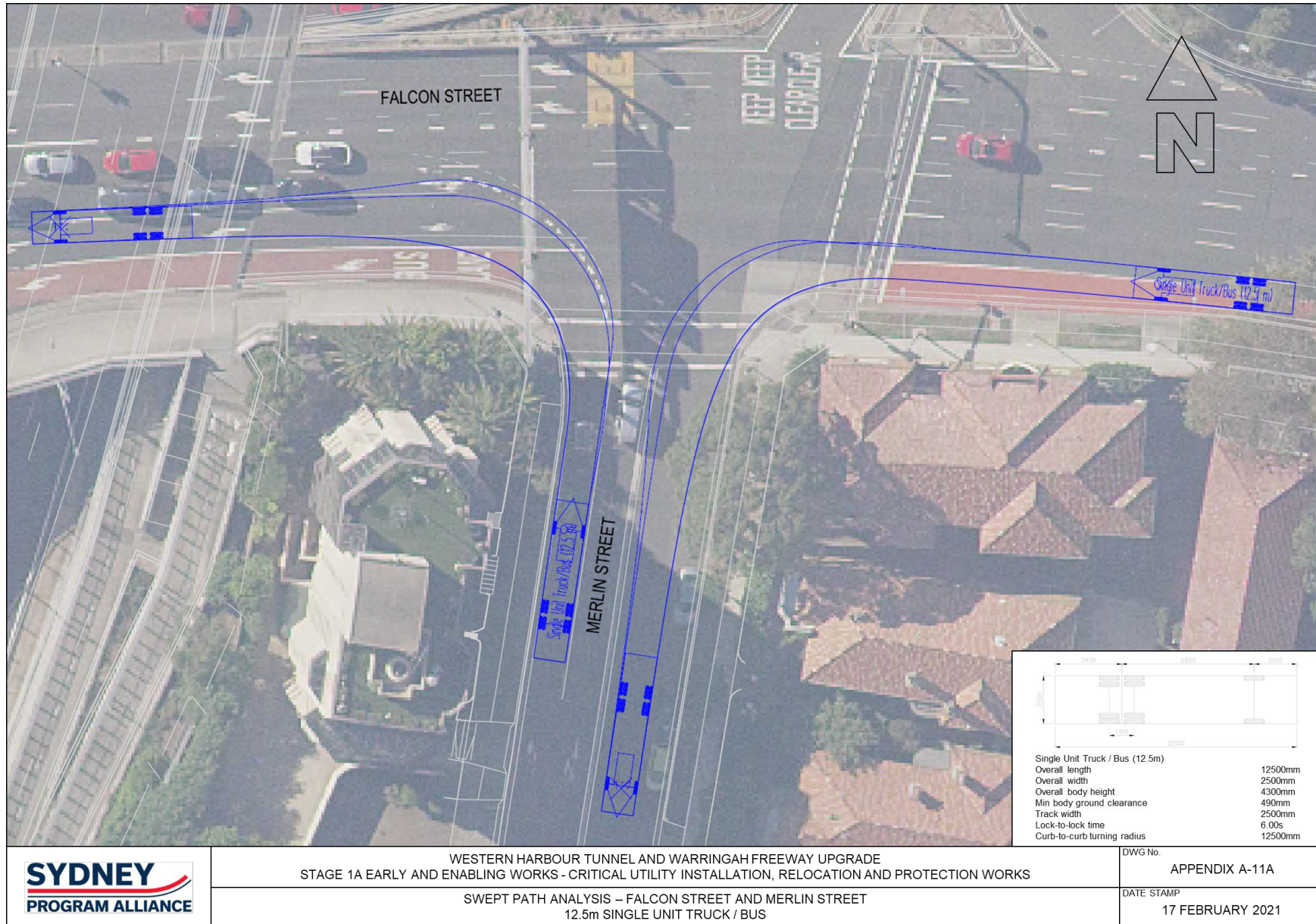
APPENDIX A-10D

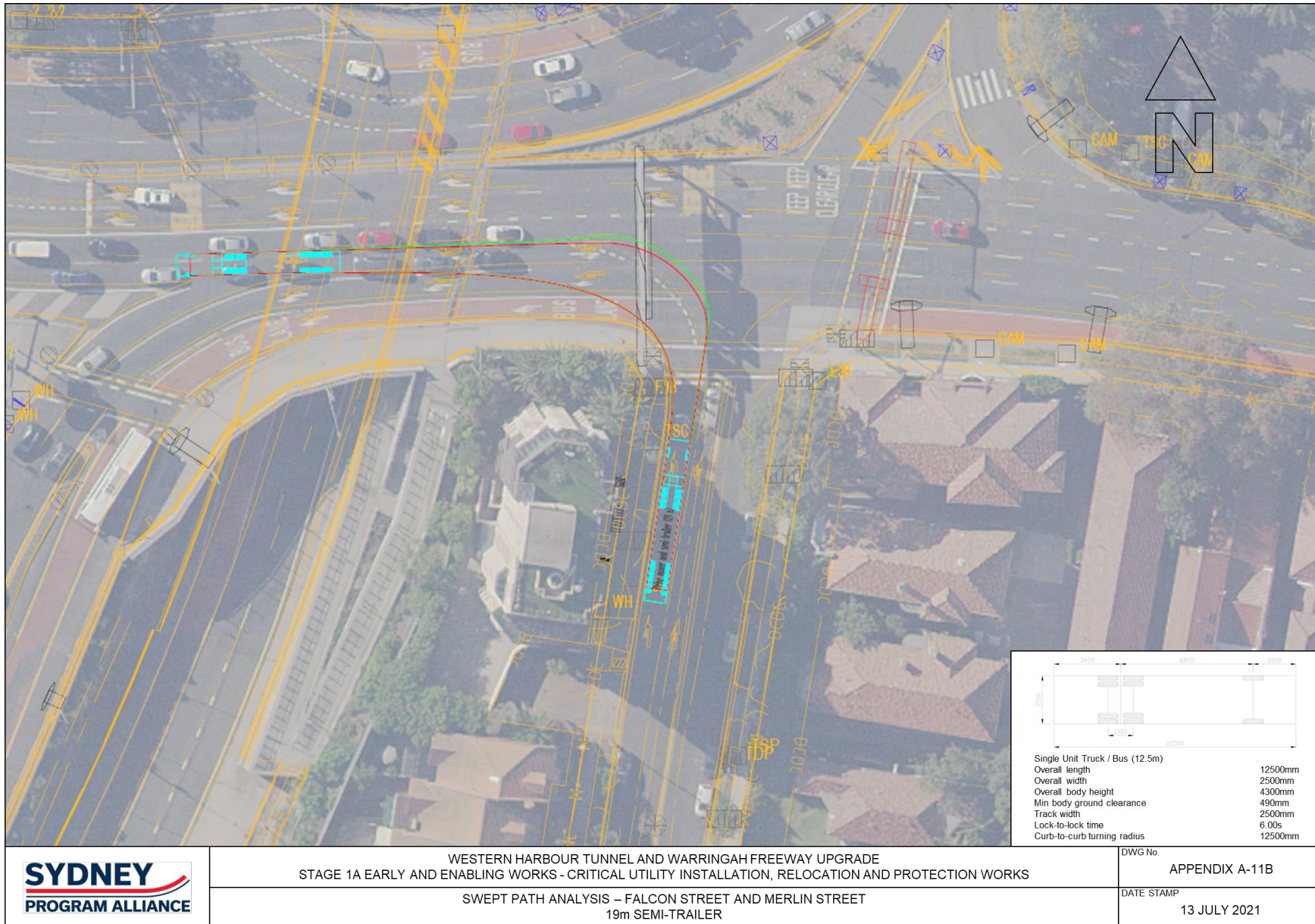
