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FINLEY BESS

OSOM Route Study

Date: April 2025
Client: Premise
Type: Desktop Survey
Rev: 1

Table of Contents

Revision History

Revision	Date	Details	Prepared	Checked	Approved
0	21/03/2025	First issue	ICW	SK	JJM
1	07/04/2025	Revised with client comments	ICW	SK	JJM

Disclaimer

This report has been prepared for advisory purposes only. Information provided within the report is based on data provided by the Client as well as publicly available information and, to the best of ARES Group's knowledge and experience, is accurate at the time of publication. All proposed routes, methodologies and schedules described in this report are subject to approval and issue of permits from the relevant stakeholders. Transport equipment is based on ARES Group vehicles and trailers, and swept path analysis results may differ if using equipment by third parties.

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Introduction

Finley BESS (or Battery Energy Storage System) is a renewable energy development located near the town of Finley in New South Wales. The facility has a proposed capacity of 100MW and storage of 200MWh and is currently in the planning and approvals stage.

The project is located approximately 5km west of Finley, in the Berrigan Shire Council area. It is ideally situated next to TransGrid's Finley substation servicing the town.

ARES have been tasked by our customer Premise to undertake a Route Survey from the Port of Melbourne to site. The purpose of the study is to determine the pinch points along the route and give best estimates of modifications and works required to enable oversize overmass (OSOM) cargo to be brought to site.

The study is designed for those involved in the project that have a limited knowledge of transportation, including a comprehensive outline of the routes and actions required to achieve delivery.

01

Overview

Project Overview

The Finley BESS is a renewable energy development near Finley in New South Wales currently in the planning and approvals stage.

Scope of Survey

Finley BESS is located just off the Riverina Highway, approximately 5km west of the town of Finley in NSW.

ARES has been tasked with surveying the route from the proposed Port of Import (Port of **Melbourne**) to the project site. The survey will include everything up to the site entrance. The turn into the site entry point will be assessed for swept path requirements for input into civil design.

This is a desktop survey, relying on existing aerial imagery from sources such as Google and Nearmaps. ARES has also previously driven large parts of the transport route as part of other assessments and has included data gathered from those trips in this assessment.

We recommend that a physical survey of the entire route is completed at a later stage, once the route is confirmed and final OSOM component dimensions are known, to verify the results of this desktop survey.

Port of Import

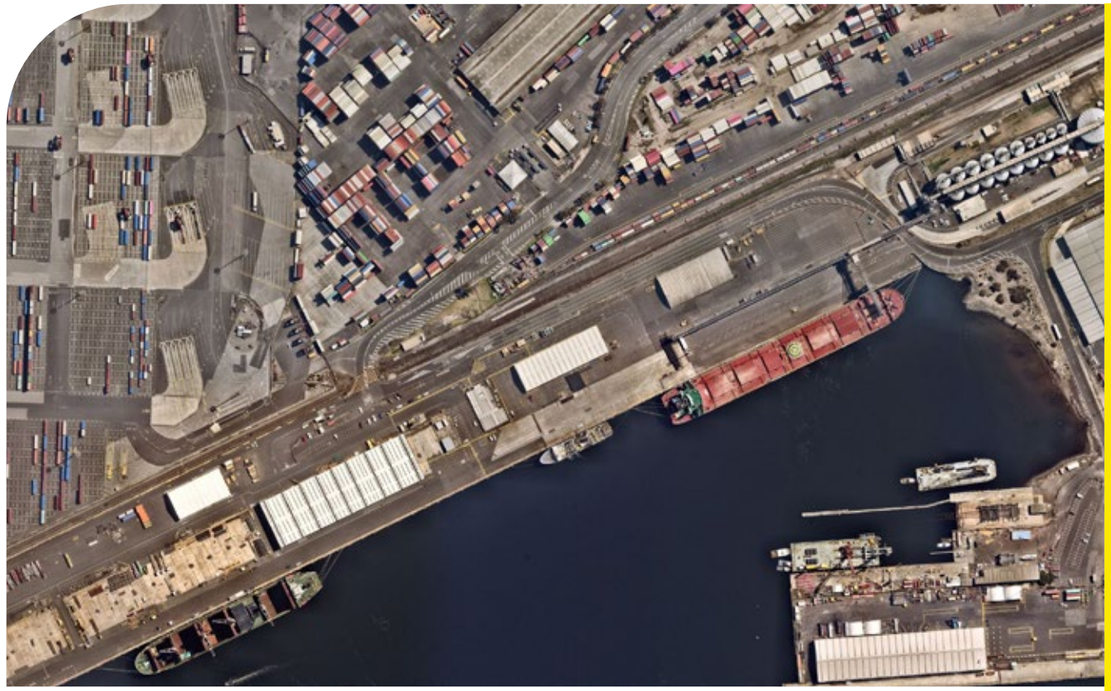
The Port of Melbourne serves as a vital import/export hub into the city of Melbourne and surrounds. There are several precincts within the Port - we have assumed that the transformer will be delivered to AAT Appleton Dock which has break bulk handling capability.

Following discharge from the ship and loading onto the transport combination, the load will navigate its way out of the facility via either Appleton Dock Rd to the north or Enterprize Rd to the north-east. Both are viable options and the final choice will come down to what constraints there are within the AAT facility on the day due to other stored cargoes.

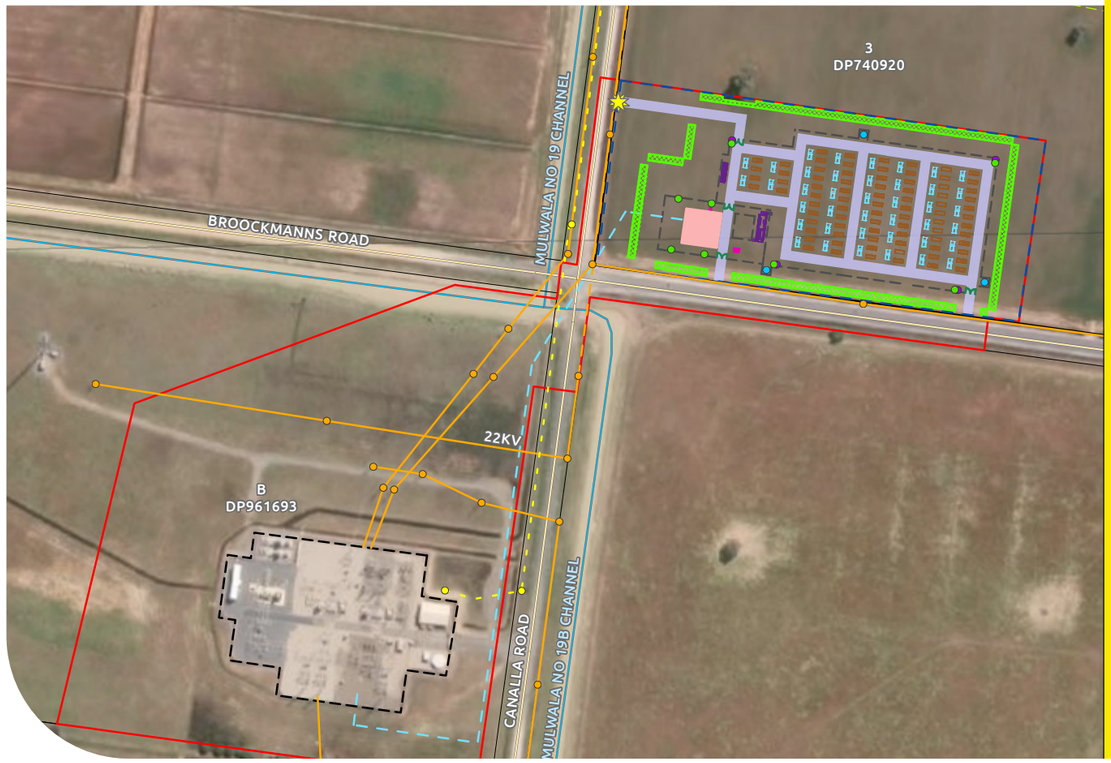
From Appleton Dock Rd there are excellent connections to the freight and overdimensional road network out of Melbourne via Footscray Rd, the OD5 route and then onto the Metropolitan Ring Road.

