

MAISON DIEU SOLAR FARM

OSOM Route Study

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Client: Matilda Wachsmann
Terrain Solar
Type: Physical Survey
Rev: 2

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Revision History

Revision	Date	Details	Prepared	Created	Approved
0	19/01/2024	First issue	ICW	ICW	JJM
1	12/03/2024	Revised with client comments	ICW	ICW	JJM
2	15/05/2024	Revised with new figures and images	ICW	ICW	JJM

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Introduction

Maison Dieu Solar Farm is a renewable energy development located near Singleton in New South Wales. The solar farm has a proposed capacity of 60MWac and is currently in the planning and approval stage.

The project is located approximately 10km north-west of Singleton, in the New England region of NSW. It is situated directly opposite an Ausgrid substation, giving direct access to the 330kV and 132kV transmission networks.

ARES have been tasked by our customer, Terrain Solar, to undertake a Route Survey from the Ports of Newcastle and Port Botany 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 Maison Dieu Solar Farm is a renewable energy development in the New England region currently in the planning and approvals stage.

Scope of Survey

Maison Dieu Solar Farm is located along Maison Dieu Road, off the New England Highway, approximately 10km north-west of the town of Singleton in NSW.

ARES has been tasked with surveying the route from two Ports of Import (Port Botany and Newcastle) 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.

ARES physically drove the routes from 11-12 December 2023. The aim of the drive was to visually verify the results of an initial desktop study, take physical measurements and obtain drone footage at pinch points where the existing aerial imagery from sources such as Google and Nearmaps was of insufficient quality.

Ports of Import

The Port of Newcastle serves as a vital import/export hub into much of northern and central-west NSW. Much of its operation is driven by coal exports via Kooragang Island. However in recent years the port has invested heavily in expanding and diversifying its capabilities to handle a variety of other cargoes and ships.

The primary berth for break bulk cargo is Mayfield Berth 4, which has a large storage area (~120,000sqm) adjacent to the berth. RORO cargo is delivered to the Western Basin general cargo precinct. It is not clear

at this stage which terminal the oversize, overmass (OSOM) cargo for the project will arrive at, but we do not anticipate any issues receiving cargo or getting out of the port area from either precinct.

Port Botany is Sydney's primary import hub, handling millions of containers as well as bulk liquids. There are smaller facilities which can handle break bulk cargo although the volume is relatively low.

Height restrictions around the port are the main constraint, with numerous low bridges and tunnels surrounding the port area. Loads will have to make their way around the Sydney Metro area and join up with the freeway north to Newcastle before heading to site.