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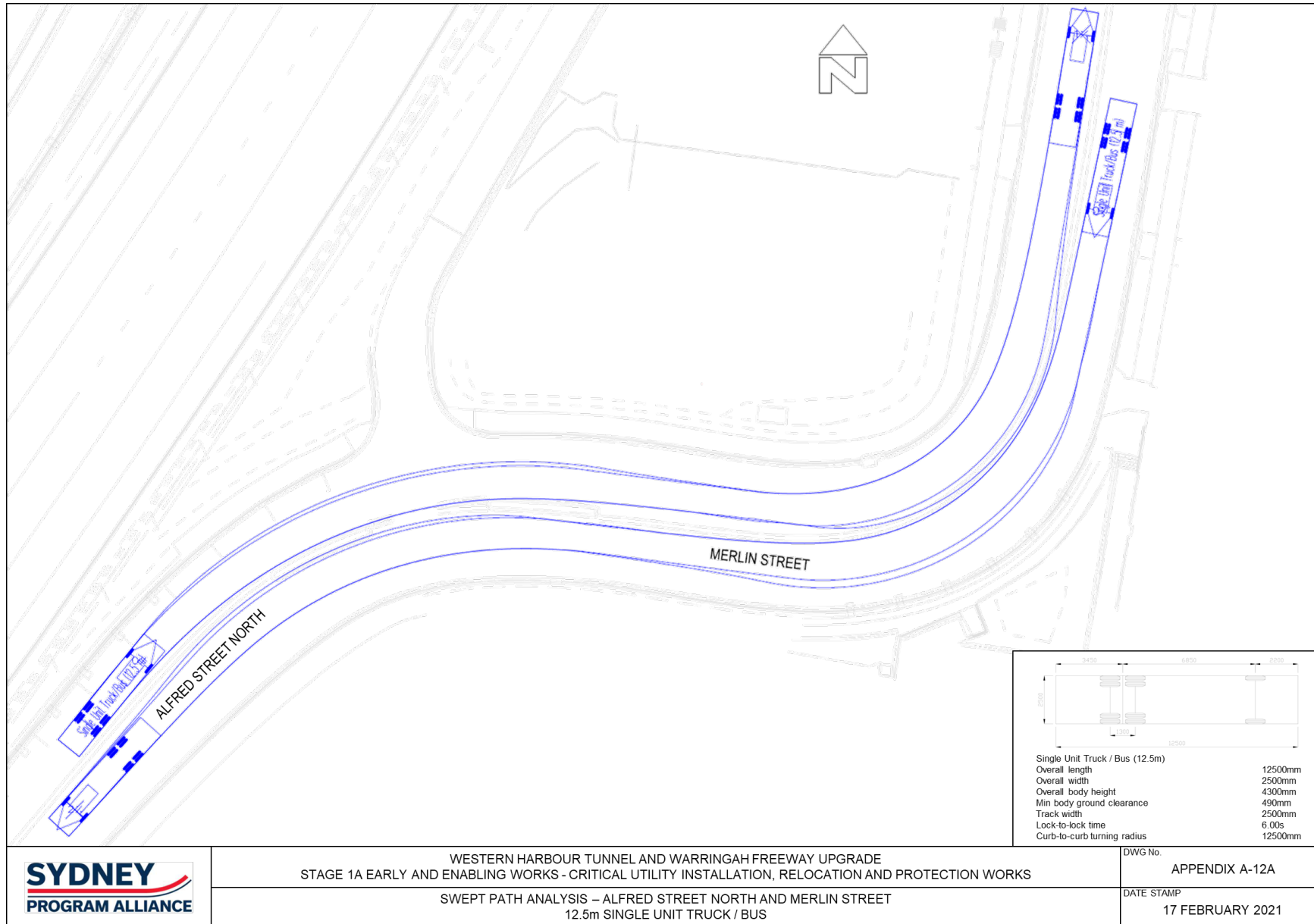
25 MAY 2021