Site

The project site is situated on the corner of Canalla Rd and Broockmanns Rd, near the existing Finley substation. Refer to the opposite page for an overview of the project. The exact location of the transformer has not been finalised and will be determined during detailed design. Entry to site has not been finalised but new heavy vehicle access is expected to be constructed directly off Canalla Rd. Refer to the Appendix for an assessment of the site entry performed by Premise.



Above: Aerial view of AAT Appleton Dock at Port of Melbourne. **Below:** Site overview of the Finley BESS facility.



Transport Methodology

Specialised cargo requires specialised transport solutions.

Cargo Dimensions

The majority of deliveries to the project will be in gauge and able to be delivered under gazette. The largest oversize, overmass (OSOM) component of the project is the delivery of the one-off main transformer. The exact weights and dimensions of this load is yet to be finalised but the following has been provided by the client for the purposes of this route assessment:

- Length: 8.0m
- Width: 3.0m
- Height: 4.0m
- Weight: 129.4 tons

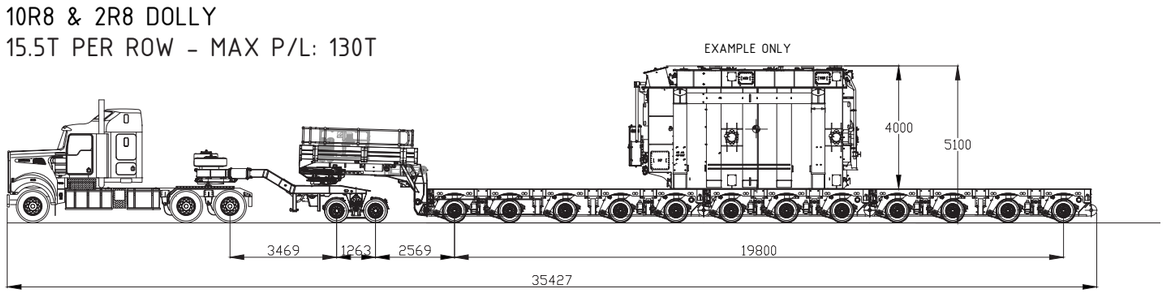
Equipment

The load can be transported on a platform trailer with dolly and hydraulic gooseneck.

Refer to the equipment schematic shown below for a mock-up of the proposed transport arrangement. Overall dimensions are:

- Length: 36m (excluding rear push truck)
- Width: 4.2m
- Height: 5.1m
- Gross Combination Mass: 210 tons
- Mass per Axle: 15.5 tons

This combination will be able to pass under all height restrictions on the proposed route, with the trailer able to hydraulically lower further by approximately 200mm for additional height clearance if required.
The transformer is classified as a 'High Risk' OSOM Load" by Transport for NSW due to its weight. An OSOM Transport Management Plan (TMP) will be required and approved by TfNSW prior to transport.



Pilots & Escorts

The load will be accompanied by 3x certified oversize pilot vehicles in Victoria and 3x oversize pilot vehicles in NSW, with no police or National Heavy Vehicle Regulator (NHVR) escort vehicles expected (subject to confirmation by the relevant authorities). The pilot vehicles will provide advanced warning (front and rear) of the OSOM load's approach.

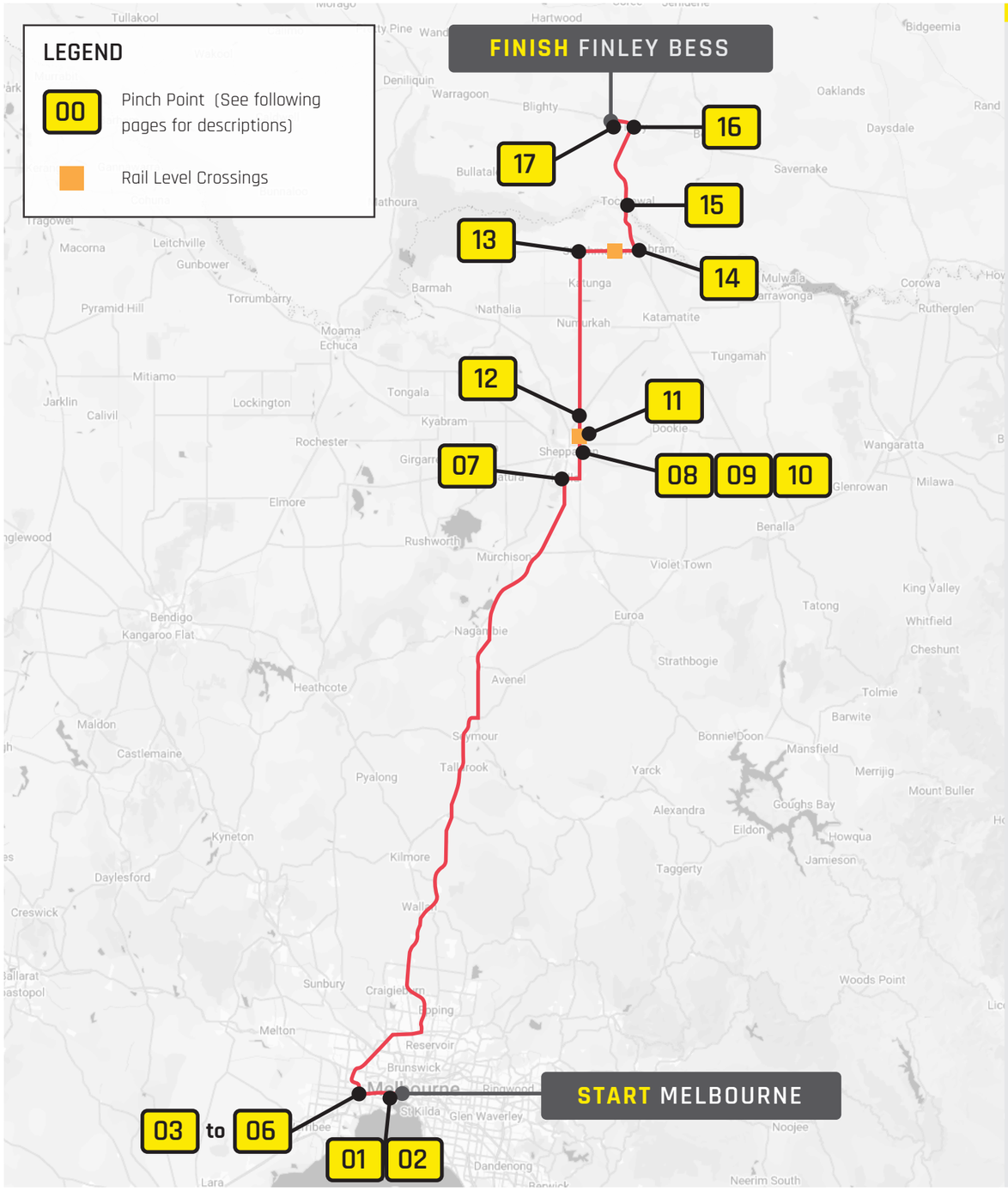
If any street furniture such as signs need to be removed for the load to pass, the pilots will perform this task and replace the items once the load is through.

Left:: Proposed transport equipment. **Above**: ARES transporting a 120-ton transformer on a platform trailer.