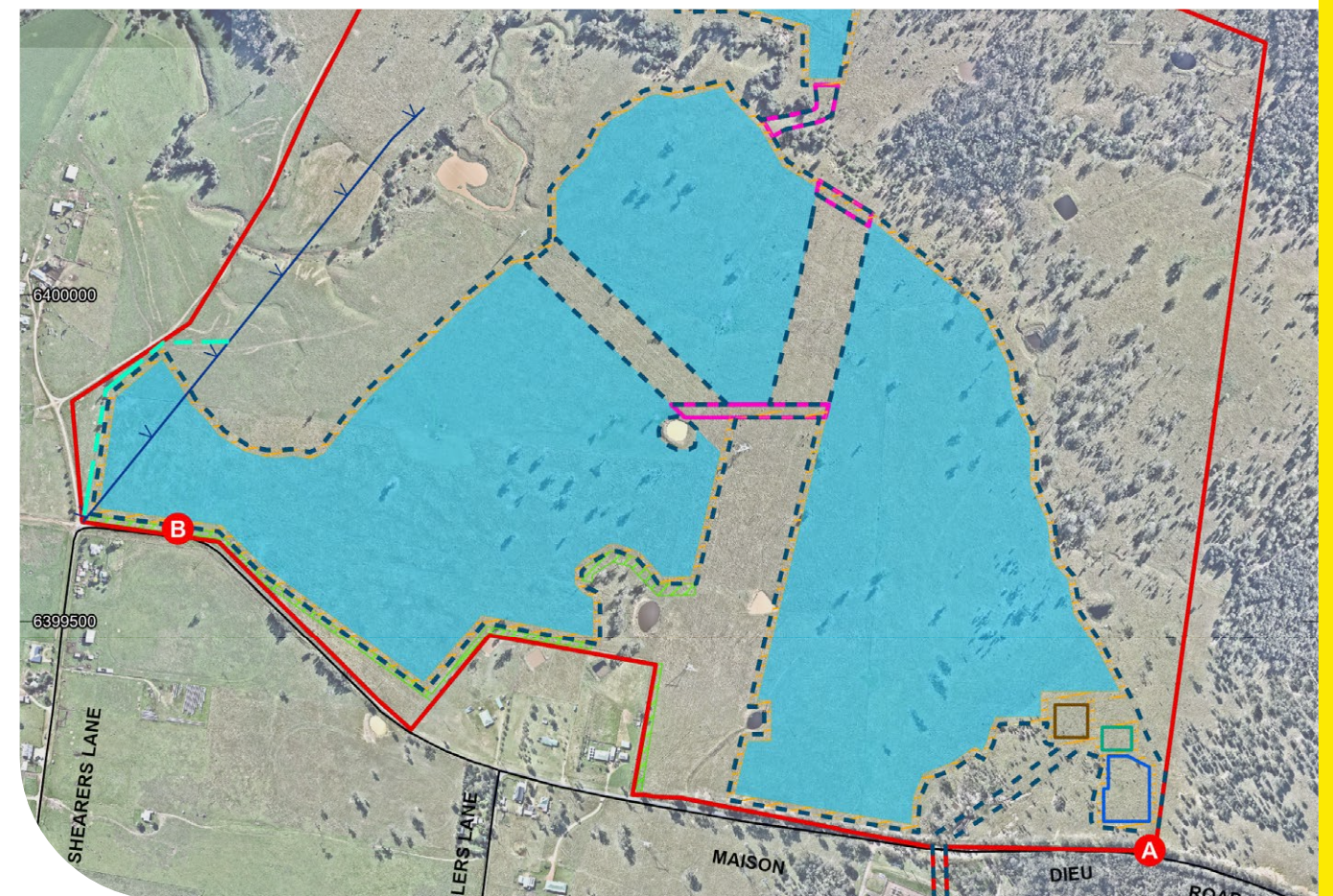
Site

The project site is accessed via Maison Dieu Road, which is directly connected to the New England Hwy just north-west off Singleton. The site entrance is roughly 8km from the highway, approximately 400m east of the Ausgrid Singleton Substation. The road is paved all the way to the site entrance point.

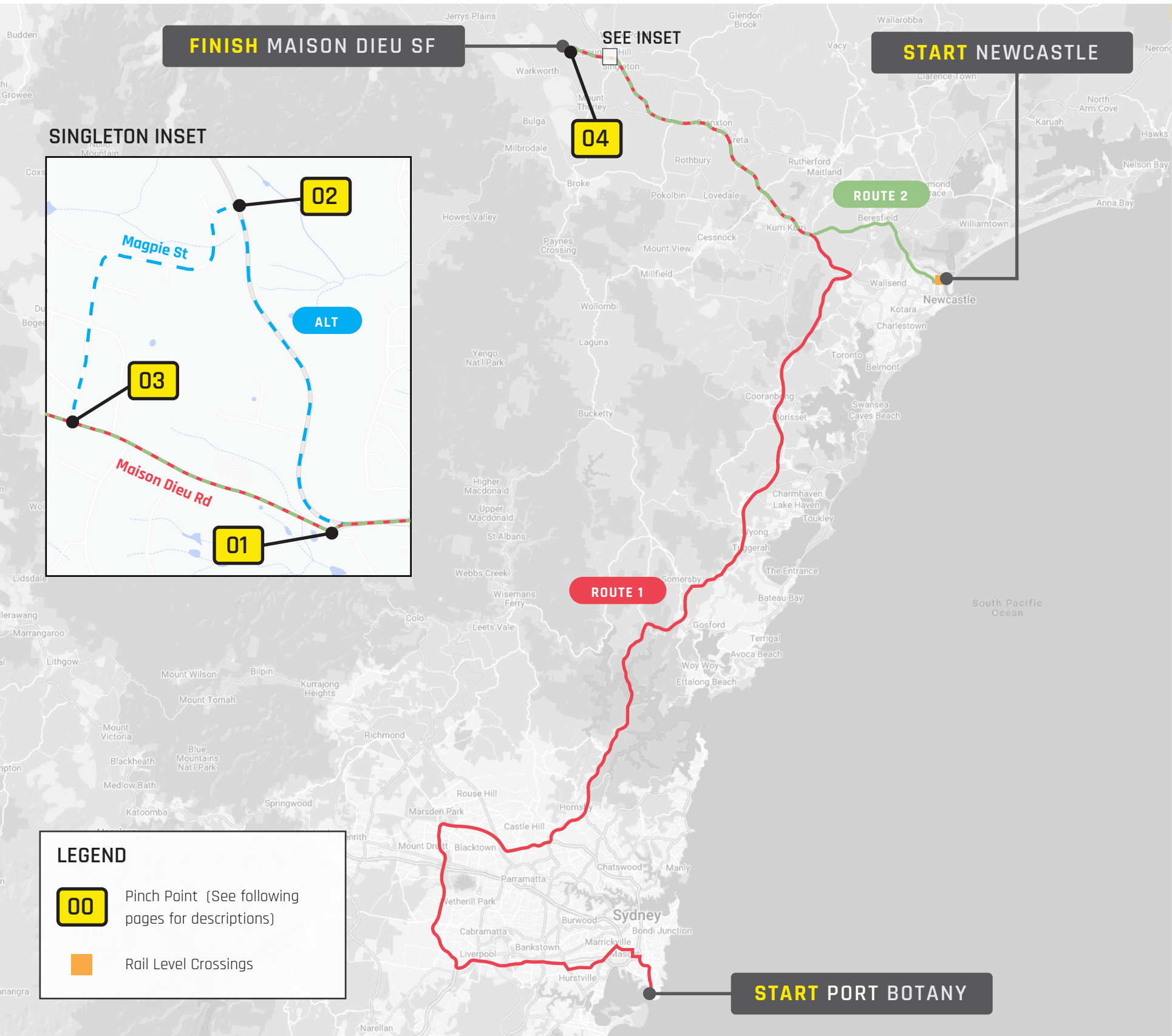
A design of the site entrance has not been sighted by ARES, so we have assessed the amount of modifications required to turn the largest cargo items into site. The solar farm substation where components will be delivered is located in close proximity to the site entrance.