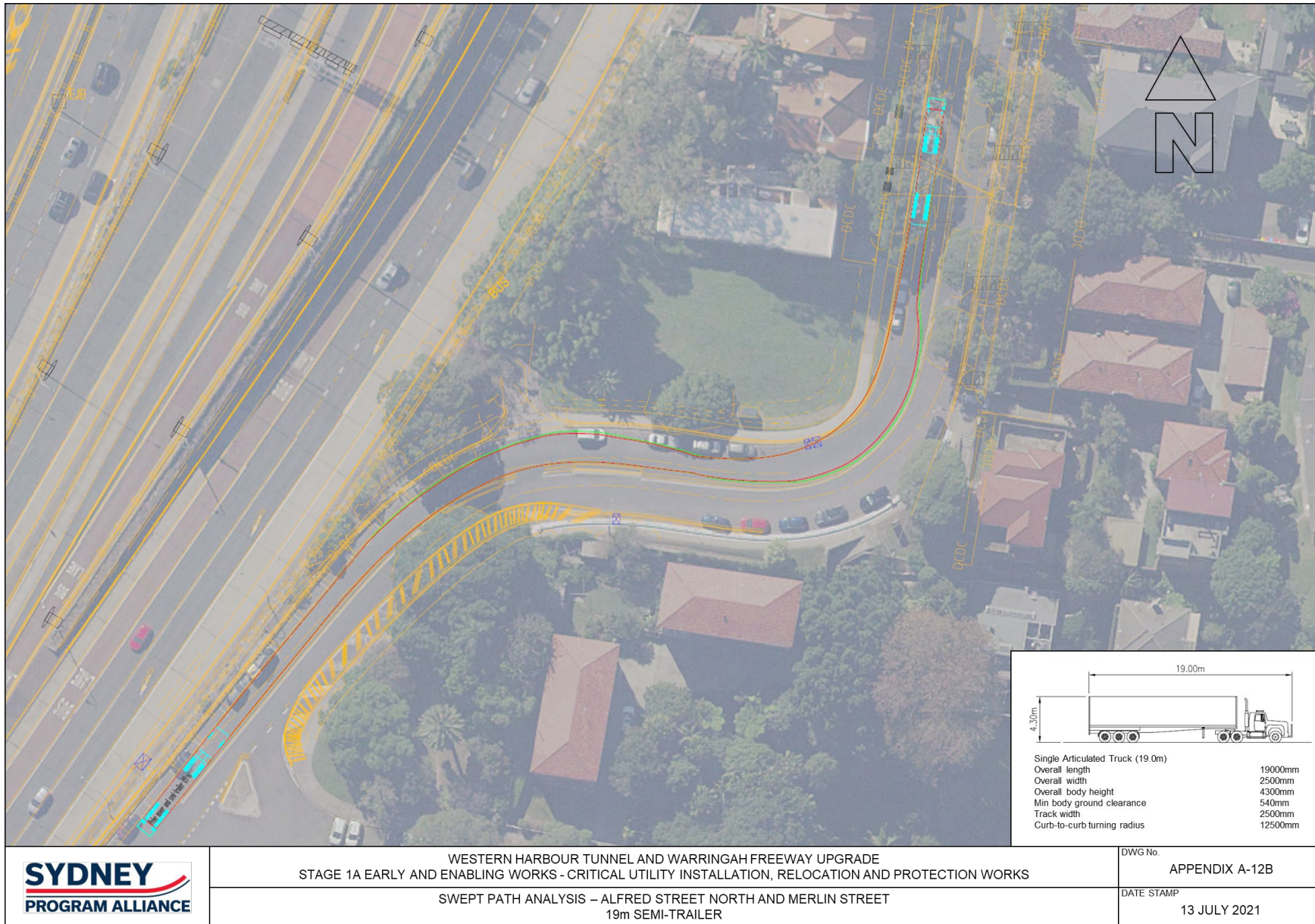


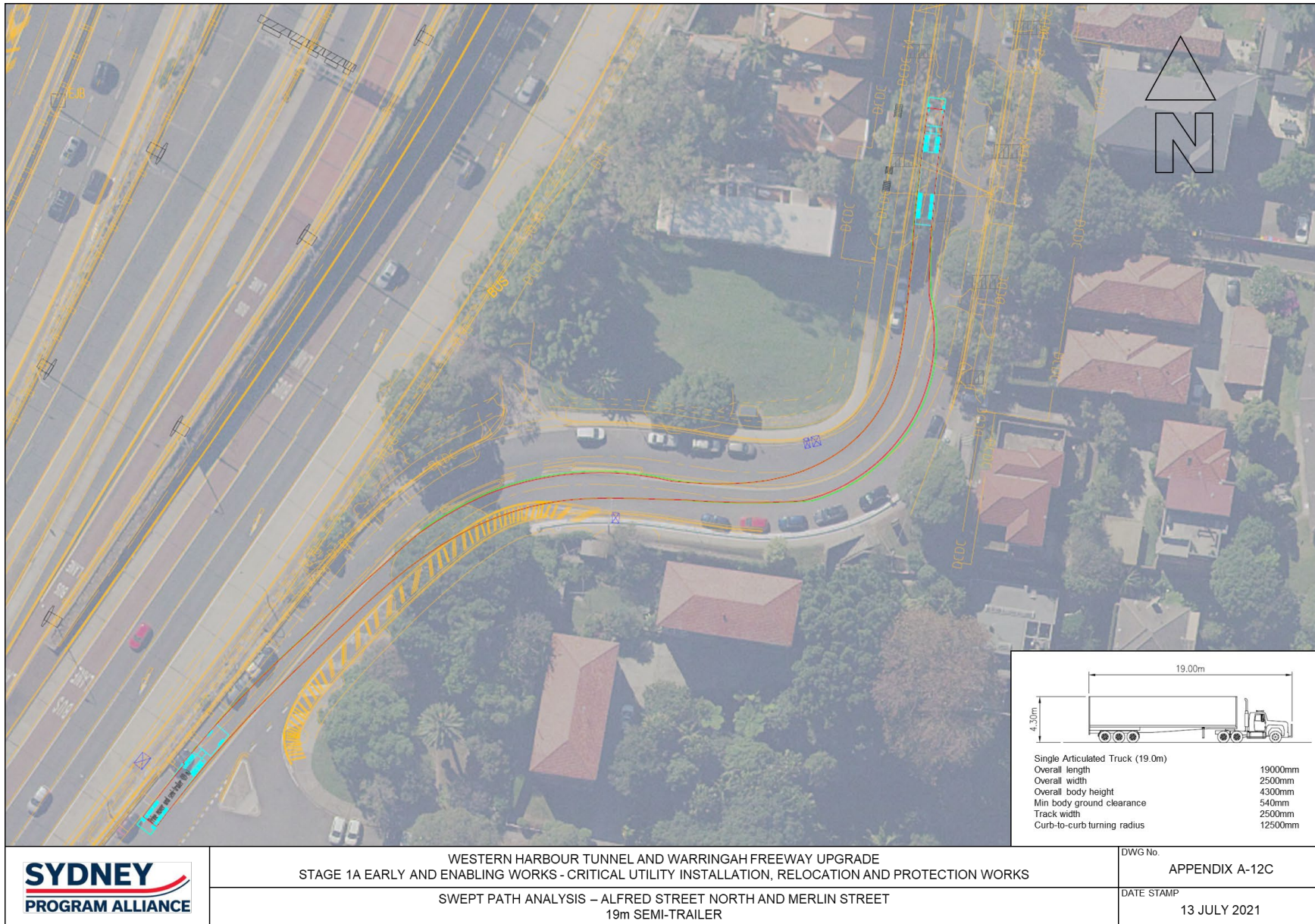
	WESTERN HARBOUR TUNNEL AND WARRINGAH FREEWAY UPGRADE STAGE 1A EARLY AND ENABLING WORKS - CRITICAL UTILITY INSTALLATION, RELOCATION AND PROTECTION WORKS	DWG No.	APPENDIX A-10E
	SWEEP PATH ANALYSIS – ERNEST STREET AND ANZAC AVENUE 12.5m SINGLE UNIT TRUCK / BUS	DATE STAMP	25 MAY 2021