02

Route Assessment

Route Overview



ROUTE

	START - Port of Melbourne
0.0 KM	Appleton Dock Rd
1.2 KM	Footscray Rd
3.2 KM	Moreland/Whitehall St
4.4 KM	Somerville Rd
7.1 KM	Princes Hwy
11.3 KM	Little Boundary Rd
12.4 KM	Boundary Rd
13.3 KM	M80 Ring Rd
40.3 KM	Hume Fwy/Hwy
127.4 KM	Goulburn Valley Fwy/Hwy
196.2 KM	River Rd
205.6 KM	Doyles Rd
215.1 KM	Goulburn Valley Hwy
271.6 KM	Newell Hwy
307.2 KM	Riverina Hwy
313.2 KM	Canalla Rd
314.9 KM	**FINISH - Finley BESS**

The return journey is expected to be the reverse of the above.

INTERACTIVE MAP LINK

Rail Level Crossings

There are two rail level crossings on the route.

Grahamvale Rd level crossing
Line: Tocumwal line
Authority: V/Line
GPS: https://maps.app.goo.gl/qv2Ksh3uSy2UcSvB8

Murray Valley Hwy level crossing, Strathmerton
Line: Tocumwal line
Authority: V/Line
GPS: https://maps.app.goo.gl/DM8WtjFUzhb6Ciqj7

General Route Notes

Port of Melbourne to Finley BESS

Road Quality

The transport route will be primarily along the Victorian overdimensional route out of Melbourne, and VIC/NSW state highways, which are generally designed to a higher specification and able to handle heavier and higher volumes of traffic. The route is fully paved up to Canalla Rd, which becomes unpaved approaching the project site.

The route follows roads on the approved VIC OSOM Network and NSW OSOM Load Carrying Vehicle Network up to the Canalla Rd turn-off.

Overhead Structures

The 4.0m-high transformer will travel at a height of 5.1m as shown in the equipment schematic. The platform trailer has the ability to hydraulically lower further if required to give additional clearance to any low obstacles.

The main overhead obstacles are in metro Melbourne and along the Hume Hwy. A travel height of 5.1m will not be an issue along the route taken.

Overhead Power Lines

In general, a travel height below around 5.5m is not an issue with respect to power lines. Loads above 4.6m travel height will require a high load permit from the power authorities prior to travel. The authorities will advise whether a powerline survey is required at this travel height.

The route traverses through the Jemena, Ausnet and Powercor distribution networks in Victoria and the Essential Energy network in NSW.

Bridges and Culverts

Structures on state highways and roads are generally not a concern as they will be designed to handle heavy vehicle loads. Bridge assessments will still be required from the state road authorities (Victoria's Department of Transport and Planning (DTP) and Transport for NSW (TfNSW)) to confirm that bridges along the route can be crossed.

Axle weights are proposed to be 15.5 tons per row.

Rail Crossings

There are two rail level crossings along the route as detailed on the previous page.

Permissions will be required from rail authorities to travel through these crossings. Approvals may also be required when travelling over railway lines on bridges.

Road Works

There may planned roadworks and road upgrade projects along the route which will need to be considered when planning for transport of OSOM components to the Project.

A check of the Big Build Roads Victoria and TfNSW Projects websites showed no planned projects along the route at this stage. The West Gate Tunnel Project is ongoing in Melbourne but should be completed by the time this project commences

Close co-ordination with Department of Transport and Planning and Transport for NSW will be required once dates firm up for the project to ascertain which road

Above: Street view of Canalla Rd showing extent of paved surface from Riverina Hwy.

upgrade projects are active at the time of transport, and whether there are special conditions or access restrictions for OSOM loads (e.g. detours, speed restrictions, width restrictions etc).

Rest Stops

Rest stops have been assessed on page 54 of this document. There are several suitable options for truck parking which are sufficiently large to accommodate the transformer load.

Approvals

Transport permits will need to be obtained from the National Heavy Vehicle Regulator (NHVR) prior to travel. The permit process includes getting feedback from state transport authorities as well as any local councils along the route.

Third party approvals include electricity/telco authorities, rail/tram authorities, toll road and tunnel operators.

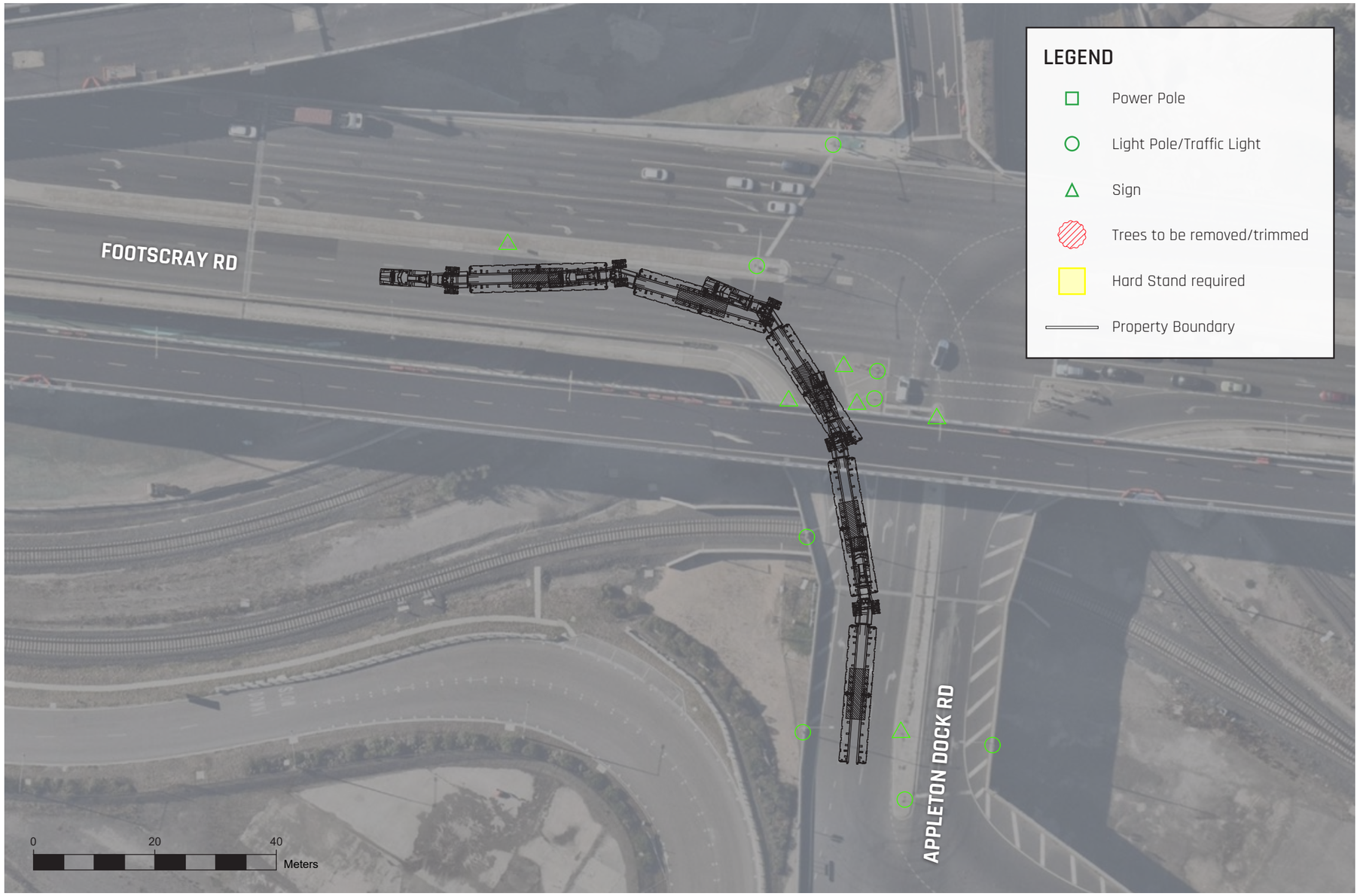
Pinch Point

01

LEFT TURN

Appleton Dock Rd & Footscray Rd

The OSOM load will exit the Port of Melbourne area via AAT Appleton Dock Rd then turn onto Footscray Rd. The turn is wide and can be done with no modifications.