Above: Aerial view of Port of Newcastle, Mayfield Berth 4. Below: Site overview of Maison Dieu Solar Farm including OSOM access location (marked A).



Route Overview



ROUTE 1 - EX BOTANY

	START - Port Botany
0.0 KM	Bumbarah Point Rd
0.6 KM	Botany Rd
1.3 KM	Beauchamp Rd
2.0 KM	Denison St
3.3 KM	Wentworth Ave
6.5 KM	Botany Rd
8.1 KM	Gardeners Rd
9.1 KM	Kent Rd/Canal Rd
10.5 KM	Princes Hwy
14.2 KM	Forest Rd
16.8 KM	Stoney Creek Rd
20.8 KM	King Georges Rd
21.9 KM	M5 Mwy
40.0 KM	M7 Mwy
80.4 KM	M2 Mwy
89.0 KM	M11 NorthConnex
(89.0 KM	Pennant Hills Rd)*
95.4 KM	M1 Mwy
212.4 KM	Hunter Expy
261.2 KM	New England Hwy
274.3 KM	Maison Dieu Rd
282.4 KM	FINISH - Maison Dieu SF

*Overheight loads over 5.1m high cannot take the NorthConnex tunnel and have to take Pennant Hills Rd to Wahoonga before turning onto the M1 Motorway.

ROUTE 2 - EX N'CASTLE

	START - Newcastle
0.0 KM	Quayside Cl
0.5 KM	Selwyn St
1.9 KM	George St
2.0 KM	Industrial Dr
13.3 KM	Pacific Hwy
18.2 KM	John Renshaw Dr
30.3 KM	Hunter Expy
67.8 KM	New England Hwy
80.9 KM	Maison Dieu Rd
89.0 KM	FINISH - Maison Dieu SF

The dogleg turn at New England Hwy and Maison Dieu Rd (Pinch Point 01) in Singleton can be bypassed if required using Maggie St. Refer to blue "ALT" route in the inset. This ALT route works for both Routes 1 and 2.

General Route Notes

Port Botany & Newcastle to Maison Dieu Solar Farm

Road Quality

The transport routes will be primarily along the NSW state highway and motorway network, which is generally designed to a higher specification and able to handle heavier and higher volumes of traffic. The routes are fully paved, including the “ALT” bypass option via Magpie St.

Both routes as well as the ALT route are on the approved NSW OSOM Load Carrying Vehicle Network.

Overhead Structures

Overheight loads are difficult to bring out of Port Botany due to a multitude of bridges and tunnels within the Sydney metro area. The lowest of these is the NorthConnex (M11) tunnel, which has a height limit of 5.1m. The tunnel can be bypassed using Pennant Hills Rd.

Newcastle has better height clearances and the lowest unbypassable structure on the route is the Gowrie Gates railway bridge just before the Maison Dieu intersection with New England Hwy, at 5.6m high.

Overhead Power Lines

In general, a travel height below around 5.5m is not an issue with respect to power lines. Loads above 5.2m travel height will require a high load permit from the

power authorities prior to travel.

Due to the height of the components being less than 5.2m loaded, an overhead line survey should not be required. However, we recommend checking with the power authorities once transport dates are confirmed to ensure this is the case.

