Traffic Impact Assessment

Oakdale West Industrial Precinct
SSD 7348 Modification 2

Ref: 0950r01
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1 Introduction

1.1 Executive Summary

Ason Group has been engaged by Goodman Property Services (Aust) Pty Ltd (Goodman) to prepare a Traffic Impact Assessment (TIA) to assess the access, traffic and parking implications of a proposed Modification (MOD 2) to SSD 7348 within Precinct 1 of the Oakdale West Industrial Estate (OWE).

The OWE Precinct is a warehouse and industrial development situated in Kemps Creek. The Precinct lies within a series of strategic growth corridors including the Western Sydney Growth Centre and Broader Western Sydney Employment Areas and is intended to be serviced by the Western North South Link Road. The modifications included in MOD 2 involve changes to Precinct 1 of the **2019 Approved Development**, impacting Gross Floor Area, outbuildings and tenancy. This TIA document addresses the impact of these changes.

Accordingly, the facility has been designed to meet all parking requirements as outlined in the Council's LEP and DCP. This involves the implementation of 558 parking spaces serving the 3 lots, with the inclusion of 11 accessible parking spaces ideally situated to building and office entry locations. To similar effect, the internal circulation, access crossovers and service vehicle access for Lot 1A as well as 1B and 1C have been assessed and are deemed to generally comply with Council DCP and Australian Standards. Accordingly, the site layout design of the Modification has been deemed satisfactorily.

The anticipated tenant of Lot 1A is expected to generate vehicular traffic in the order of:

- 70 vehicle trips in the AM and PM Peak periods, and
- 1,778 total daily trips.

To a smaller degree, Lots 1B and 1C are expected to provide for 24 vehicles in the peak periods, and 281 total daily trips.

The resulting total generation for Precinct 1 (94 trips in the AM and PM Peak Periods and 2,059 total daily trips) is lower than the number outlined in the **2019 Approved Development**, indicating reduction in anticipated vehicles to the overall network.

Network Peak	Lot 1A	Lots 1B & 1C	Total Precinct 1 Trips	2019 Approved Development
AM & PM Peaks	70 (79)	24	94 (103)	190
Daily	1,778 (2,222)	281	2,059 (2,503)	2,202

Note: Numbers in brackets denote the totals for Seasonal Peak operation.

In summary of the document, the imposed traffic impacts as a result of MOD 2 is deemed supportable due to an overall reduction in traffic volumes during the road network peak periods, as well as access, circulation and parking characteristics of the Site which have been assessed. Accordingly, this TIA is in support of the Modification and does not determine any additional infrastructure upgrades over what has been approved as part of the 2019 Approved Development.

1.2 Overview

MOD 2 provides for:

- Changes to the Precinct 1 building layouts, resulting in an overall increase in gross floor area (GFA) across Precinct 1 from the approved 116,359m^2 to 122,082m^2; including the following gross leasable areas (GLA):
  - 81,773 m^2 GLA of warehouse space,
  - 3,903 m^2 GLA of office space; and
  - 4,004 m^2 of outbuildings.
- An additional Warehouse 1A car park access driveway (left-in / left-out) to the Western North-South Link Road (WNSLR), and
- An increase in the height of Warehouse 1A from the approved 13.7m to between 27.35m and 36.79m.

Full details of MOD 2 are provided in the Environmental Impact Statement (EIS) which this TIA accompanies.

1.3 Study Purpose

From the outset, it is critical to state that – given the recent Department of Planning, Industry & Environment (DPIE) approval of SSD 7348 – MOD 2 has been assessed in this TIA against the 'benchmark' conditions as detailed in the SSD application, given that these conditions have inherently been considered and validated by the key consent authorities, including the DPIE and Roads and Maritime Services (RMS).

This TIA therefore provides an assessment of the access, traffic and parking characteristics of Precinct 1 further to MOD 2, which have then been compared to the approved characteristics of Precinct 1 to determine any significant departures from the current approval, particularly in regard to traffic generation.

In this regard, Ason Group has undertaken the following:

- Reviewed the existing SSD approval and specifically the traffic (and other) assessment which supported the (subsequently approved) SSD application;
- Assessed the traffic generation and distribution characteristics of Precinct 1 further to MOD 2,
- Assessed the potential MOD 2 impacts at the key intersections and through the internal and external road network; and
- Assessed the proposed access, parking and servicing provisions across Precinct 1.

It is noted that in determining the above scope of work, reference has again been made to the Secretary's Environmental Assessment Requirements (SEARs) (November 2015 and Revised SEARs 2017) which were prepared by the DPIE in regard to the original SSD 7348 application.

1.4 Reference Documents

In the preparation of this TIA, reference has been made to the following key transport standards and guidelines:

- RMS Guide to Traffic Generating Developments (RMS Guide).
- Austroads Guide to Road Design Part 3: Road Geometry (Austroads GRD3).
- Austroads Guide to Road Design Part: 4A Unsignalised and Signalised Intersections (Austroads GRD4A).
- Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis (Austroads GTM3).
- Australian Standard 2890.1: Parking Facilities – Off-Street Car Parking (AS 2890.1).
- Australian Standard 2890.2: Parking Facilities – Off Street Commercial Vehicle Facilities (AS 2890.2).
- Australian Standard 2890.6: Parking Facilities – Off Street Parking for People with Disabilities (AS 2890.6).

This TIA also references assessments relating to development within the OWE; the broader Oakdale Industrial Estate in which the OWE lies; and the Broader Western Sydney Employment Area, including:

  - *Traffic Impact Assessment Oakdale West Estate State Significant Development Application – Response to Submissions*, 27 November 2018 (OWE TIA RTS)
- *Traffic Impact Assessment Oakdale West Industrial Precinct State Significant Development Application* prepared by Ason Group, 24 March 2017 (OWE TIA 2017).

- *Erskine Park Traffic Modelling – Proposed Western North South Link Road, prepared by GHD,* May 2016 (WNSLR Report).
- *Broader WSEA SLRN – Options Refinement (2014),* prepared by AECOM, 6 May 2014 (SLRN Options Report).
- *Old Wallgrove Road Extension Interim Network Testing*, prepared by GHD, 28 March 2014 (OWR Extension Report).
- *Broader Western Sydney Employment Area – Transport Planning Preliminary Analysis, Exhibition Draft*, prepared by GHD, June 2013 (BWSEA Transport Report).
- *Old Wallgrove Road Upgrade (Roberts Road - M7 Motorway) Traffic and Transport Report*, prepared by GHD, 30 April 2012 (OWR Upgrade Report).
- *Western Sydney Employment Area – Southern Link Road Network Strategic Transport Assessment*, prepared by AECOM, 18 April 2011 (SLRN Report).

2 SSD 7348 SEARs

The SSD 7348 MOD 2 SEARs prepared by DPIE addresses the requirements with respect to the Modification associated with Traffic, Parking and Access elements of the development. Accordingly, this Traffic Impact Assessment report addresses the requirements as outlined below.