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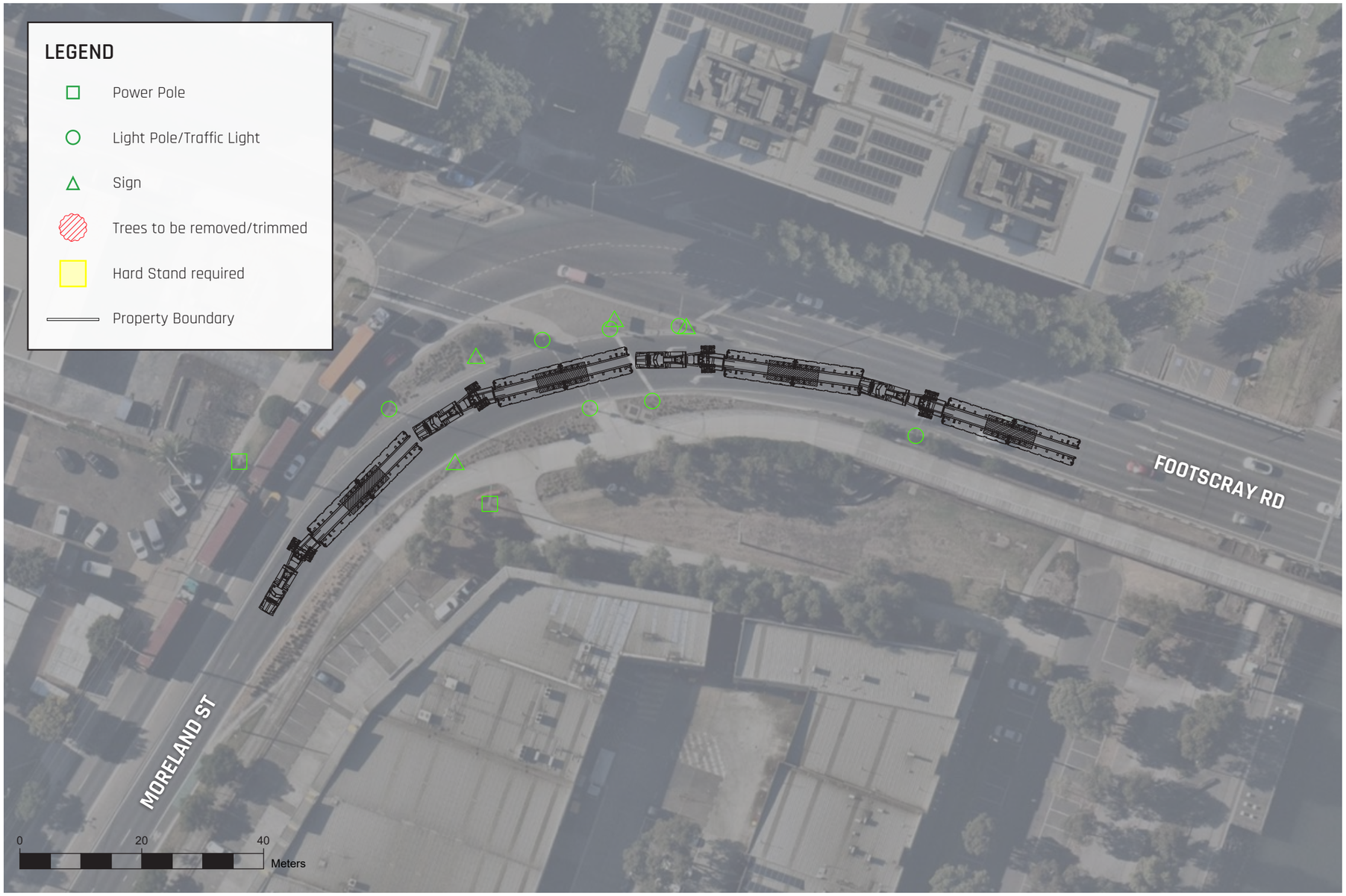
Pinch Point

02

LEFT TURN
Footscray Rd
& Moreland St

This turn is part of the OD route out of Melbourne and will require no modifications.



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Pinch Point

03

RIGHT TURN
Whitehall St &
Somerville Rd

This turn is part of the OD route out of Melbourne and will require no modifications.

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Pinch Point

04

RIGHT TURN

Princes Hwy & Little Boundary Rd

This turn is part of the OD route out of Melbourne and will require no modifications.

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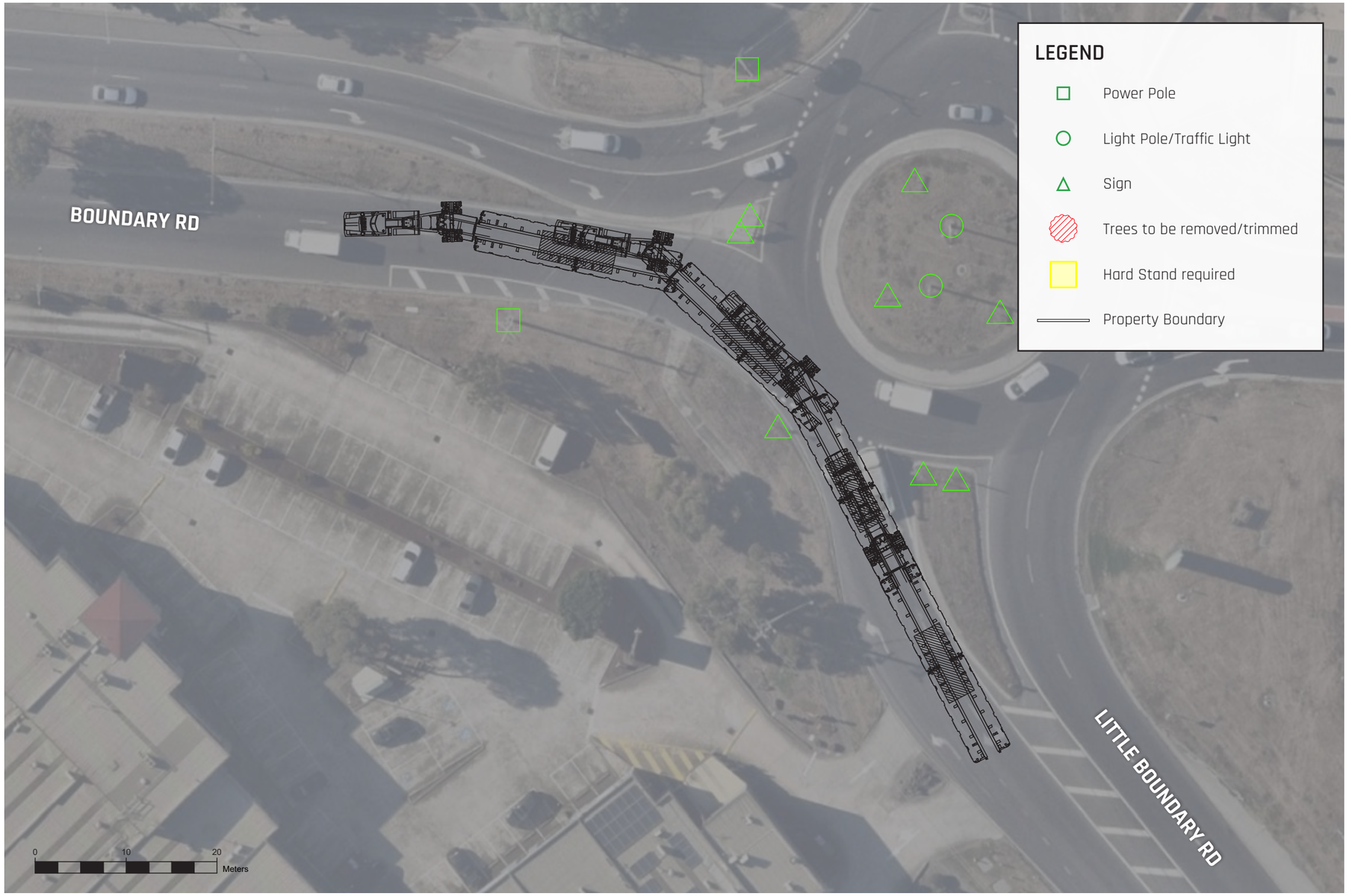
Pinch Point

05

ROUNDABOUT

Little Boundary Rd
& Boundary Rd

This turn is part of the OD route out of Melbourne and will require no modifications.