The route traverses through the Ausgrid distribution network.

Bridges and Culverts

Structures on state highways are generally not a concern as they will be designed to handle heavy vehicle loads. However, the route does use some local council roads - namely Maison Dieu Rd and Magpie St. Any structures on these roads will have to be assessed by the local councils (Singleton Council) and travel over the structures will be subject to council approval.

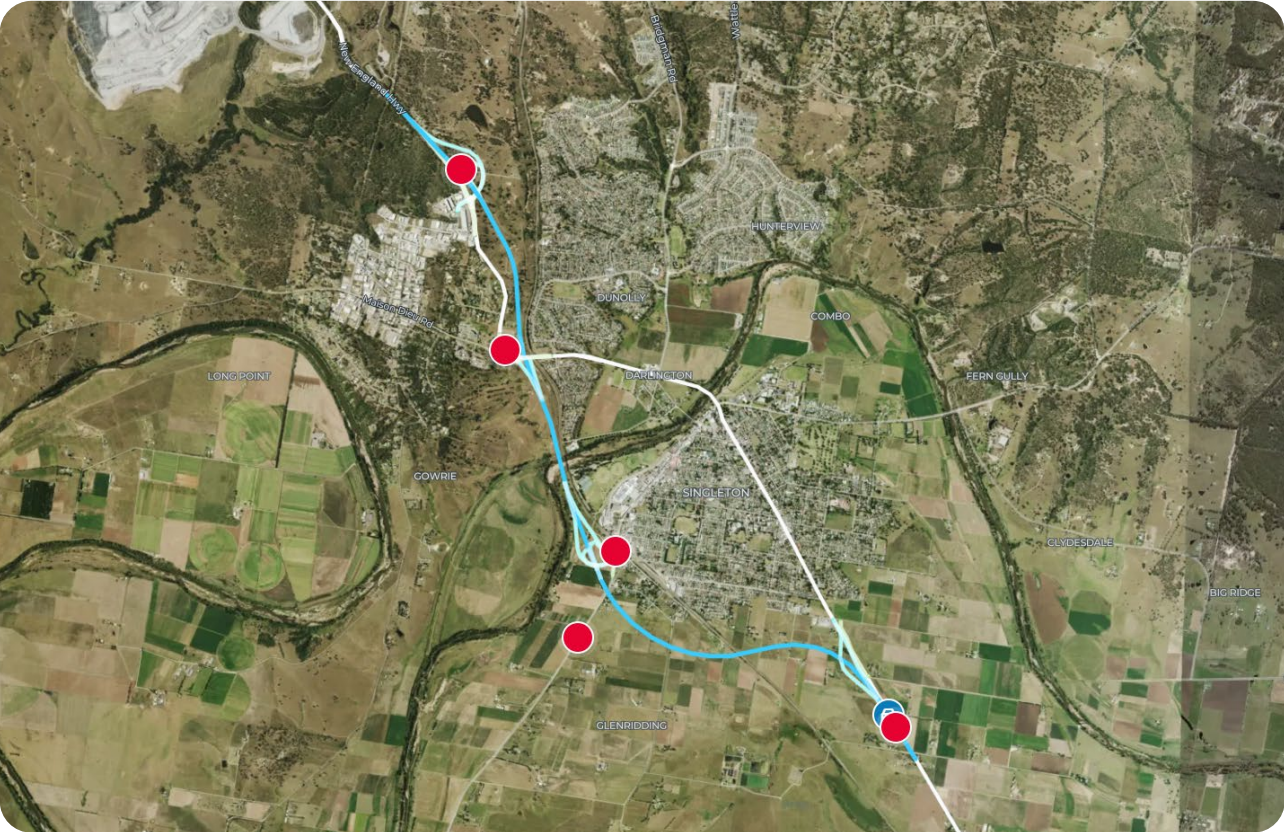
Rail Crossings

There are rail level crossings along the route. 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 are planned roadworks and road upgrade projects along the route which will need to be considered when planning for transport of OSOM components to the Solar Farm. These include:

- Pacific Hwy, Hexham Straight Widening project - addition of extra lane each direction, new Ironbark Crk bridges. Scheduled to finish in 2026.
- Singleton Bypass - Construction of new road and bridges around the west of Singleton. Includes modifications to corner of Maison Dieu Rd and New England Hwy to include a new roundabout. Estimated finish date is end of 2026.
- M5 Moorebank Ave upgrades - currently in planning



Above: Proposed route for Singleton Bypass (source: Transport for NSW)

phase, estimate 2027-28 timeframe for completion.

- M7 Widening - adding an extra lane between Prestons and Glendinning. Scheduled to be complete in 2026.