Table 1: SEARs Requirements

SSD 7348 MOD 2 SEARs - *Traffic, Parking and Access*	
Requirements	**Response**
(a) An updated Traffic Impact Assessment detailing any changes to daily and peak traffic and transport movements likely to be generated (vehicle, public transport, pedestrian and cycle trips) during construction and operation of the development, including a description of vehicle access routes (construction and operation) and the impacts on nearby intersections	This Traffic Impact Assessment has been prepared to address this requirement. Operational and construction trip generation is discussed in **Sections 6** and **7**, respectively. Further details associated with construction management are provided in a separate CTMP, included as part of the overall CEMP. In summary: • Operational traffic volumes are projected to be: o Less than peak hourly traffic volumes associated with previous consents and, as such, does not have an adverse impact on the planned road network. o Daily traffic is also generally lower than MOD 1. Daily traffic is slightly higher overall during peak seasons; however this occurs over a short period and does not impact road network capacity and therefore does not require additional improvements. • Construction traffic volumes and impacts thereof — whilst increased from the original concept plan — are similar to that associated with MOD 1. As such, the construction impacts of MOD 2 have already been addressed. • Non-car travel modes (public transport, pedestrian and cycle trips) represent a low proportion of overall trips expected to be generated for the Estate, having regard for existing availability of services and connections. Accordingly, minor changes resultant of MOD 2 will not impact this trip generation.
(b) Updated site access details including access to the site from the road network, intersection location, design and sight distance	Updated details associated with access crossover locations and sight distances have been appropriately addressed as part of the Design Commentary in **Section 8**. The architectural plans for MOD 2 have been assessed with reference to relevant Australian Standards AS2890.1, AS2890.2 and AS2890.6.

SSD 7348 MOD 2 SEARs - *Traffic, Parking and Access*	
Requirements	**Response**
(c) An updated assessment of predicted impacts on road safety and the capacity of the road network to accommodate the modification	An updated assessment of traffic generation, and by associated impacts to the road network is addressed in **Section 6.**
(d) Updated plans of the proposed site access and parking provision on site in accordance with the relevant Australian Standards and with reference to the existing approval	Details of the changes associated with MOD 2 are provided in **Section 5**. Car parking provisions comply with the approved rates and the car park, site access and loading areas have generally been designed in accordance with Australian Standards.
(e) Updated details of impact mitigation, management and monitoring measures	The traffic generation of MOD 2 has demonstrated an overall reduction in peak hourly traffic volumes from the previously conducted precinct-wide modelling for the estate. As such, no additional mitigation or monitoring measures beyond that required for the previous approval are required.

3 The Oakdale West Estate

3.1 Location

The OWE is located within the Penrith City Council (Council) Local Government Area (LGA) and forms part of the broader Oakdale Industrial Estate (the Oakdale Estate), some 421 hectares of industrial zoned land within the Western Sydney Employment Area (WSEA). The OWE itself provides some 154 hectares of industrial zoned land, with a developable area of approximately 89 hectares.

The OWE is bordered by the Sydney Water Pipeline to the north; the Oakdale East Estate (OEE) and Oakdale South Estate (OSE) to the east and south-east respectively; and rural land to the south and west (Kemps Creek), though it is noted that these areas are expected to be rezoned for future industrial use further to the finalisation of a Structure Plan for the Broader Western Sydney Employment Area (BWSEA).

The OWE is shown in its local context in **Figure 1**; while the Oakdale Estate is shown in its sub-regional context (within the BWSEA) in **Figure 2** and regional context in **Figure 3**.