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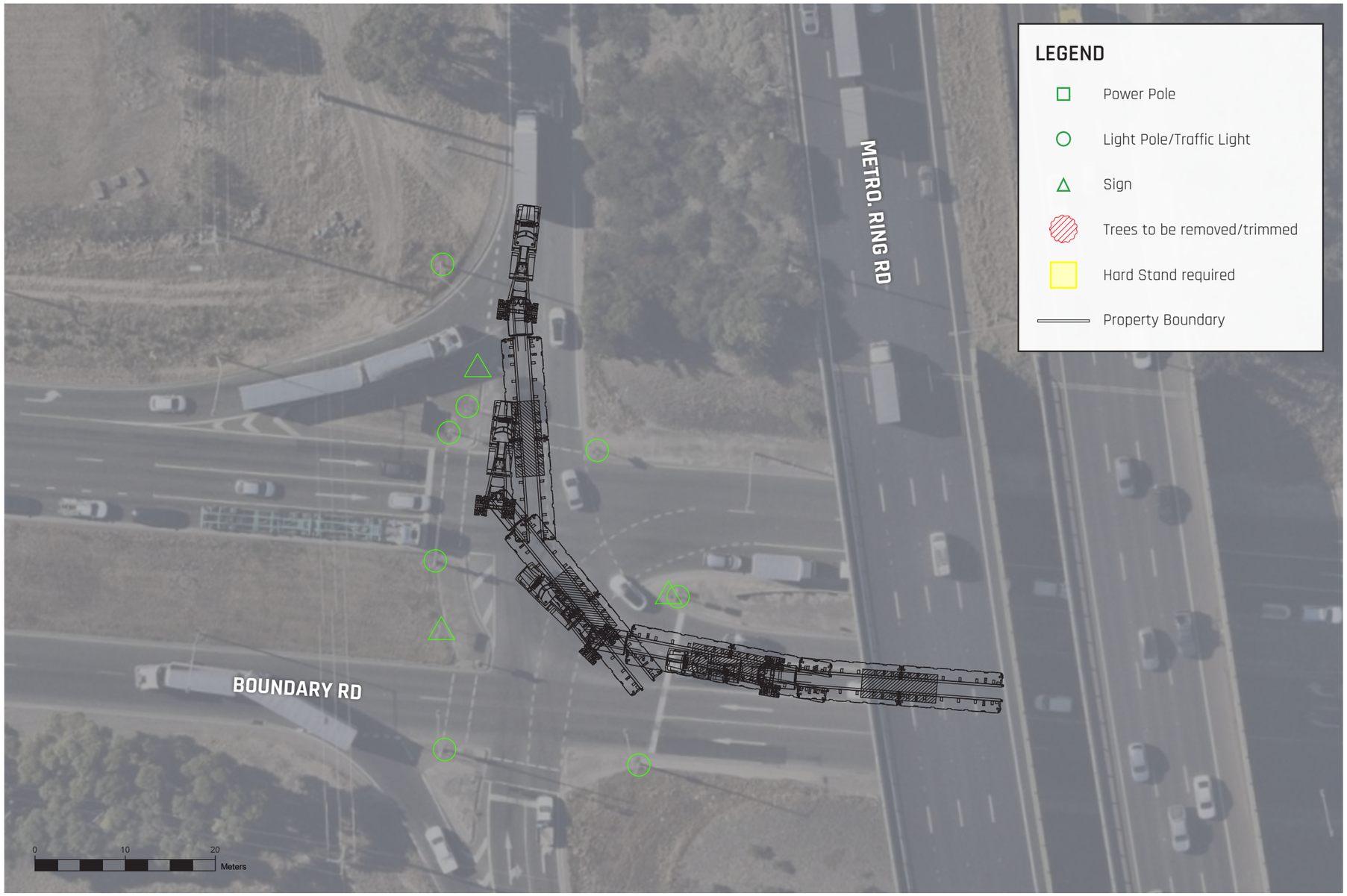
Pinch Point

06

RIGHT TURN

Boundary Rd & M80 Ring Rd

This turn is part of the OD route out of Melbourne and will require no modifications.



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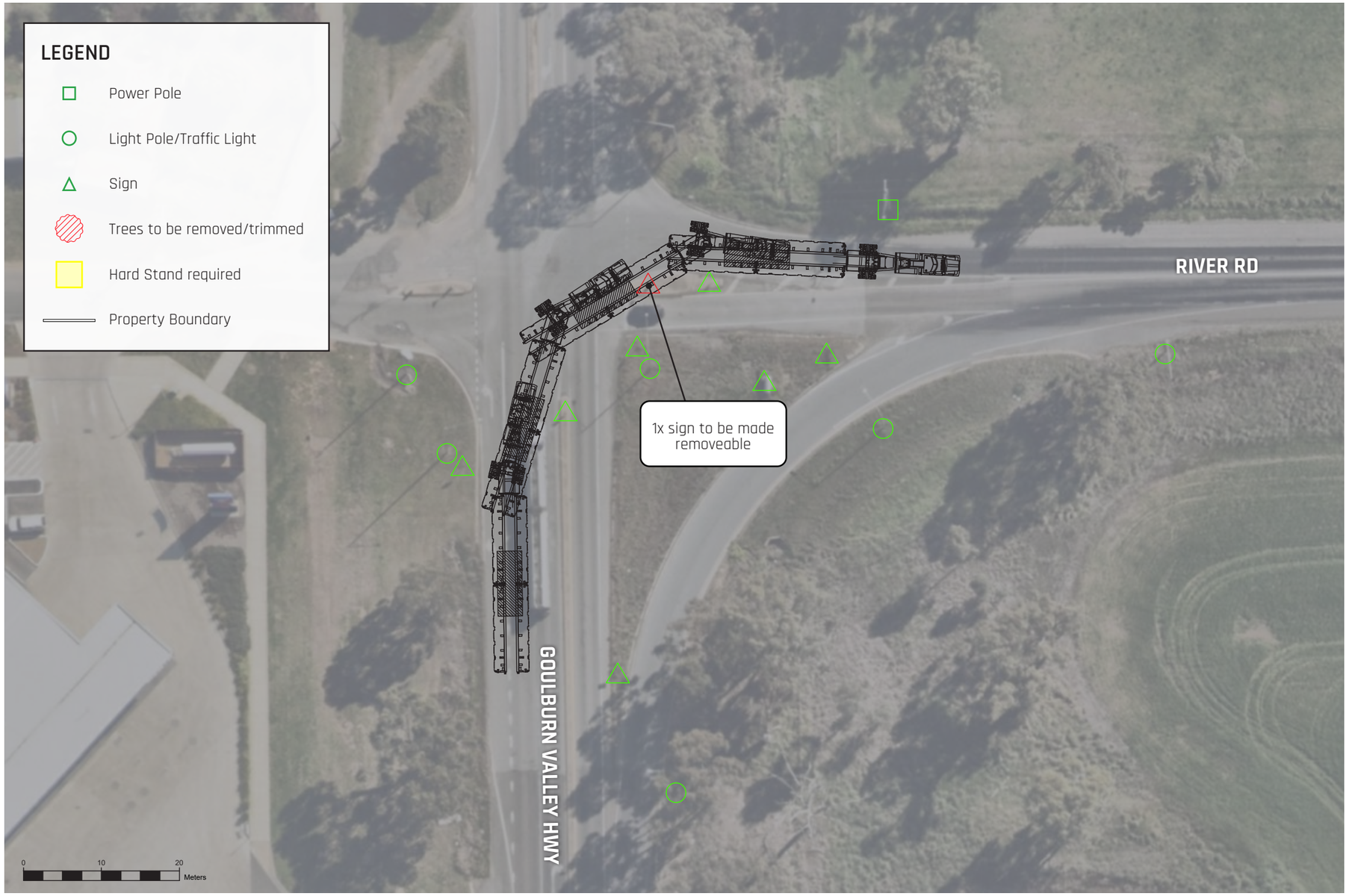
Pinch Point

07

RIGHT TURN

Goulburn Valley Hwy
& River Rd

Oversized loads approaching Shepparton need to bypass the centre of town via River Rd and Doyles Rd. The transformer load will need to go over the existing traffic island, with one sign requiring temporary removal.