Close co-ordination with Transport for NSW will be required once dates firm up for the project to ascertain which 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).

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.



Above: M11 NorthConnex tunnel entrance at Pennant Hills - 5.1m height restriction

Below: Rail overpass at Gowrie Gates north west of Singleton - 5.6m height restriction



Transport Methodology

Specialised cargo requires specialised transport solutions.

Cargo Dimensions

The majority of deliveries to the Solar Farm will be in gauge and able to be delivered under gazette. The oversize, overmass (OSOM) component of the project is the delivery of the two (2) electrical switchrooms with the following weights and dimensions:

- Length: 20m
- Width: 5.0m
- Height: 4.5m
- Weight: 20-30 tons

There is also a main transformer to be transported but its weight and dimensions mean that it can be transported on a low loader trailer under gazette notice.

Equipment

The height and width of the cargo are the main restrictions for transport along the route.

The switchrooms have to be transported on extendable low loaders due to their length and height. These are somewhat specialised but still easy enough to source from any heavy haulage company. These loads will require two (2) accompanying pilot vehicles due to their width. A Class 1 transport permit will have to be applied for. Overheight travel permits from Ausgrid may also be required.

The laden dimensions of the loads will be as follows:

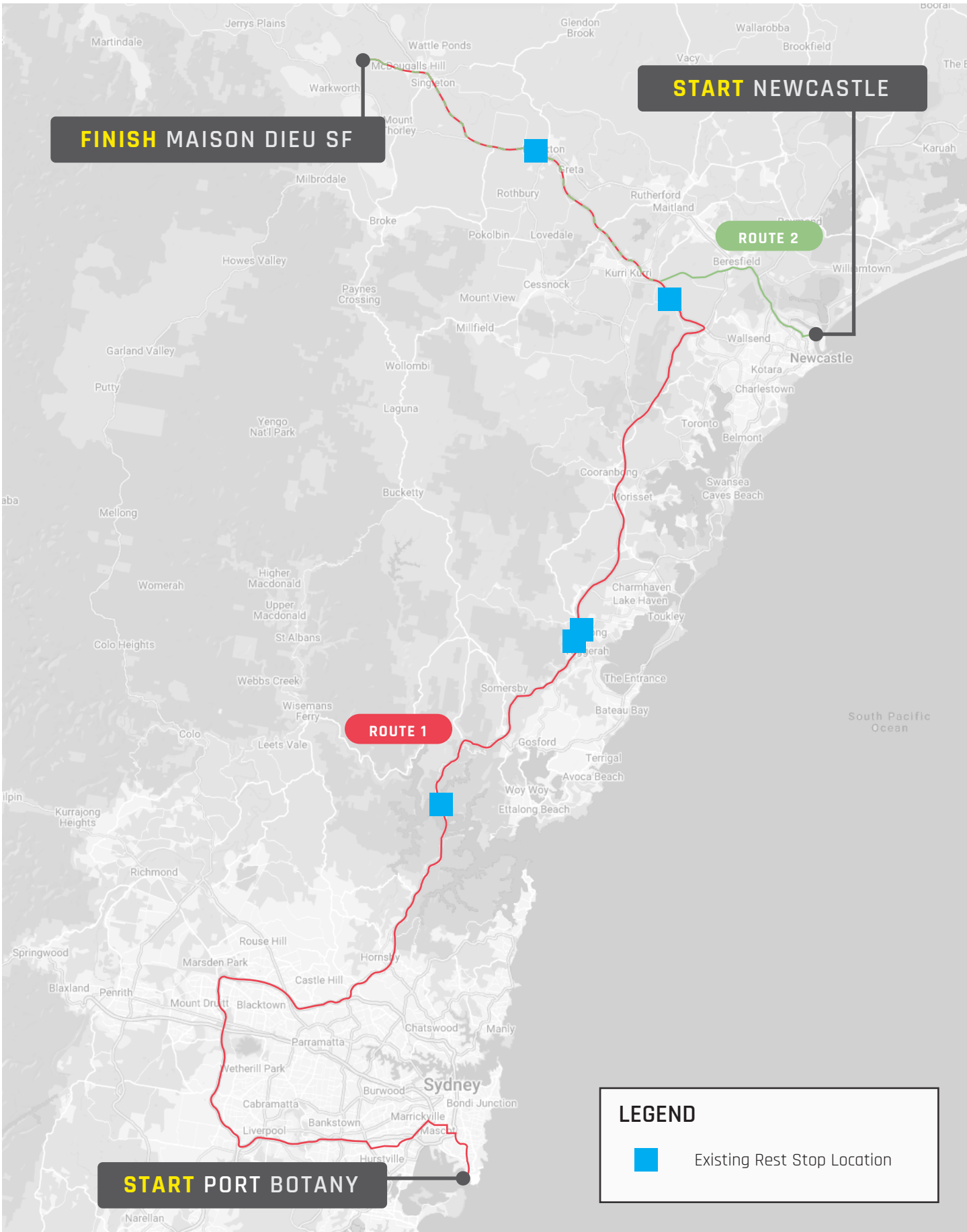
- Overall Length: 30m
- Overall Width: 5.0m
- Overall Height: 5.2m
- Gross Combination Mass (GCM): 65-75 tons