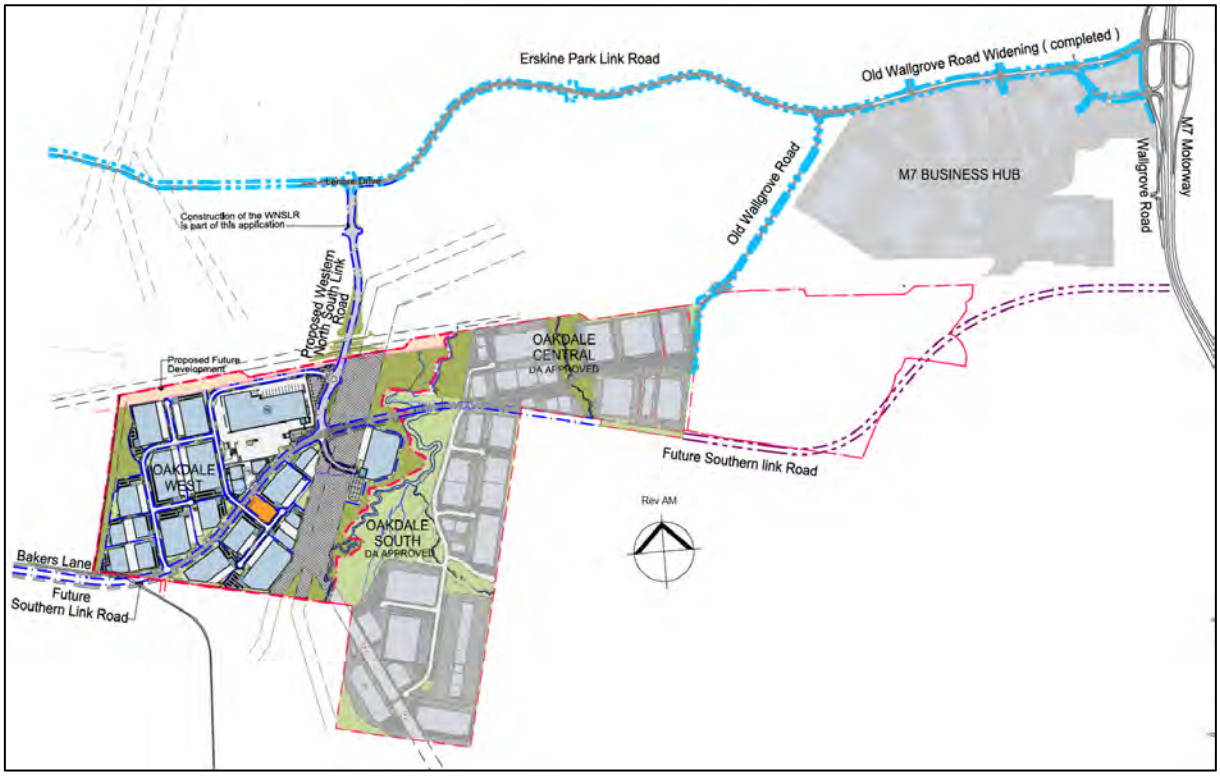


Figure 1: Oakdale West Estate Local Context

Source: SBA Architects

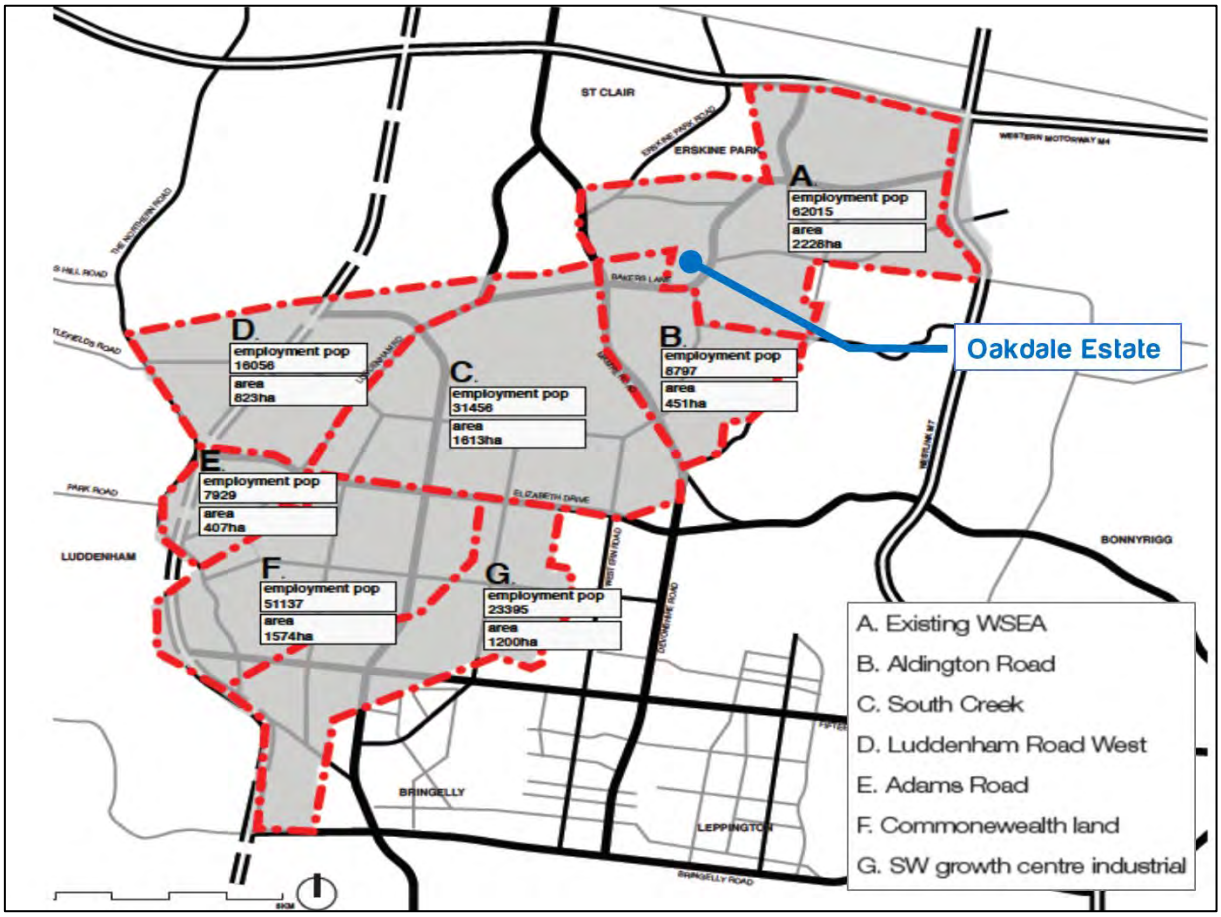


Figure 2: BWSEA Precinct Plan

Source: GHD

Figure 3: Oakdale Estate Regional Context

3.2 Strategic Context

3.2.1 Western Sydney Growth Centres

The Oakdale Estate will provide employment generating land-uses, as envisaged for the WSEA, within close proximity of strategic development across Western Sydney, including the South West Growth Centre (SWGC); the North West Growth Centre (NWGC); and the Western Sydney Aerotropolis (WSA).

To provide for the transport demands of this level of development, a number of key infrastructure projects are proposed or in progress within the Western Sydney Infrastructure Plan (WSIP), as shown in **Figure 4**. It is noted that these infrastructure projects (appropriately) underpinned the traffic assessments supporting the Oakdale Estate and OWE traffic assessments.

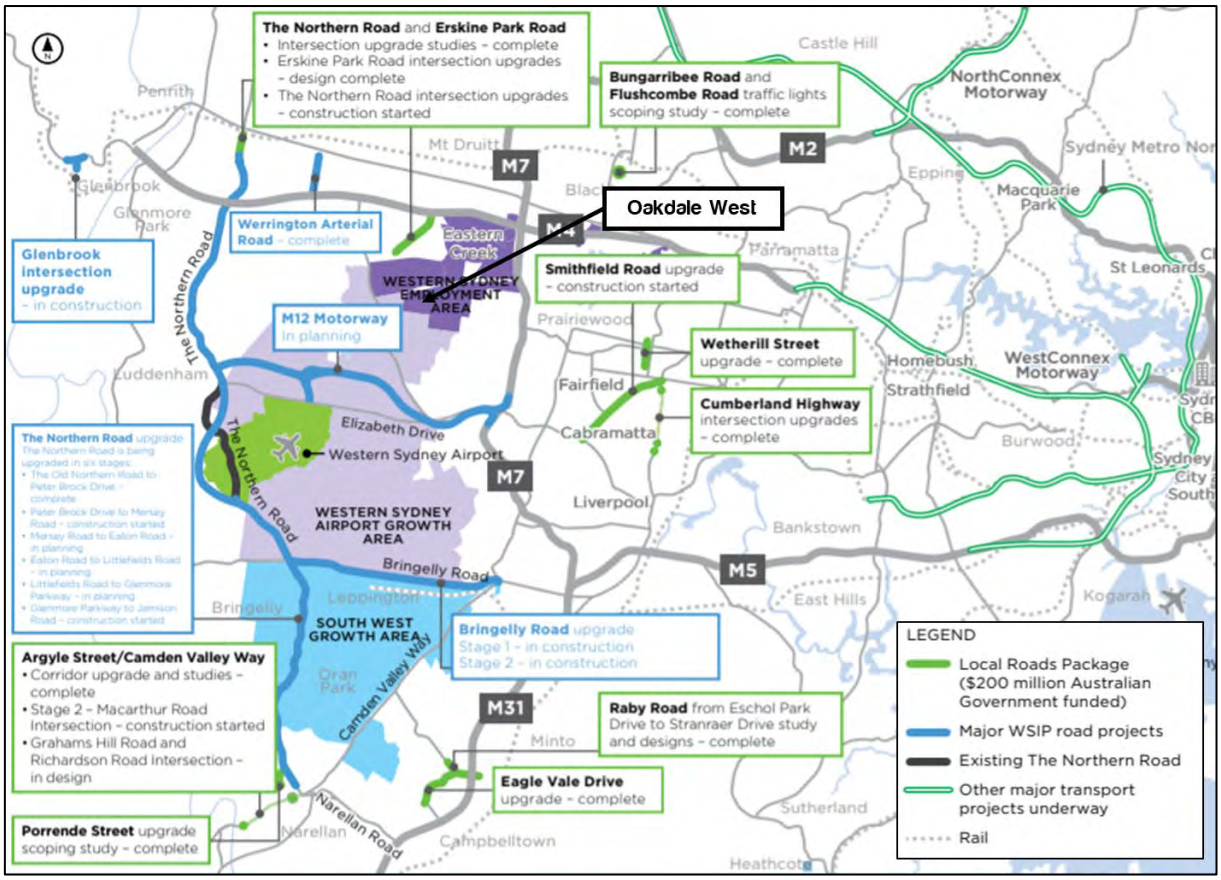


Figure 4: Western Sydney Infrastructure Plan Overview Map

Source: RMS

3.2.2 Broader Western Sydney Employment Area

The development of the OWE is also entirely consistent with the BWSEA Draft Structure Plan, which aims to develop an emerging employment, trade, industrial, freight and logistics complex extending across metropolitan Sydney.