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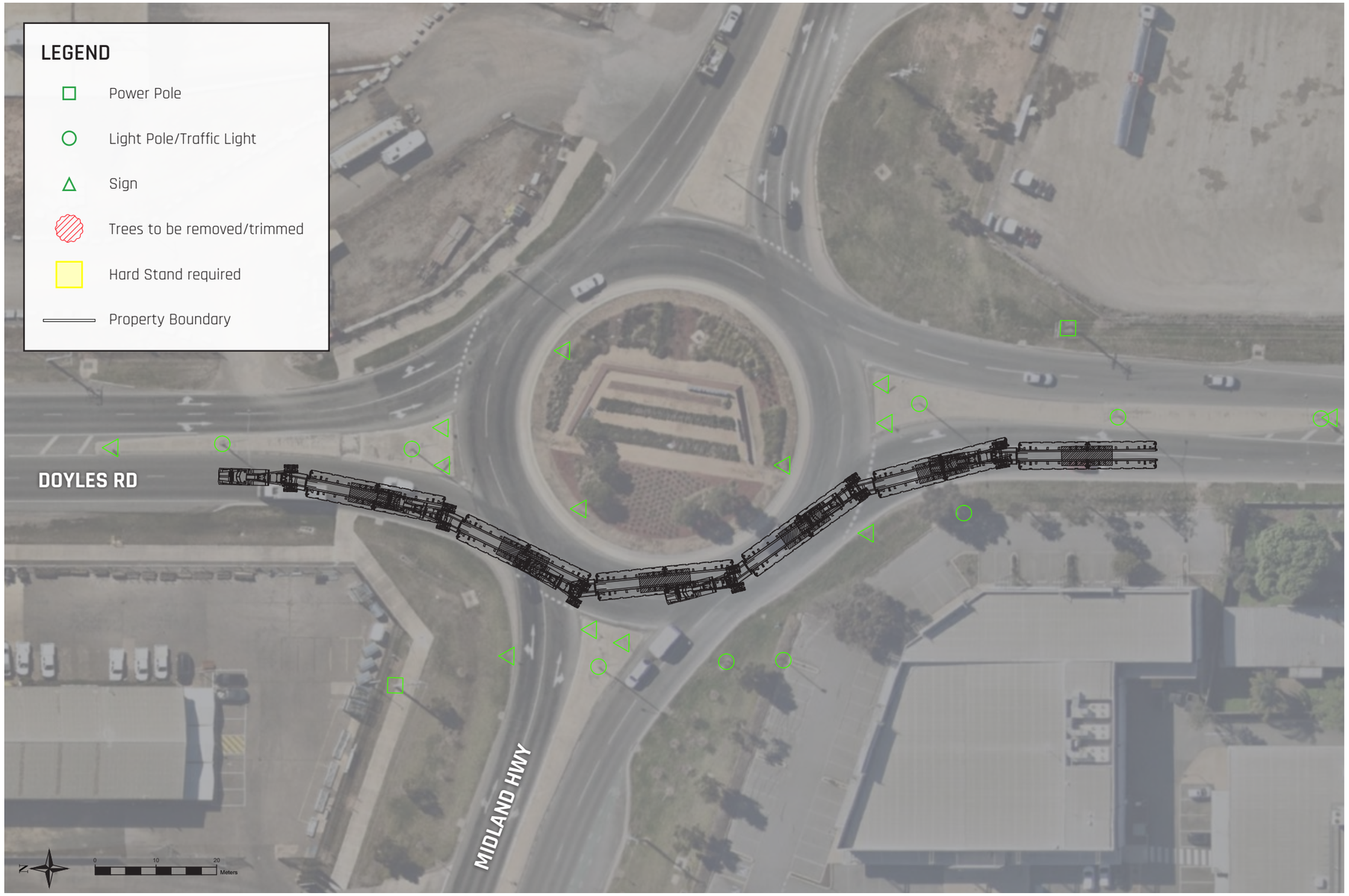
Pinch Point

08

ROUNDABOUT

Doyles Rd &
Midland Hwy

There are several roundabouts on Doyles Rd which have to be negotiated by the transformer load. Fortunately all of these are double lane and will require no modifications.



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Pinch Point

09

ROUNDABOUT

Doyles Rd & Old Dookie Rd

There are several roundabouts on Doyles Rd which have to be negotiated by the transformer load. Fortunately all of these are double lane and will require no modifications.

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Pinch Point

10

ROUNDABOUT

Doyles Rd &
New Dookie Rd

There are several roundabouts on Doyles Rd which have to be negotiated by the transformer load. Fortunately all of these are double lane and will require no modifications.

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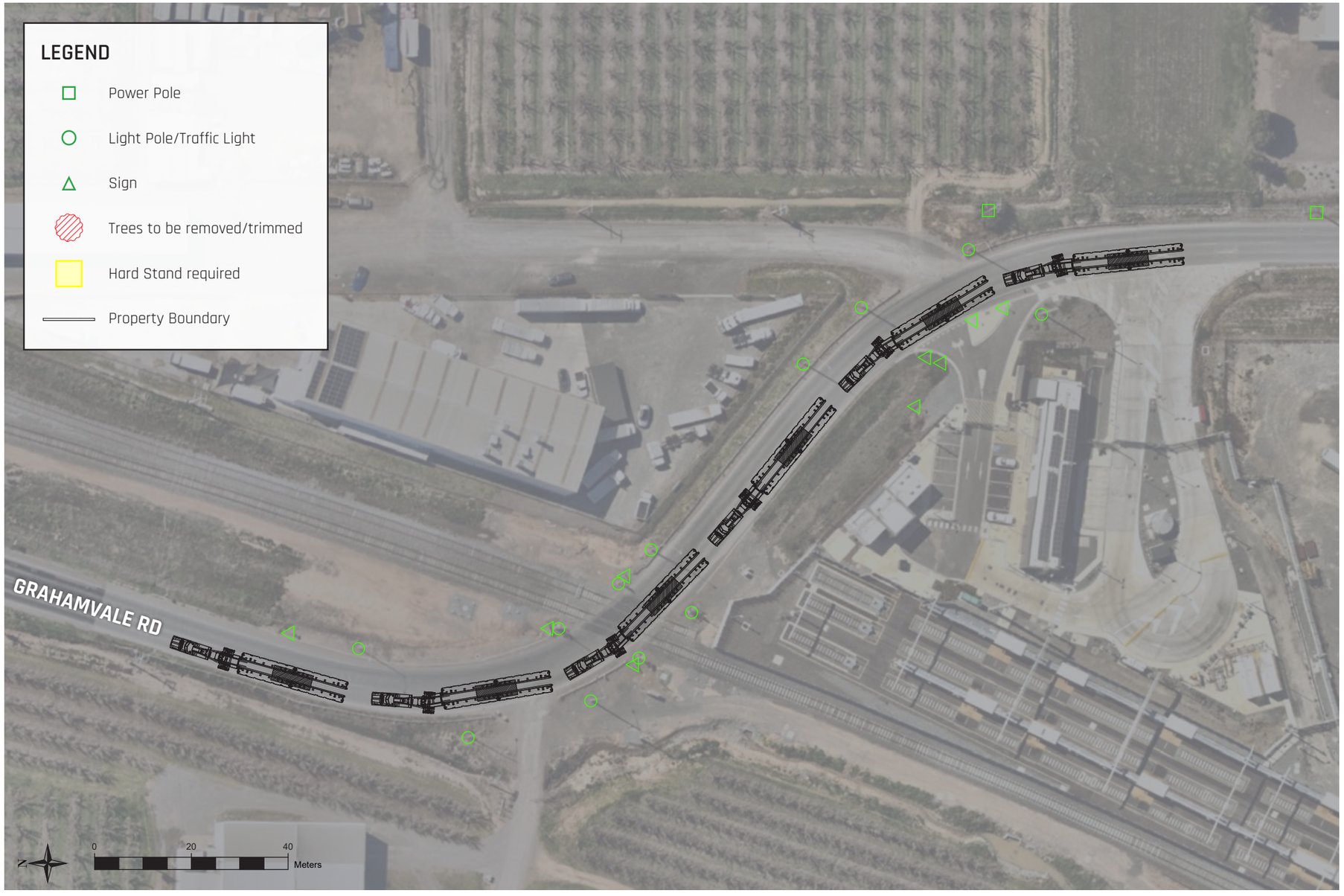
Pinch Point