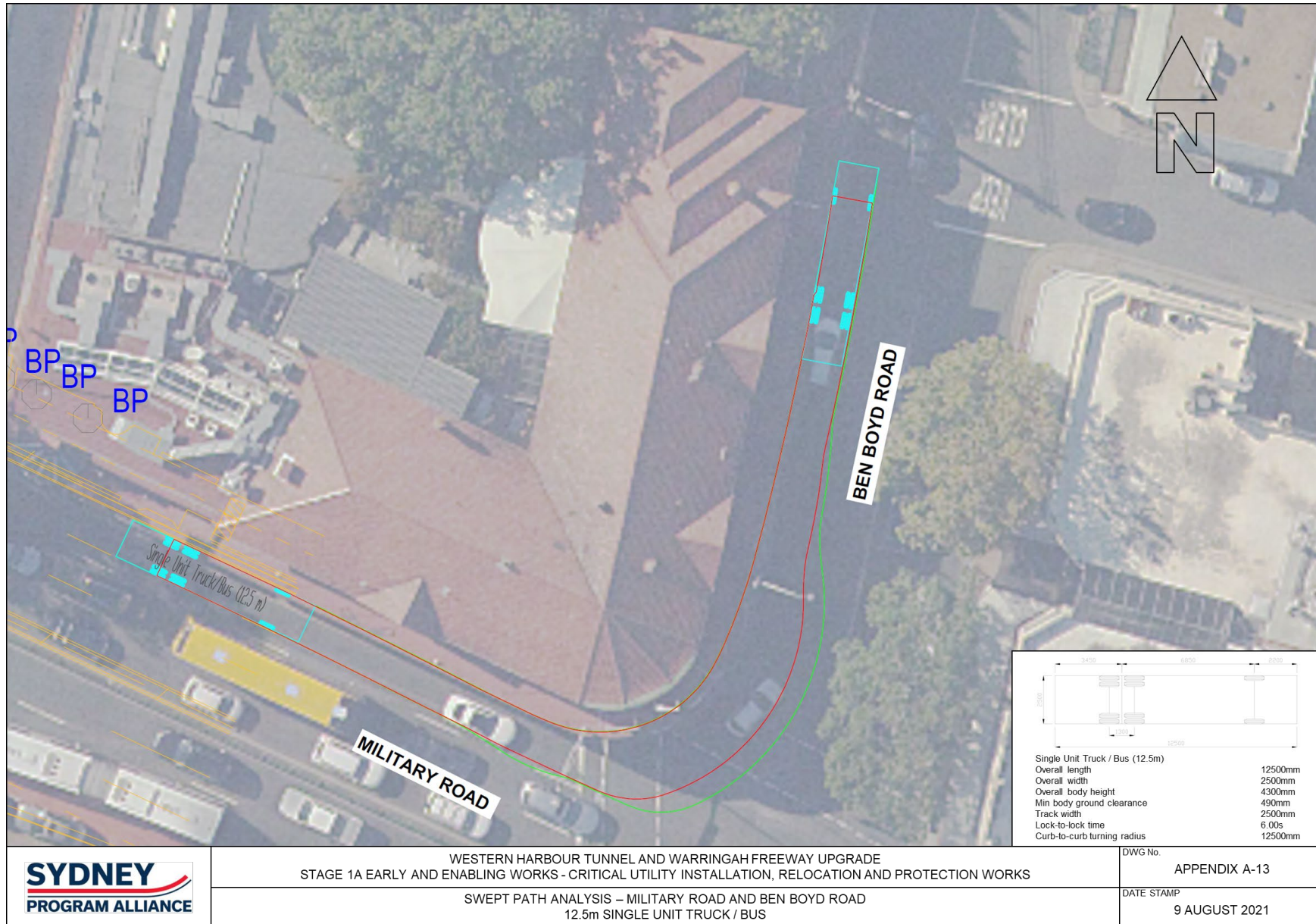


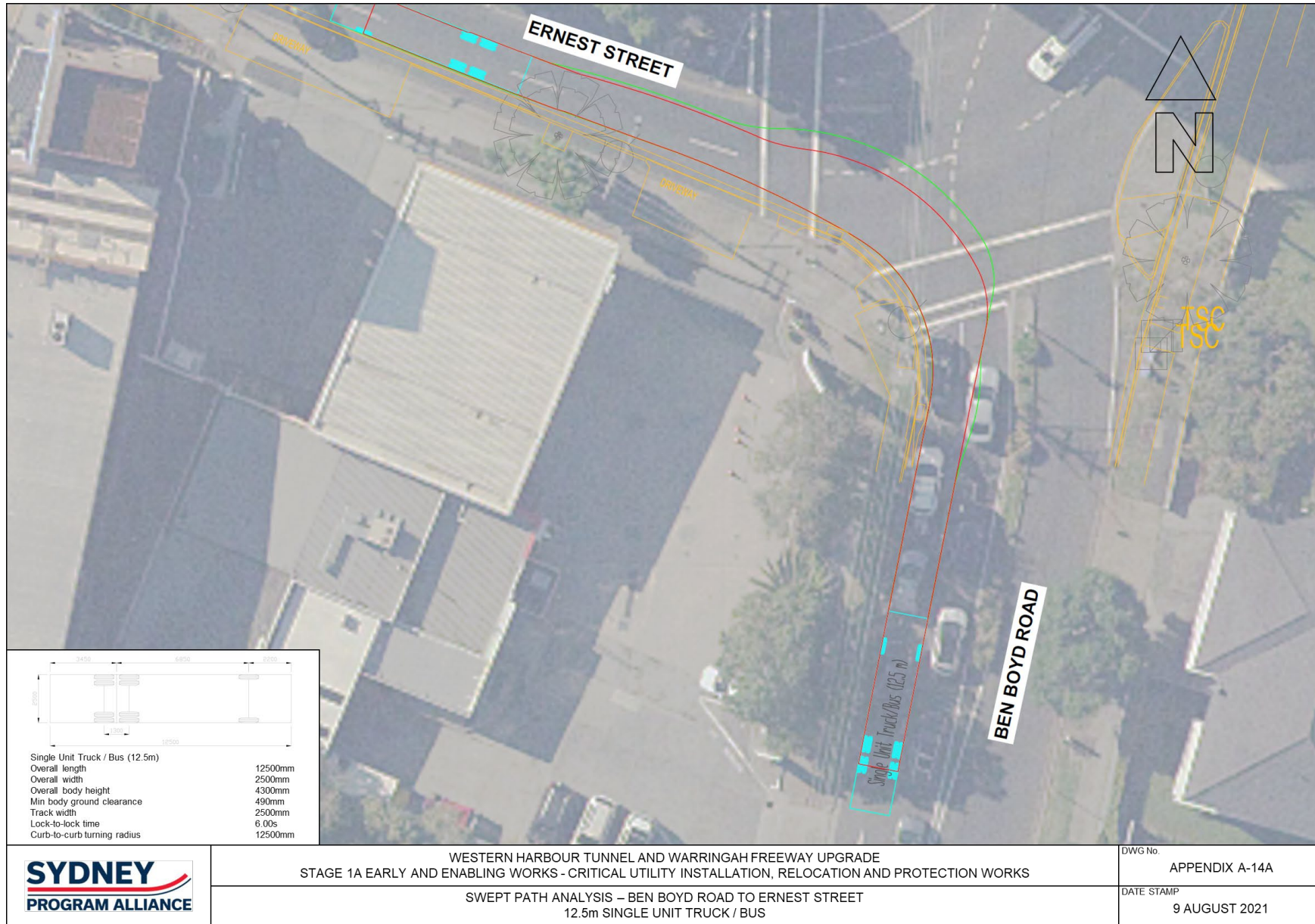


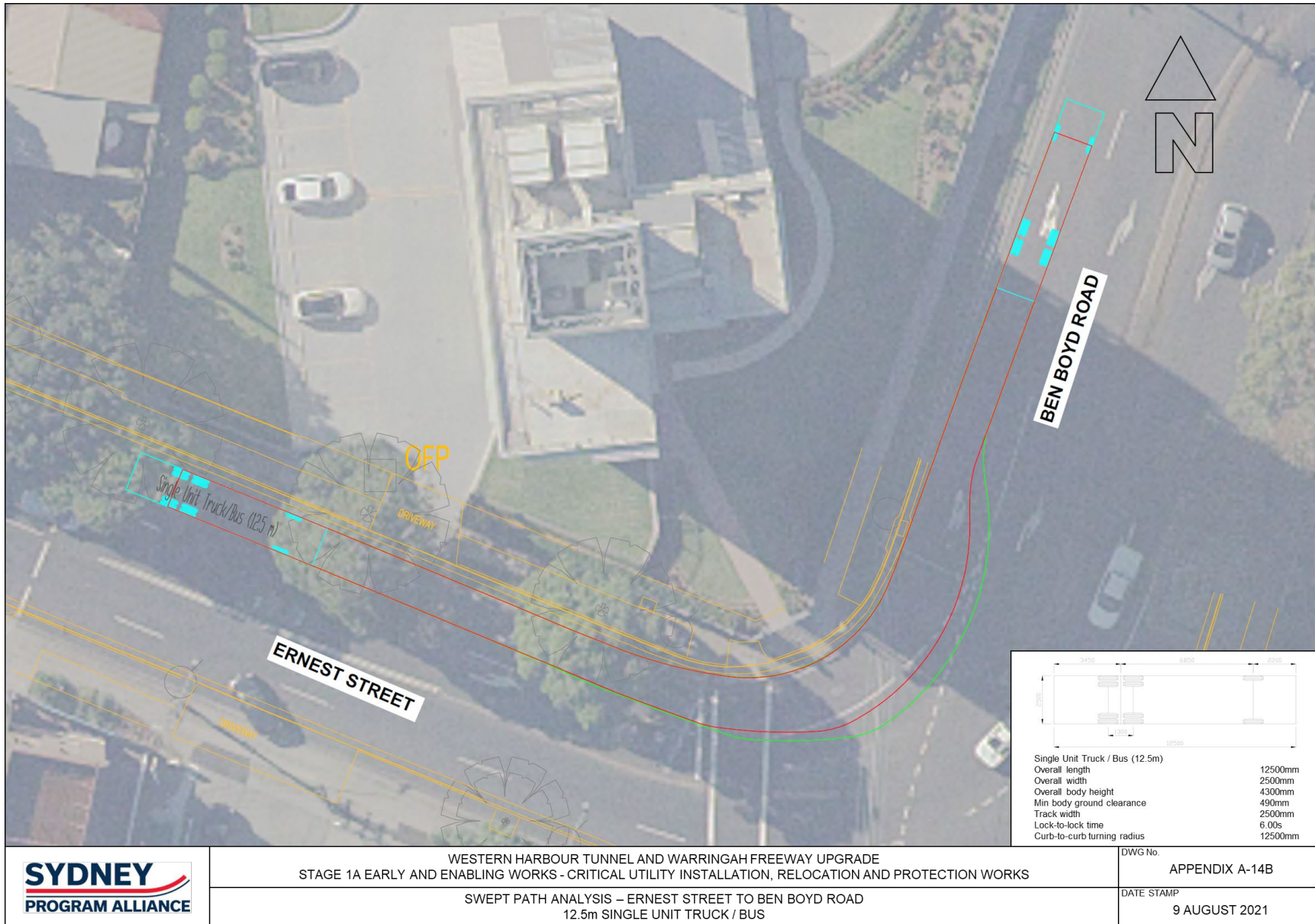




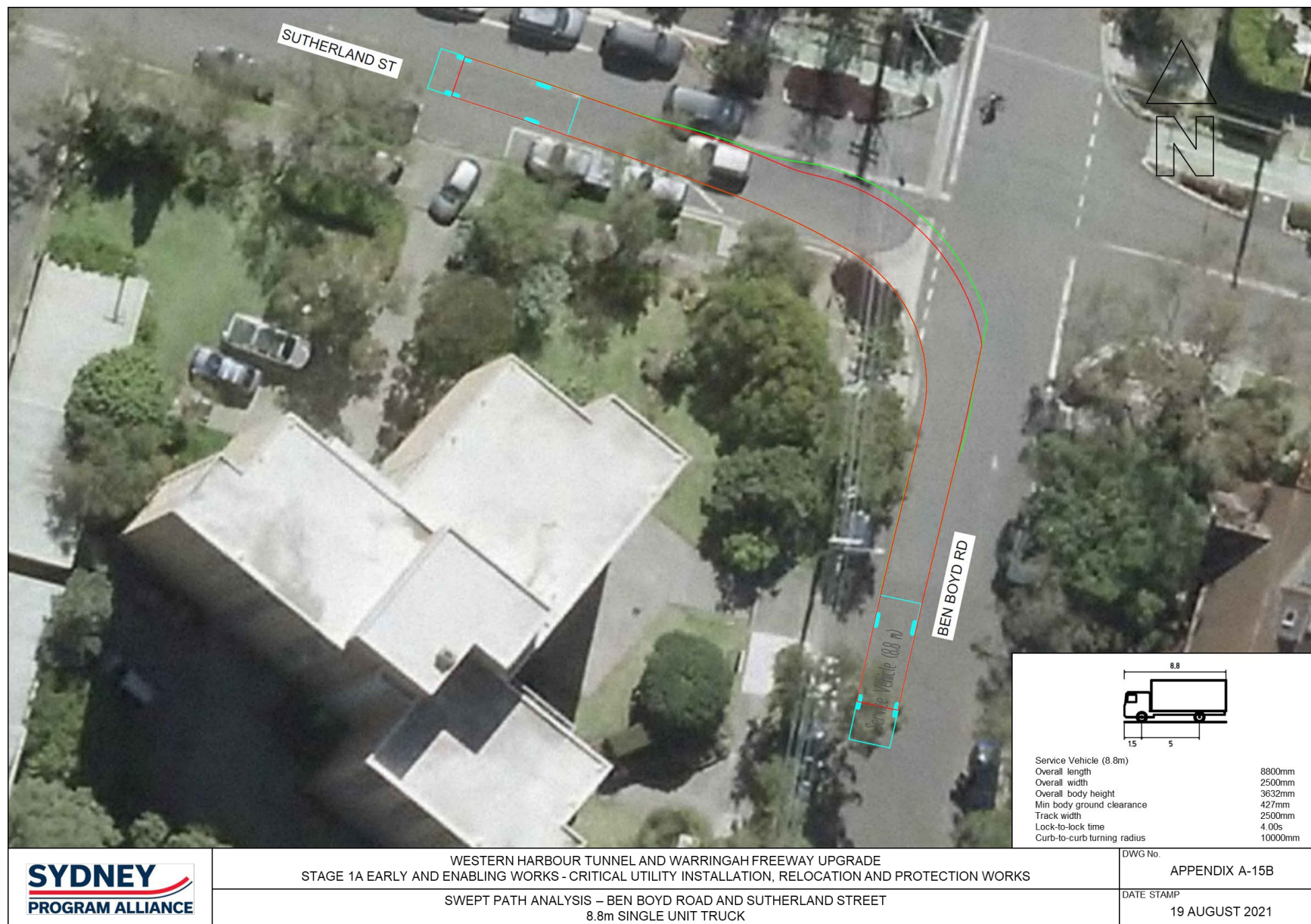


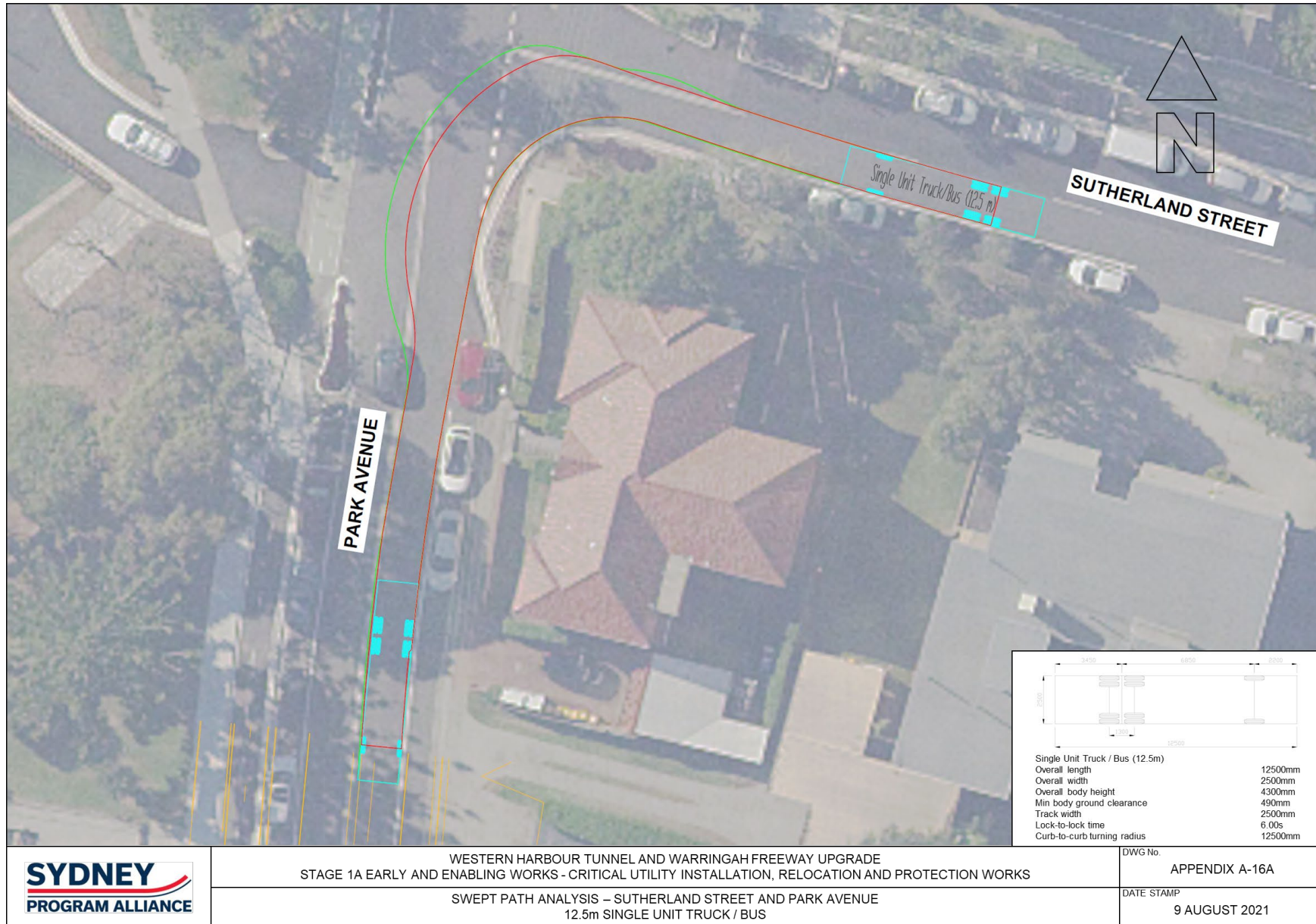


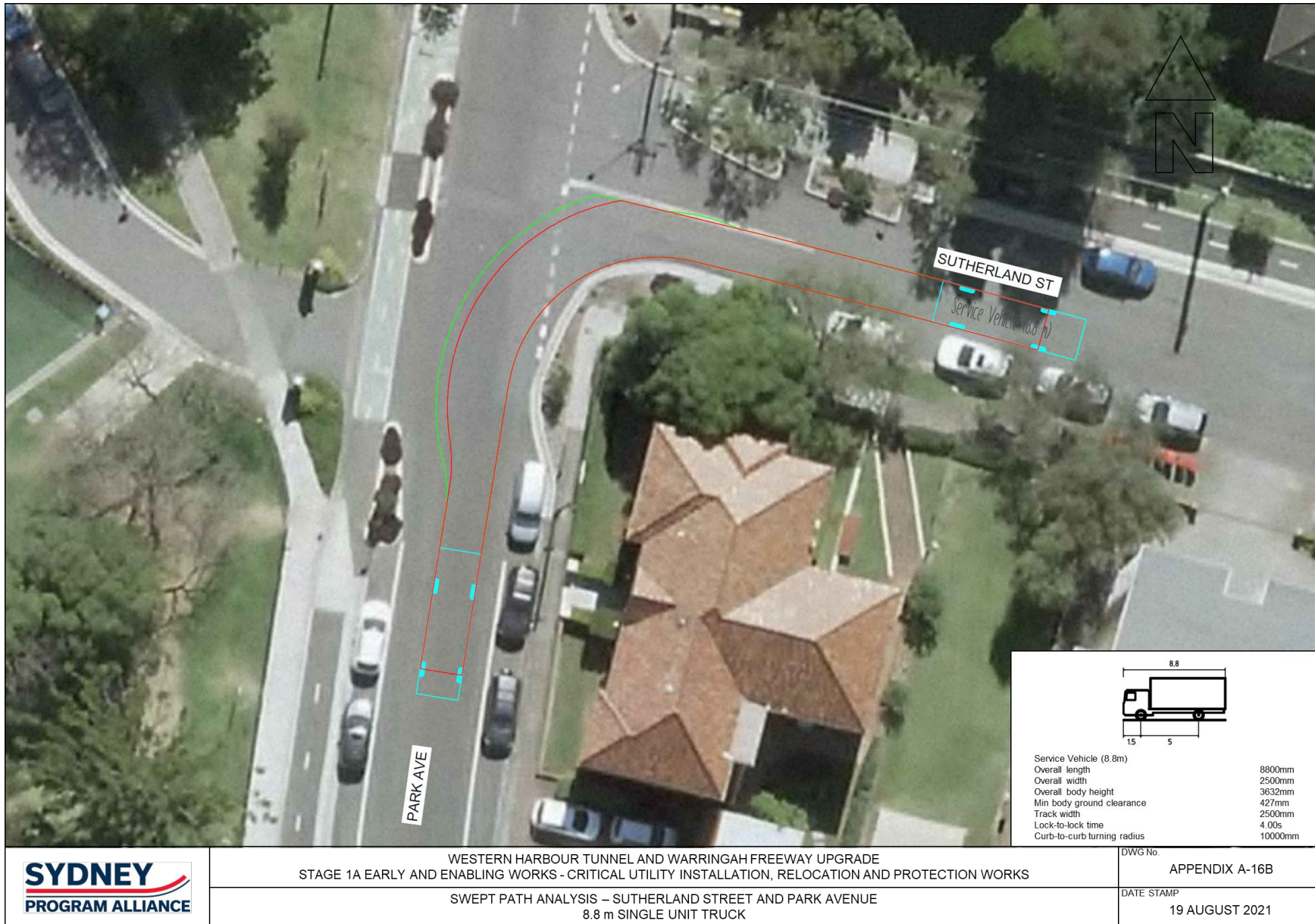














Appendix A3 The risk assessment system

Each identified hazard has been recorded and assessed in accordance with the Austroads *Guide to Road Safety Part 6: Managing Road Safety Audits* (Edition 1.0), 2019. The guide recommends a risk matrix be used to determine the level of risk associated with each hazard. This risk matrix is described below.

Estimated crash frequency: the probable frequency of an incident occurring as a direct result of the hazard was determined using the scale displayed in Table A2-4-1.

Table A2-4-1 Estimated crash frequency

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Estimated crash severity: the likely severity of the incident which occurred as a direct result of the hazard was determined using the scale displayed in Table A2-4-2.

Table A2-4-2 Estimated crash severity