In this regard, extensive transport planning has been undertaken by RMS and the DPIE to ensure that suitable road network capacity is provided for planned development of the Oakdale Estate, with key projects including the Old Wallgrove Road (OWR) upgrade; the extension of OWR; and the proposed Southern Link Road (SLR). Again, these infrastructure projects underpinned the traffic assessments supporting the Oakdale Estate and OWE traffic assessments and are discussed further below.

3.2.3 Western North-South Link Road

Part of the strategic road network for the WSEA is the Western North-South Link Road (WNSLR), connecting Lenore Drive in the north to the proposed Southern Link Road, and forming an intersection with Lockwood Road. The WNSLR will provide a 4-lane divided carriageway and provide access to the OWE via a roundabout at the north-east of the Estate.

3.3 Access Road Network

The constructed / approved road network which will provide access for the OWE is shown in **Figure 5** and detailed further in sections below.

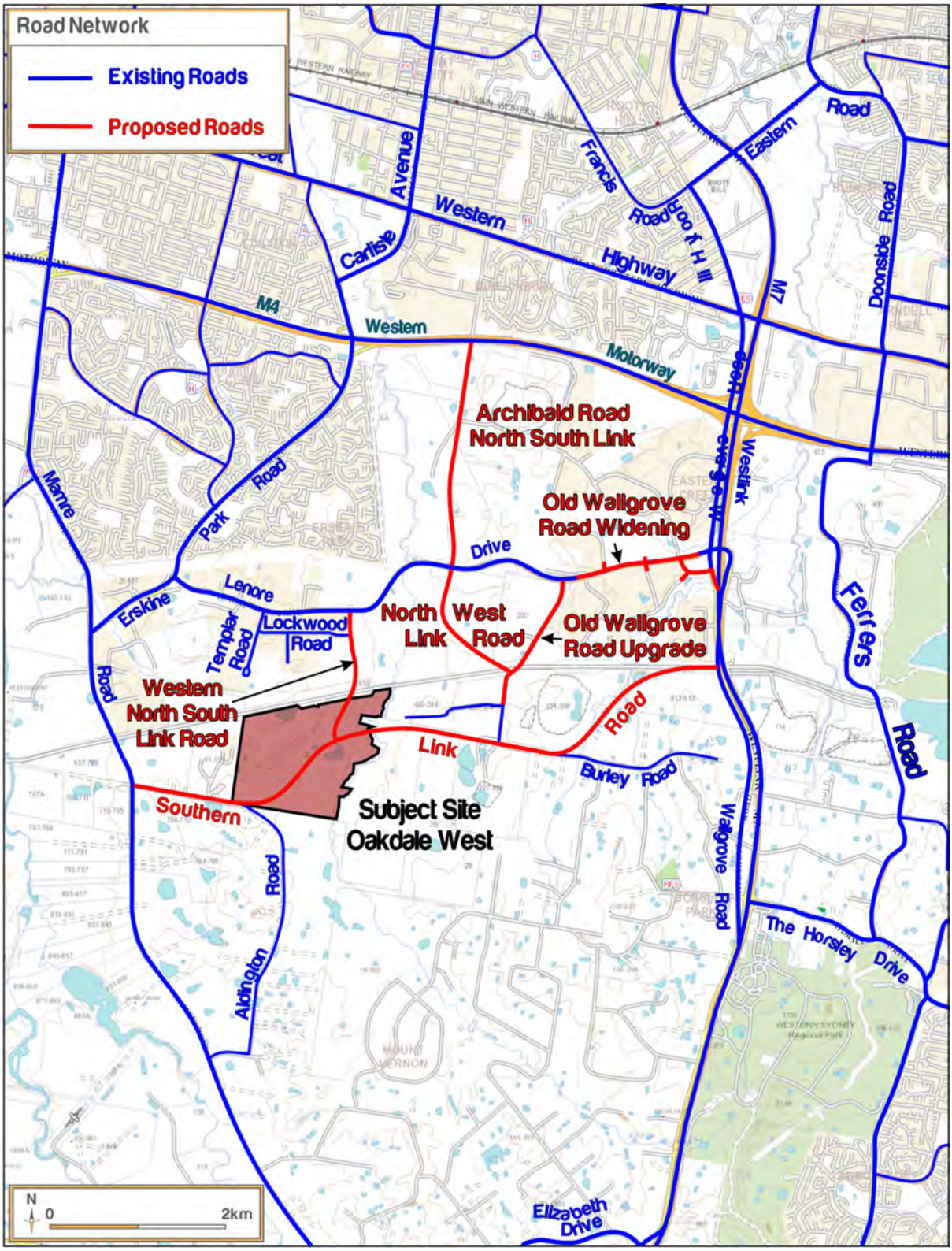


Figure 5: Future Road Network

3.3.1 Key Roads

The key roads providing access for the OWE include:

- **M7 Motorway:** The M7 Motorway (the M7) is a high capacity road link of state significance built to accommodate future traffic growth in the Western Sydney region. It provides a key north-south link, to the east of the OWE between the M2 Motorway (the M2) to the north and the M5 Motorway (the M5) to the south as part of the Sydney orbital road network. A major interchange between the M7 and M4 Western Motorway (the M4) is located approximately 2.5 km north of the OWE, which connects the Sydney CBD and western Sydney.

The M7 provides a 4-lane divided carriageway (2 lanes per direction) and has a posted speed limit of 100 km/h speed limit.

- **Wallgrove Road:** Wallgrove Road is an arterial road that runs in a north-south direction to the east of the OWE (parallel to the M7) and provides a link between Great Western Highway to the north and Elizabeth Drive to the south. As with the M7, Wallgrove Road connects to the M4 approximately 2.5 kilometres to the north of OWE.

Wallgrove Road provides 2 lanes for two-way traffic and in the vicinity of the OWE has a posted speed limit of 70 km/h.

- **Old Wallgrove Road:** Old Wallgrove Road (OWR) generally runs north-south in the vicinity of the OWE before turning to provide an east-west connection between Wallgrove Road and the M7 to the east and Lenore Drive (and through to Mamre Road) to the west. Significant upgrades of OWR have recently been completed by the RMS; it provides a 4 – 6 lane divided carriageway (with 2 – 3 lanes per direction) and has a speed limit of 80km/h in the vicinity of the Oakdale Estate.
- **Lenore Drive**: Lenore Drive is a recently upgraded sub-arterial road providing an east-west connection between OWR to the east and Mamre Road to the west. Lenore Drive provides a 4-lane divided carriageway (2 lanes per direction) and has a posted speed limit of 80km/h.
- **Western North South Link Road**: The WNSLR will link between Lenore Drive to the north and the SLR to the south and will provide access to the OWE via a new roundabout intersection (see Section 3.3.2 below). The WNSLR will provide a 4-lane divided carriageway (2 lanes per direction) and is expected to have a speed limit of 60km/h or 70km/h.
- **Southern Link Road Network**: The SLR network will provide the additional road infrastructure to accommodate travel demand generated by employment areas south of the Sydney Water Pipeline (including the OWE and broader Oakdale Estate). The indicative route for the SLR and future connections was initially identified in SEPP (WSEA) 2009 and has since been refined to the current alignment (as shown in Figure 6) which comprises of:

- An east-west SLR generally running parallel to Lenore Drive between Wallgrove Road to the east and Mamre Road to the west. Traffic generated by the BWSEA would use Mamre Road to connect to the wider road network to and from the north and south;
- A connection with OWR and an Eastern North-South Link Road (ENSLR) to join an extension of Archbold Road; the Archbold Road extension would then extend north from Lenore Drive to a new M4 interchange. The extension is currently being progressed by RMS and is expected to be delivered in 5 - 10 years, providing improved accessibility for the BWSEA with direct access to the M4 without the need to use either Wallgrove Road or the M7; and
- The WNSLR between Lenore Drive to the north and the SLR to the south. Until such time that the SLR is completed, the WNSLR will provide all access between the OWE and the sub-regional road network.