11

RAIL CROSSING
Grahamvale Rd

The Grahamvale Rd rail level crossing can be taken with no road modifications. Due to the narrower width of road at this pinch point, pilots may need to hold any southbound traffic whilst the transformer makes its way through the crossing.



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Pinch Point

12

RIGHT TURN

Grahamvale Rd &
Goulburn Valley Hwy

There are no issues or modifications required at this turn.

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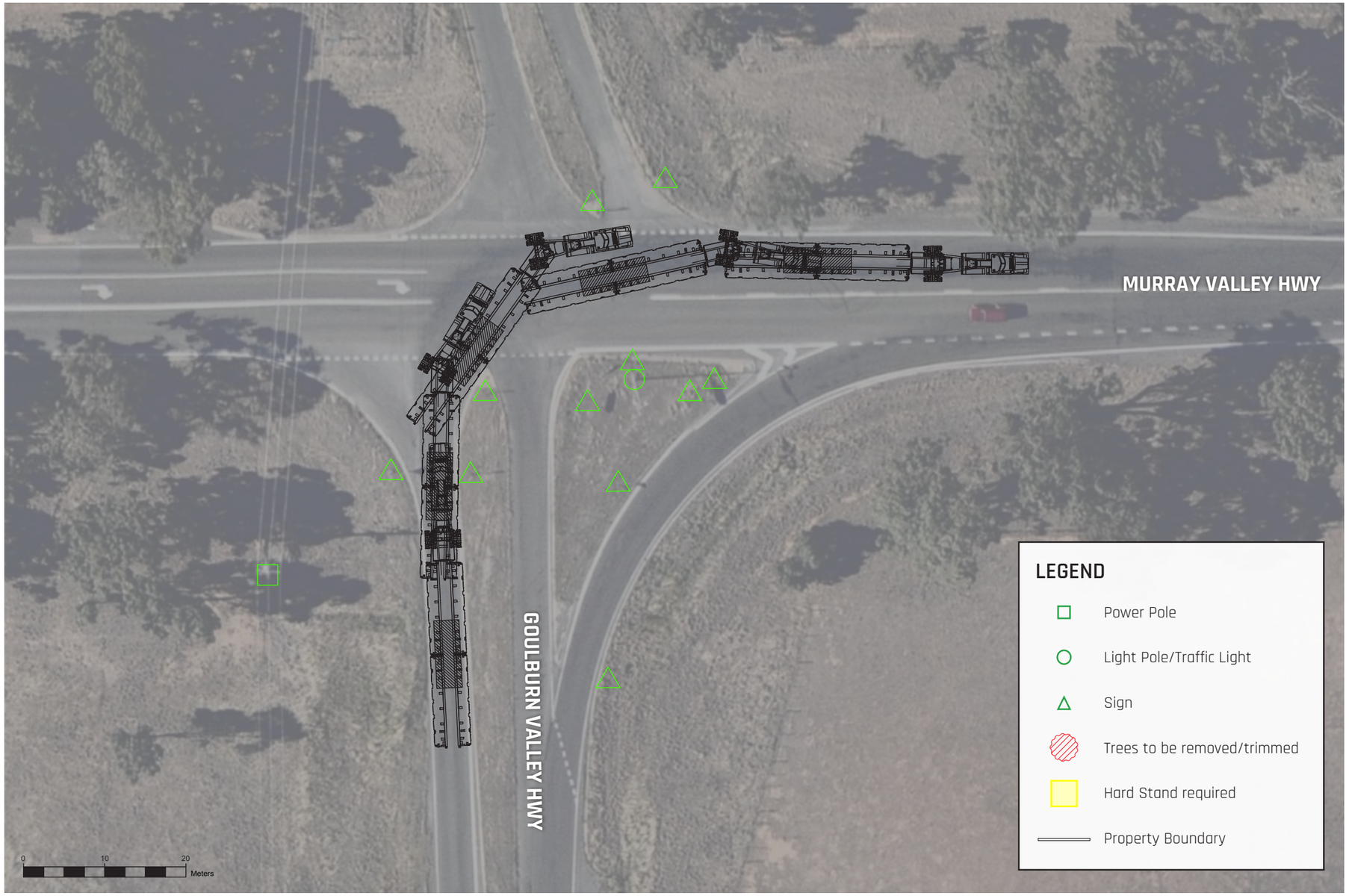
Pinch Point

13

RIGHT TURN

Goulburn Valley Hwy & Murray Valley Hwy

The transformer trailer can make this turn conventionally without any modifications.



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Pinch Point

14

LEFT TURN

Murray Valley Hwy & Goulburn Valley Hwy

The turn north towards the NSW border has a generous slip lane and can be taken with no modifications.

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Pinch Point

15

ROUNDABOUT
Newell Hwy,
Tocumwal

The roundabout at Tocumwal has an existing wide trafficable annulus and will not require any modifications.