Rest Stops

The map to the right shows the location of rest stops which may be used during transport of the components. These are also listed below along with KP's from Port Botany (Route 1).

- KP 121 - Mooney Mooney rest area
- KP 164 - Alison truck parking area
- KP 166 - Wyong service centre
- KP 222 - Wattaka rest area
- KP 253 - Branxton rest area

There are also numerous emergency stopping bays along the highways and motorways which can be used in exceptional circumstances such as breakdowns and emergencies, or to let queued traffic behind the load pass.



Pinch Point

01

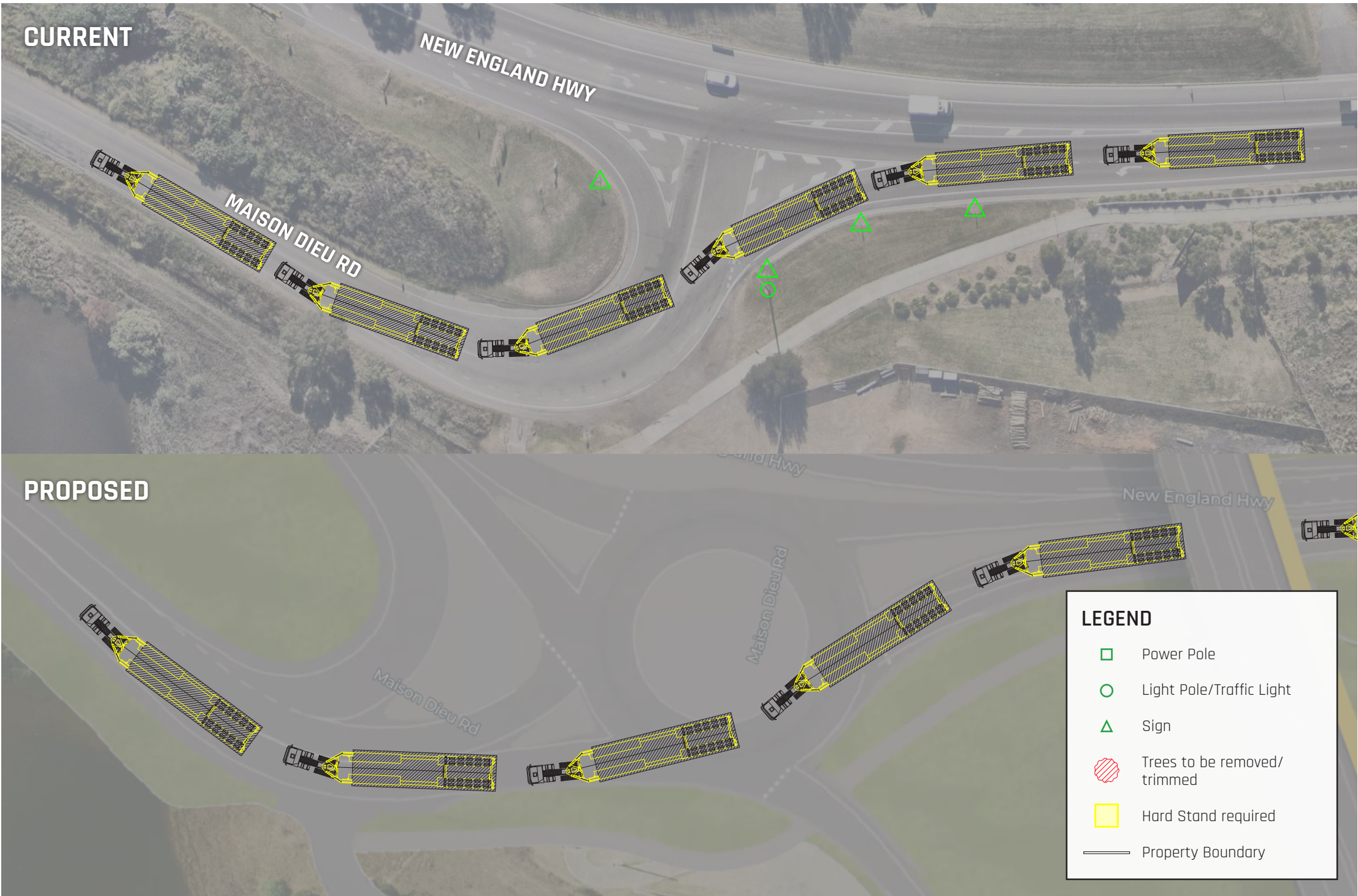
LEFT TURN
New England Hwy &
Maison Dieu Rd

- ROUTE 1
- ROUTE 2

The current intersection of Maison Dieu Rd and New England Hwy north of Singleton is a dogleg left-right turn off the highway. OSOM loads for the solar farm are able to take this corner as is - refer to swept path at top right.