It is noted that the SLR network planning and development process is ongoing and is therefore potentially subject to change due to further refinement of the route alignment and access arrangements. Importantly, the development of the OWE is not dependent on the SLR itself.

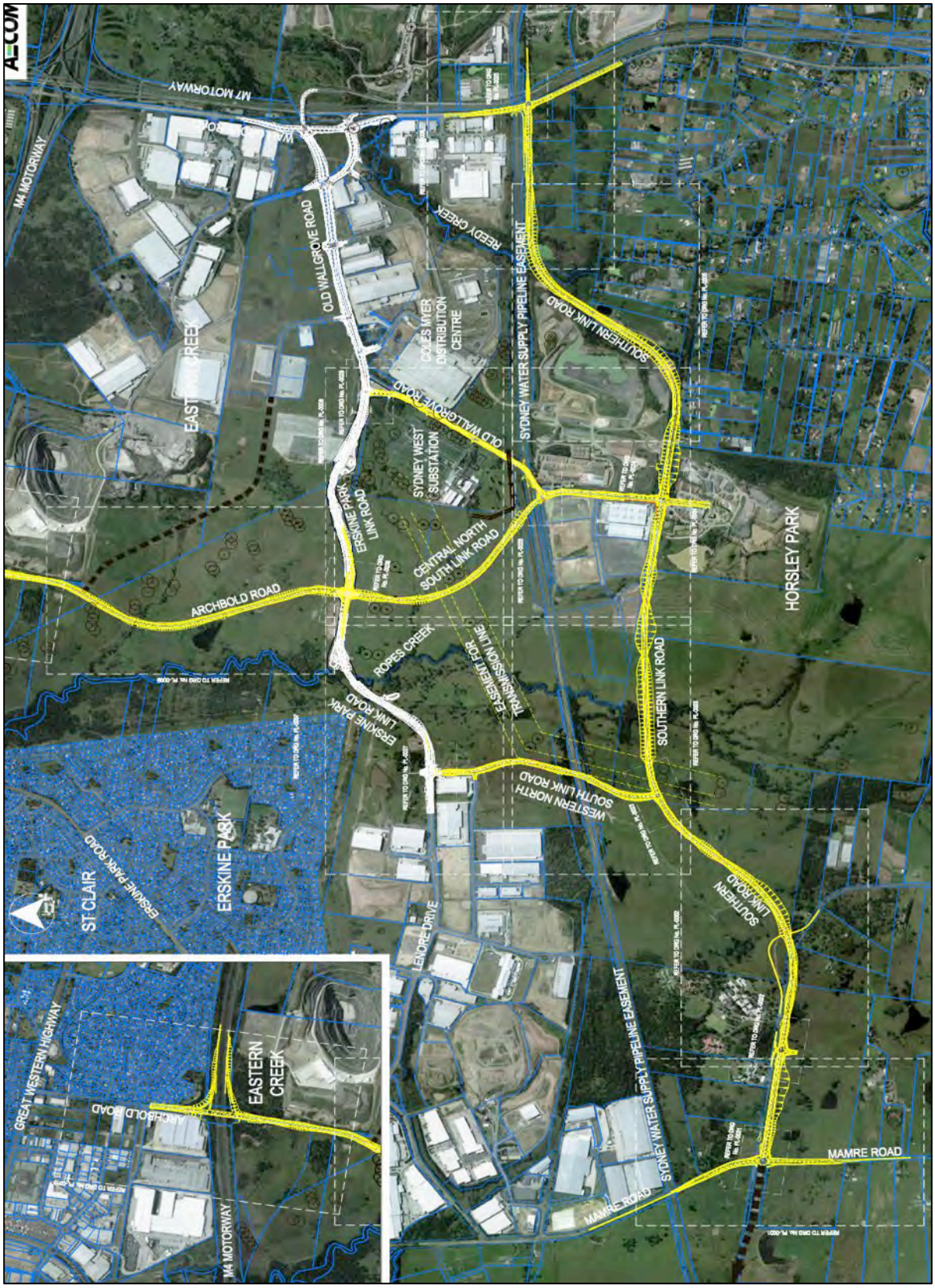


Figure 6: Proposed Southern Link Road Network and Alignment

Source: AECOM

3.3.2 Key Intersections

The key intersections providing access for the OWE include:

- **Lenore Drive & WNSLR & Grady Crescent:** A signalised intersection with Lenore Drive, providing access to the regional road network and a local connection to an extended Grady Crescent to accommodate future industrial development to the north.
- **WNSLR & Lockwood Road:** A roundabout intersection providing a local connection between WNSLR and Templar Road, as well as providing a connection for a local road supporting development to the east, comprising the balance of Fitzpatrick lands.
- **WNSLR & Estate Road 1:** A roundabout intersection providing primary access to the OWE prior to the completion of the SLR.
- **WNSLR & SLR:** A signalised intersection completing the north-south connection between Lenore Drive and SLR. This intersection will also provide access to Precinct 5 of the OWE via Estate Road 8 to the south of the intersection.

Further details in regard to the upgraded / proposed intersections specifically related to the SSD approval are provided in **Section 3.3.3**.

3.3.3 Intersection Design

The design of the key intersections listed above have been developed to ensure appropriate intersection operations through a forecast year 2036. The design of each is shown in **Figure 7** below, while more detail in regard to the future operation of these intersections is provided in **Section 4.5**.