Severity	Description	Examples
Catastrophic	Likely multiple deaths	<ul style="list-style-type: none">• High-speed, multi-vehicle crash on freeway• Car runs into crowded bus stop• Bus and petrol tanker collide• Collapse of a bridge or tunnel
Serious	Likely death or serious injury	<ul style="list-style-type: none">• High or medium-speed vehicle/vehicle collision• High or medium-speed collision with a fixed roadside object• Pedestrian or cyclist struck by a car
Minor	Likely minor injury	<ul style="list-style-type: none">• Some low-speed vehicle collisions• Cyclists falls from bicycle at low speed• Left-turn rear-end crash in a slip lane
Limited	Likely trivial injury or property damage only	<ul style="list-style-type: none">• Some low speed vehicle collisions• Pedestrian walks into object (no head injury)• Car reverses into post

Deemed level of risk: the risk matrix displayed in Table A2-4-3 was used to assess the level of risk for each hazard. The risk matrix uses the frequency / severity determined above to determine the likely level of risk for each hazard.

Table A2-4-3 Deemed level of risk

		Frequency			
		Frequent	Probable	Occasional	Improbable
Severity	Catastrophic	Intolerable	Intolerable	Intolerable	High
	Serious	Intolerable	Intolerable	High	Medium
	Minor	Intolerable	High	Medium	Low
	Limited	High	Medium	Low	Low

Appendix A4 Driver’s Code of Conduct

Driver Code of Conduct

This Driver Code of Conduct applies to all Sydney Program Alliance personnel and any other person undertaking work for the Sydney Program Alliance, whether they are a direct employee of Sydney Program Alliance or employed by another organisation providing a service or product to Sydney Program Alliance.

All drivers must:

- Drive courteously.
- Obey all road rules, including posted speed limits and other traffic signage within work sites and site compounds.
- Take extreme care when driving past other vehicles travelling in the opposite direction on local roads including ANZAC Avenue, Bells Avenue, Warringa Road, Amherst Street, Cammeray Road, Park Avenue and Merlin Street.
- Report any incidents or near misses to your supervisor immediately.