The intersection is earmarked for a substantial upgrade as part of the proposed Singleton Bypass project. The project is only in the early stages of design, however ARES have assessed the current proposed design (as at January 2024), which includes the addition of a roundabout at this intersection. The largest load should be able to negotiate this new roundabout also. No above-ground traffic infrastructure such as light poles and signs were shown - these will need to be checked once the design is more mature.

We note that should transport occur during construction of the intersection, there may be restrictions on OSOM travel through the area. This may include detours, width or height restrictions, curfews, etc. We recommend close liaison with TfNSW to keep track of developments on the Singleton Bypass project along with any potential impacts to transport to Maison Dieu Solar Farm.



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DRAWN BY:

DRAWN DATE:

CHECKED BY:

CUSTOMER: Terrain Solar

PROJECT: Maison Dieu SF

DRAWING TITLE: SWEPT PATH DRAWING

DRAWING NAME: Route Survey

SIZE:

SCALE NTS

SHEET NO:

REV

ARES PROJECT SERVICES PTY LTD - ABN: 45 643 587 115

Pinch Point

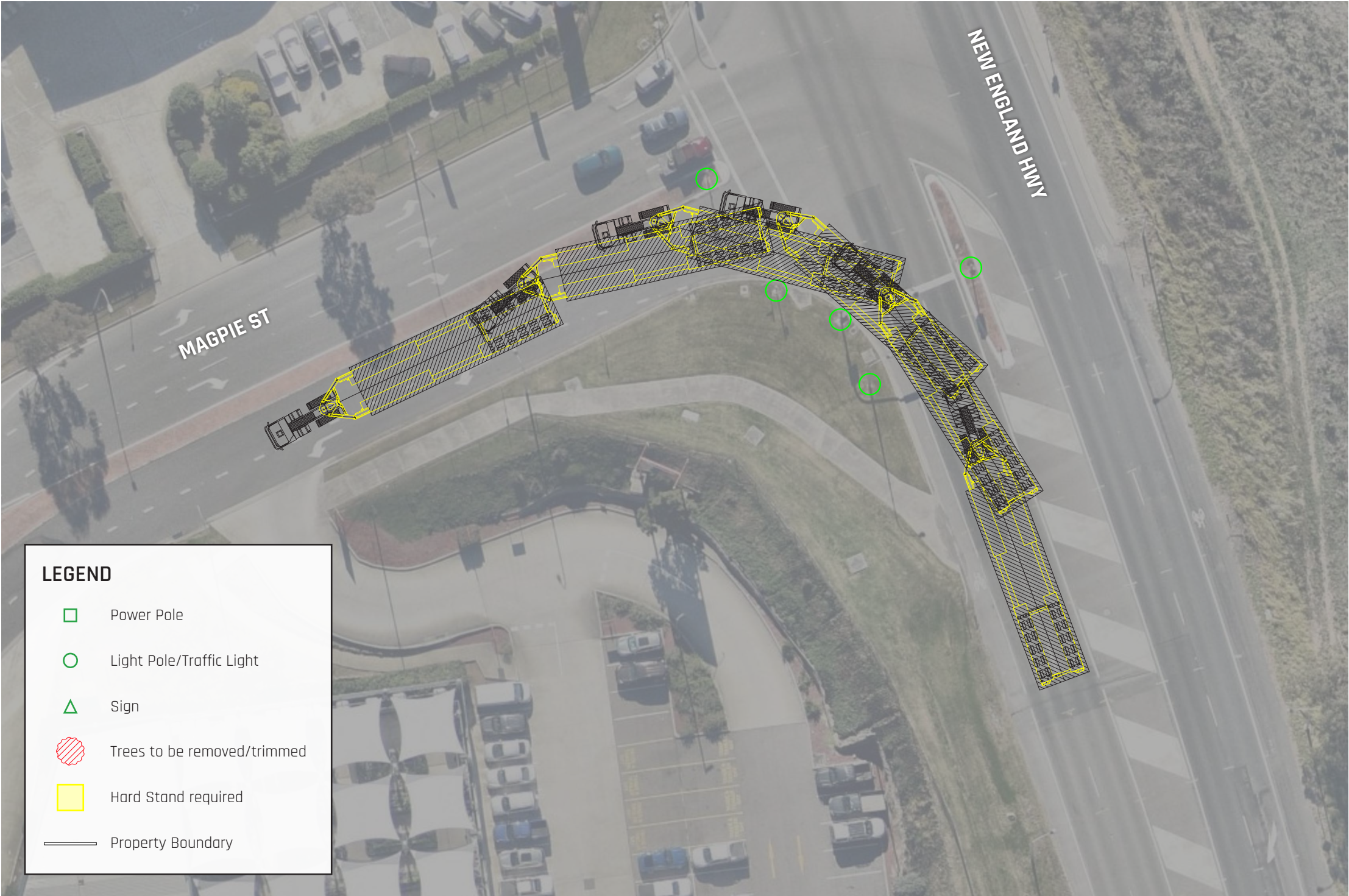
02

LEFT TURN
New England Hwy
& Magpie St

ALT

If loads are unable to turn onto Maison Dieu Rd direct from New England Hwy for whatever reason, an alternate route is available via Magpie St.

The ALT route starts with a left turn onto Magpie St at the Bunnings Warehouse. The switchroom should be able to make it around this corner with no issues or modifications required. The truck may need to use some of the centre median on Magpie St whilst making the turn.



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		DRAWN DATE:			
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Pinch Point

03

RIGHT TURN
Magpie St &
Maison Dieu Rd

ALT

The ALT route rejoins with the main route at the end of Magpie St. This turn is quite wide and free of obstacles and can be taken with no issues. The lead pilot will need to head further down Maison Dieu Rd to warn any oncoming traffic to slow down whilst the oversized load takes the turn.

LEGEND

- Power Pole
- Light Pole/Traffic Light
- Sign
- Trees to be removed/trimmed
- Hard Stand required
- Property Boundary



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CUSTOMER: Terrain Solar

PROJECT: Maison Dieu SF

DRAWING TITLE: SWEPT PATH DRAWING

DRAWING NAME: Route Survey

SIZE:

SCALE NTS

SHEET NO:

REV

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Pinch Point

04

RIGHT TURN
Maison Dieu Rd
& Site Entrance

- ROUTE 1
- ROUTE 2

The site entrance into the solar farm is approximately 400m east of the Ausgrid Singleton Substation entrance on Maison Dieu Rd.