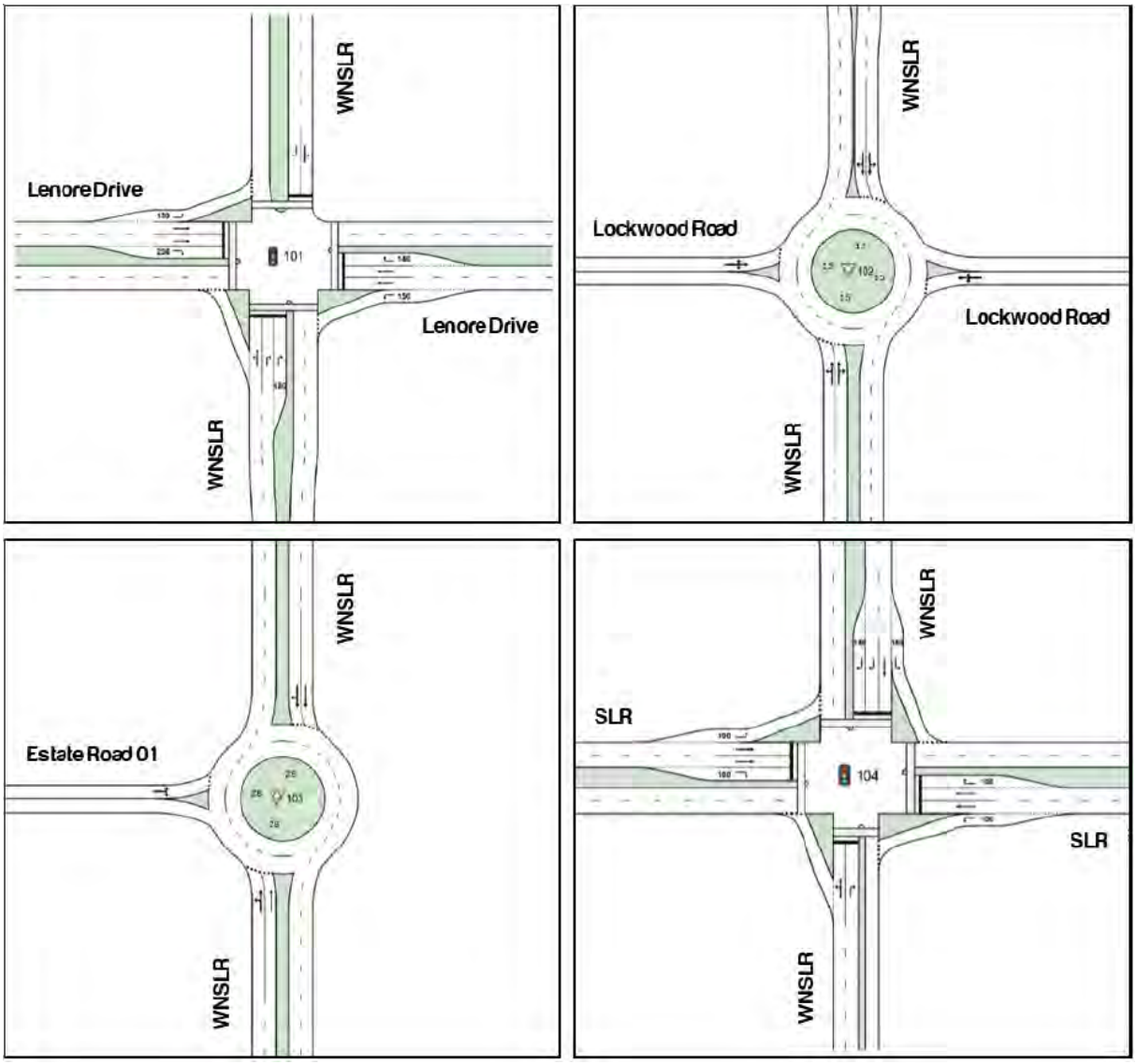


Figure 7: Approved WNSLR Intersections

Noting that the modelling provided in earlier assessments indicated the potential for the intersection of Lenore Drive & WNSLR to operate at a poor Level of Service (LoS) by 2036 (primarily as a result of background traffic increases), a further upgrade was investigated in the OWE TIA RTS, as shown in **Figure 8** below.

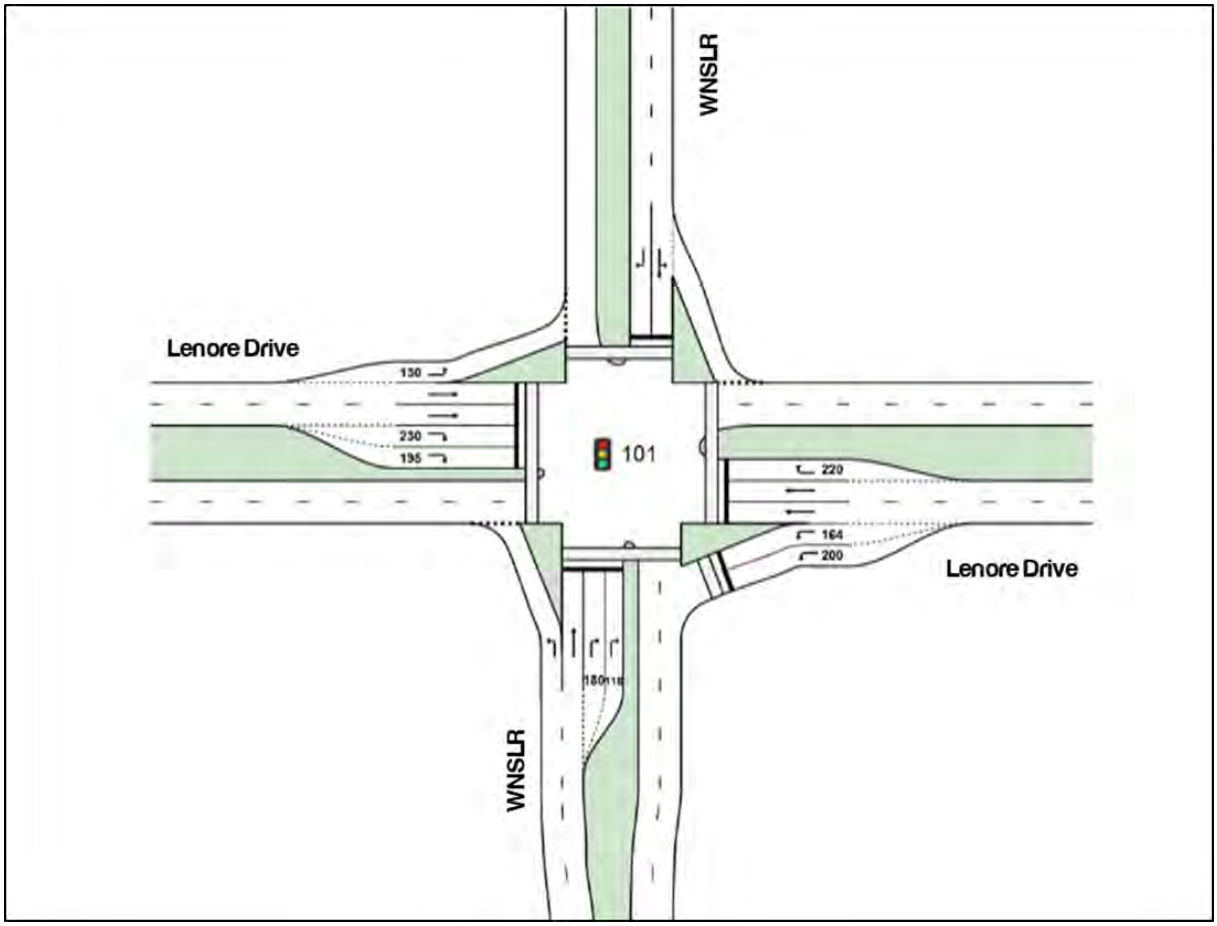


Figure 8: Lenore Drive & WNSLR Intersection – Approved Additional Upgrades

3.4 Public Transport Services

3.4.1 Existing Bus Services

While existing bus services within the vicinity of the OWE are shown in **Figure 9** below, it is evident that OWE is not directly serviced by public transport services at this time. Notwithstanding, the opportunities for future connections have been identified and are discussed further below.