- Hold a current and valid driving licence for the class of vehicle that you operate. Additionally, you must always carry your current driver licence with you while you are on duty. If your licence is cancelled or suspended, you must let your supervisor know immediately.
- Maintain and operate your vehicle in accordance with the vehicle manufacturer's recommended standards (refer to the vehicle manufacturer's handbook and service schedule).
- Not use engine brakes in residential areas.
- Try to avoid reversing whenever possible. If you cannot avoid it, use extreme caution.
- Ensure your vehicle is fitted with audible reversing alarms.
- Always follow posted signs as they provide vital clues to road conditions and characteristics.
- Always be aware of the following:
 - Reduce your speed in wet conditions
 - Drive cautiously in fog or heavy rain
 - Descend hills at signposted heavy vehicle speeds, or in the lowest gear to suit the conditions
 - Observe road work speed limits
 - Do not exceed the posted speed limit
 - Do not drive at speed past schools, school buses, playgrounds, shopping areas etc.
- Follow Vehicle Movement Plans that specify approved routes to and from work sites and site compounds. Only roads that are shown on the Vehicle Movement Plans may be used. The use of roads that are not shown on the Vehicle Movement Plans is strictly prohibited.
- Follow directions provided by a Sydney Program Alliance employee.
- Park within work sites and site compounds where possible. Parking on public roads is to be avoided. Where this is not possible, contact your Sydney Program Alliance contact to seek alternative arrangements.



DRIVER CODE OF CONDUCT

This Driver Code of Conduct is applicable 24 hours per day, seven days per week. Failure to comply with this Driver Code of Conduct will lead to either the issue of a non-conformance notice or disciplinary action if the offender is an employee of Sydney Program Alliance. If the offending person is employed by another organisation providing a service or product to Sydney Program Alliance, then a suspension or cancellation of a service contract or arrangement with that organisation may be considered.

Appendix A5 Heavy vehicle routes according to vehicle size