A new intersection will be built by others for site access purposes. Design of this intersection has not commenced, however ARES have performed a swept path analysis to show the amount of area required for the largest loads (switchrooms) to turn into site.

The internal site access tracks leading to the substation will also need to be designed with the switchroom swept path in mind.



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02

Conclusion

Conclusion

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



...transport
of OSOM
components
to Maison Dieu
Solar Farm is
feasible.

Summary

Following our physical survey and analysis, ARES believe that transport of the oversize overmass (OSOM) components for the Maison Dieu Solar Farm project from the ports of **Port Botany** or **Newcastle** is feasible with no modifications required along either route.

Overall transport height was the primary consideration for this survey due to the presence of multiple bridges and overhead obstructions getting out of the metropolitan areas of both Sydney and Newcastle. The lowest bridge on Route 1 (Botany) is at **5.3m**, whilst for Route 2 it is **5.6m**.

The largest component (electrical switchroom) can be transported on an extendable low loader, which will keep loaded height to around **5.2m**. The load can be further lowered by ~150mm via the hydraulic suspension, which will provide additional clearance when passing under the lowest bridges.

There are no pinch points of concern along the route. However, there are some major road upgrade projects planned in the next few years which may affect deliveries for the solar farm. In particular, the Singleton Bypass project is likely to start construction in late 2024 and continue until 2026. The ramifications for OSOM deliveries to Maison Dieu Solar Farm are as yet unclear, but may include measures such as width restrictions,

detours, temporary road closures and so on. As these are major projects run by the state transport authority, Transport for New South Wales, we highly recommend maintaining good dialogue with TfNSW during the EIS approval process regarding the progress of these major upgrade projects.

An alternate route via Magpie St was also assessed and found to be suitable for OSOM transport. This may be used if the intersection of Maison Dieu Rd and New England Hwy is being upgraded as part of the bypass project.

Next Steps

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

- Confirm port of import (Port Botany or Newcastle) and transport route
- Apply for dummy permits to gather initial feedback on transport route and any permit conditions
- Initiate dialogue with TfNSW regarding timing of major upgrade projects and any impacts, especially the Singleton Bypass project





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