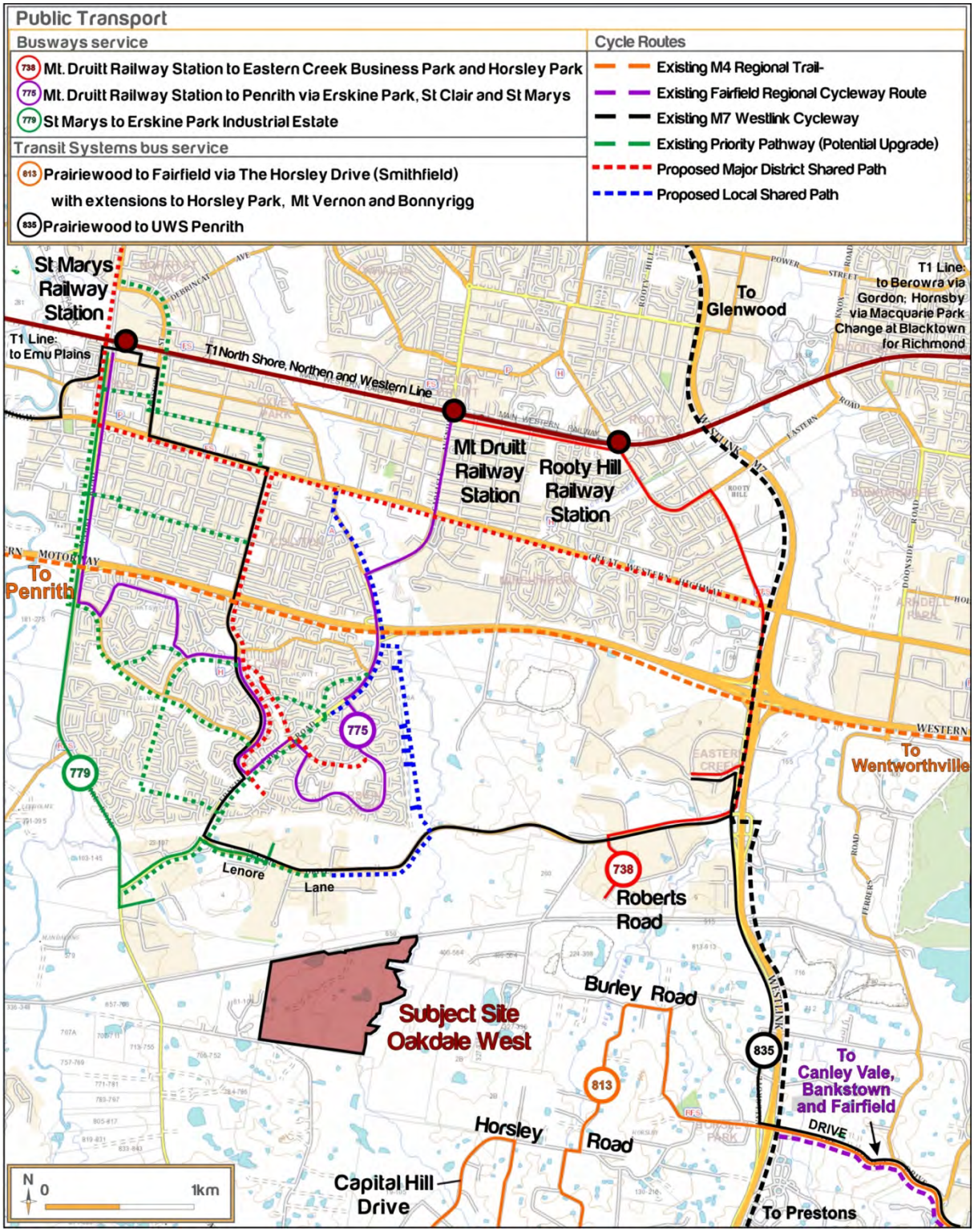


Figure 9: Existing Public Transport and Cycle Links

3.4.2 Bus Service Opportunities

There is substantial opportunity to provide improvements to public transport connectivity within the WSEA (likely via Lenore Drive) and additional provisions for 'localised' services as employment numbers increase and additional road infrastructure becomes available.

The planning of bus services in Sydney is governed by the NSW Service Planning Guidelines, which aim to establish Strategic Transport Corridors and a hierarchy of bus route types that:

- Link to regional centres (such as Penrith and Mt Druitt);
- Pass through patronage generators such as district centres, TAFE colleges, hospitals and universities;
- Connect with other transport modes (trains, ferries and other buses);
- Are multifunctional (serving journeys to work, education, shopping and recreation);
- Are direct and frequent; and
- Meet the network planning principles.

The establishment of public transport services as early as possible in the development stages of the area is important to ensure that a culture of public transport use is achieved from the outset. To make public transport a viable choice in the study area, the services should ideally:

- Integrate with existing bus services in the area;
- Connect to regional centres of Penrith, Mt Druitt and Blacktown; and
- in the longer term, connect to areas such as Leppington in the South West Growth Centre, Prairiewood and the Liverpool to Parramatta T-Way.

The recent completion of Lenore Drive provides the opportunity to extend existing routes further into the WSEA. In addition to the 835 Bus Route, the Busways 738 and 779 services, which currently only extend partially into OWR from the east and Lenore Drive from the west respectively, could be extended to provide additional services to OWE and the broader Oakdale Industrial Estate.

3.5 Active Transport

Lenore Drive has been designed to provide appropriate cycle infrastructure, linking to the east (to the M7 cycleway) and the west (from the existing Mamre Road cycle path) with the potential for future augmentation via existing and proposed sub-regional links.

The upgrade of OWR, WNSLR and the construction of the estate roads will include a 2.5-metre shared path for both pedestrians and cyclists. This would provide an essential link to encourage the uptake of alternative transport modes such as cycling as opposed to the historic dominance of private vehicle travel.

Finally, the provision of appropriate cycle facilities, such as bicycle storage, lockers and shower facilities will further encourage the use of the existing networks, again assisting in the reduction of private vehicle travel for the journey to work.

4 SSD 7348 Approval

The section below provides a summary of the development of the OWE provided for by the DPIE approval (SSD 7348), noting again that these approved characteristics provide the benchmark by which to measure the potential impacts (transport and other) of MOD 2.

4.1 General Approval Conditions

A summary of the SSD approval - with specific consideration of conditions relating to traffic and transport - is provided in **Table 2**, while **Figure 10** and **Figure 11** show the approved OWE Master Plan and the (approved) Precinct 1 Concept Plan respectively.