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Pinch Point

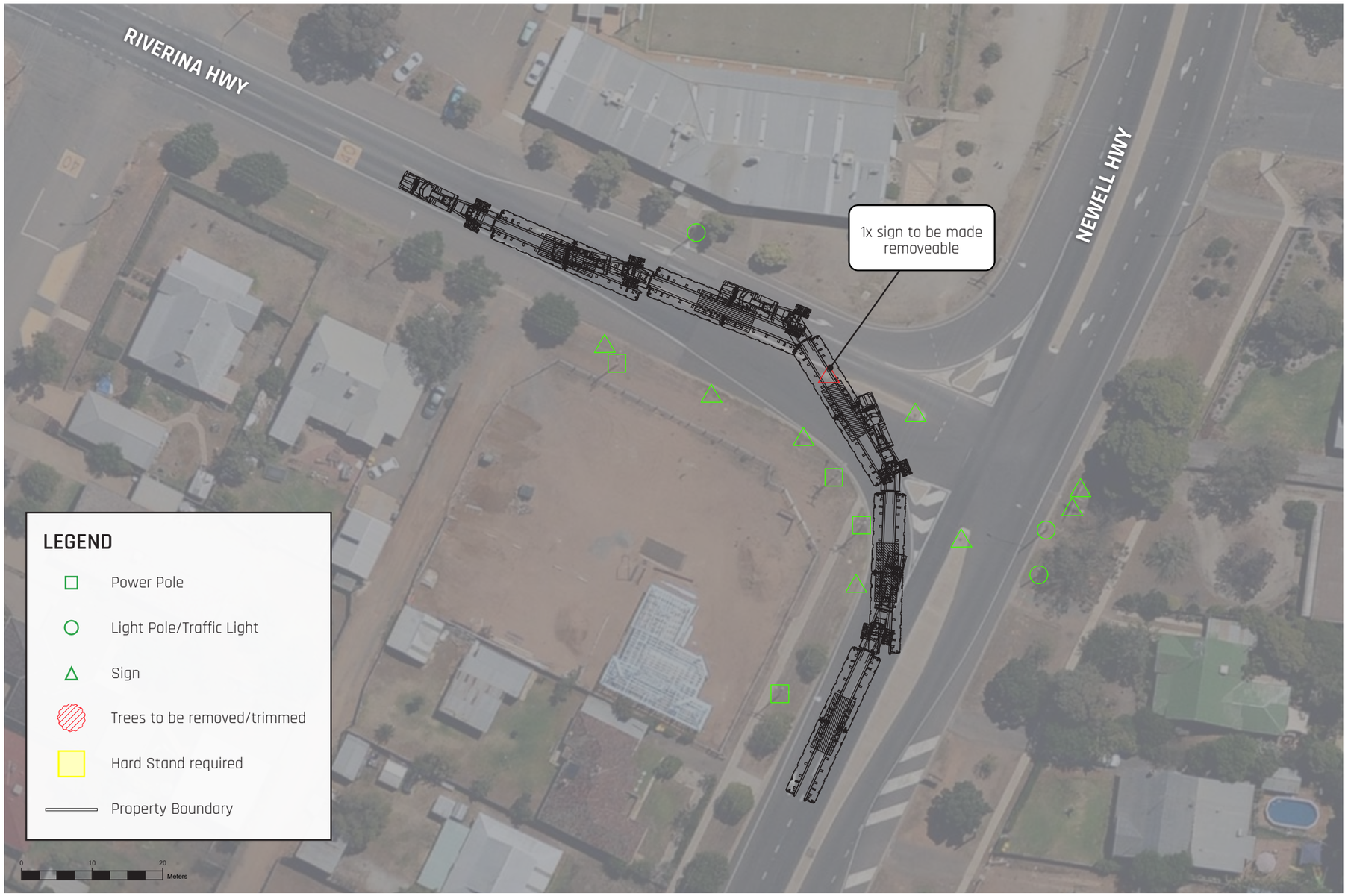
16

LEFT TURN

Newell Hwy & Riverina Hwy

At the town of Finley, the transformer will turn left onto the Riverina Hwy. The load will need to use the full width of the road to make the turn, including mounting the traffic island on Riverina Hwy, so pilots will need to control eastbound traffic on Riverina Hwy whilst the turn is being made.

One sign on the traffic island will need to be made removeable.



DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

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CUSTOMER:	Premise	SIZE:
PROJECT:	Finley BESS	SCALE NTS
DRAWING TITLE:	SWEPT PATH DRAWING	SHEET NO:
DRAWING NAME:	Route Survey	REV

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Pinch Point

17

LEFT TURN
Riverina Hwy
& Canalla Rd

To make the turn into Canalla Rd without any modifications, the trailer will need to use the full width of the Riverina Hwy. Traffic management/ control will need to be in place during this manoeuvre.

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

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Rest Stops

ARES expects the load to travel at an average speed of 40-50 kilometres per hour, including allowances for bridge slowdowns and manoeuvring at pinch points. With a trip distance of 320km, this means the journey should take around 6-7 hours of driving time.

We have assessed required rest stops based on fatigue management requirements and have proposed four stops to be used for this load per below. Please note that this is not meant to be an exhaustive list and there are other rest stops and pullover areas along the route which may be used for emergencies or breakdowns.

No.	KP	Rest Stop Name	GPS Link
01	60	Kalkallo Truck Parking	GPS
02	195	Kialla Rest Area	GPS
03	244	Numurkah Rest Area	GPS

The following pages show swept path analysis of each rest stop including ingress/egress, space requirements and any modifications required.

01 Kalkallo Truck Parking

02 Kialla Rest Area

03 Numurkah Rest Area

03

Conclusion

Conclusion

A brief outline of the report's major findings and any recommendations for actions.

> **...transport of OSOM components to Finley BESS is feasible.**

Summary

Following our desktop survey and analysis, ARES believe that transport of the oversize overmass (OSOM) components for the Finley BESS project from the **Port of Melbourne** is feasible along the proposed transport route, with only minor modifications required to make the route suitable for the OSOM load for the project, which is a one-off 130-ton transformer.

There are no issues with using the AAT berth at Appleton Dock to receive the cargo. This facility is well equipped to receive and process break bulk cargo and there is plenty of room to manoeuvre in the berth area. There is a well established route out of the port onto the overdimensional routes through and out of Melbourne.

The proposed transport route uses roads on the approved VIC OSOM Network and NSW Oversize Overmass Load Carrying Vehicles Network. The roads on these networks will be best equipped to handle the transformer load, although bridge assessments will still be required from both jurisdictions to ensure the infrastructure is suitable to cope with the axle loads proposed. Road modification requirements are very minor and limited the temporary removal of several signs and a small upgrade of the turn into Canalla Rd.

The height of the transformer allows it to be transported on a standard platform trailer and still be able to clear underneath bridges along the route. Powerlines should not be an issue although high load permits will still be required from the electricity authorities.

The project site is accessed off the Riverina Hwy via Canalla Rd. The exact access point into site has not been nominated but an indicative swept path analysis has been performed.

Next Steps

Based on the findings in this route survey, we recommend the following actions:

- Initiate dialogue with DTP and TfNSW regarding timing of major upgrade projects and any impacts
- Confirm final weights and dimensions of selected transformer
- Confirm location and design of site access point
- Conduct a physical survey of the route to validate the results of this desktop survey closer to transport date

Level Crossing Removal Project

A 125-ton, 25m-long precast concrete U-trough is unloaded at its destination after travelling through the heart of metropolitan Melbourne.

04

Appendix - Site Entrance Assessment

INDICATIVE ONLY - NO SURVEY AVAILABLE

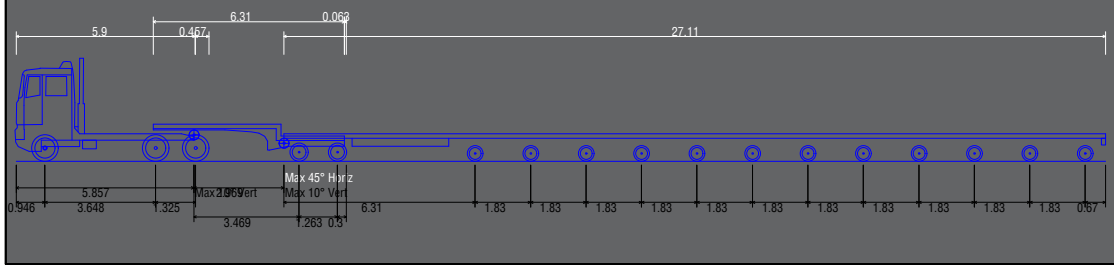
Brockman Road

Canalla Road

Brockman Road

Canalla Road

Canalla Road



12x8 semi modular steerable trailer 36m	
Overall Length	35.936m
Overall Width	4.000m
Overall Body Height	3.408m
Min Body Ground Clearance	0.332m
Max Track Width	4.000m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m

Wheel Path (Forward Vehicle Motion)

Vehicle Chasis Envelope (Forward Vehicle Motion)

Wheel Path (Reverse Vehicle Motion)

Vehicle Chasis Envelope (Reverse Vehicle Motion)

LEGEND

NO	DATE	AMENDMENT
B	01-04-2025	ISSUED FOR REVIEW
A	27-03-2025	ISSUED FOR REVIEW

PROJECT:
Finley BESS

TITLE:
Vehicle Turning Circle Plan - 12x8 semi modular steerable trailer

DRAWING NUMBER:
KC01999.000_S23

DRAWN BY:
A.M.

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