Table 2: SSDA 7348 Approval

SSD 7348 Approval	Oakdale West Estate	OWE Precinct 1
Land Use		
Warehouse m^2 GFA	452,493	109,914
Office m^2 GFA	22,776	6,445
Total m^2 GFA	**475,269**	**116,359**
Car Parking		
Warehousing	1 / 300m^2	1 / 300m^2
Office	1 / 40m^2	1 / 40m^2
Accessible Parking	1 / 100 spaces	1 / 100 spaces

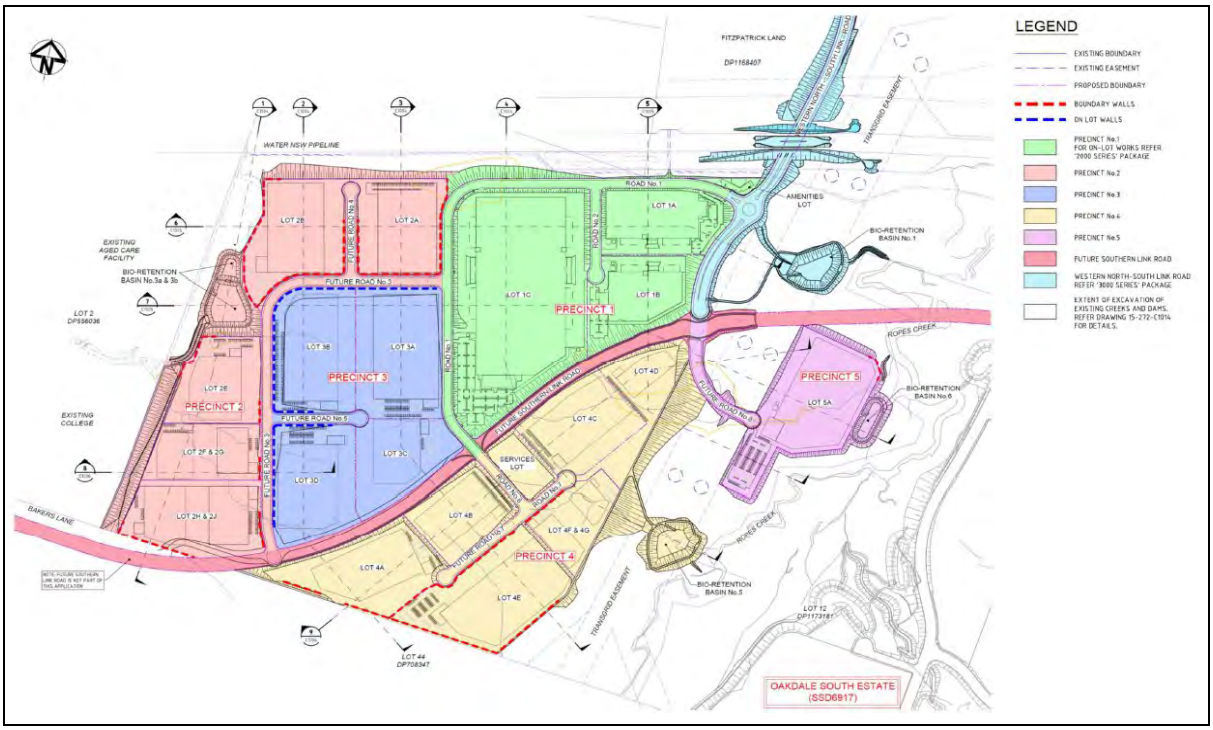


Figure 10: Approved Master Plan

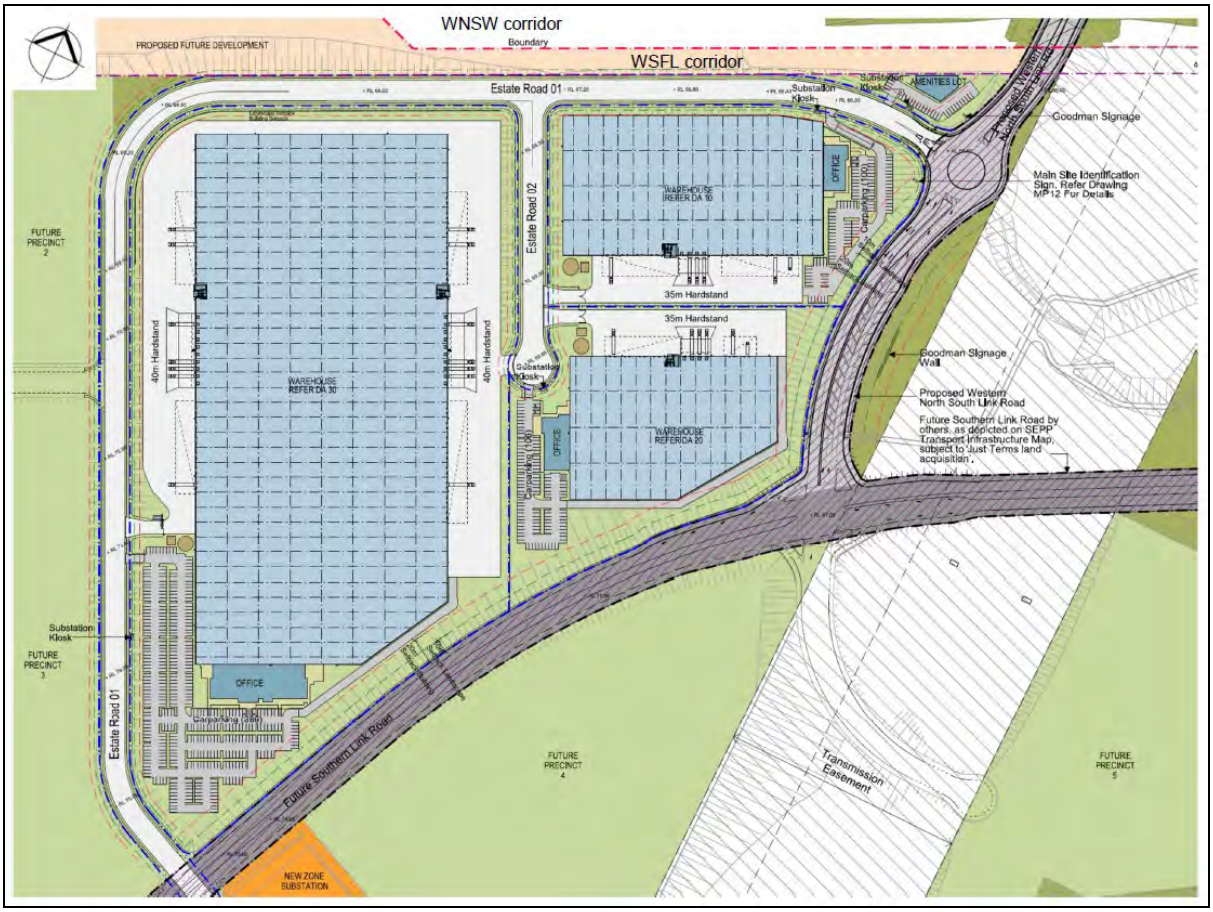


Figure 11: Approved Stage 1 Concept Plan

4.2 Road Infrastructure Conditions

4.2.1 West North South Link Road

Condition 48 of the SSD Approval states:

The Applicant must design and construct the WNSLR in accordance with the requirements of:

(a) the Relevant Roads Authority and an approval issued under section 138 of the Roads Act 1993;

(b) TfNSW for the bridge crossing of the future WSFL; and

(c) WNSW for the bridge crossing of the water pipelines corridor.

The WNSLR is to be constructed in accordance with the requirements of the current approval; these works would not be impacted by the MOD 2 subject for this TIA, other than the access driveway to Warehouse 1A.

4.2.2 WNSLR Intersections

Condition 49 of the SSD Approval states:

"The Applicant must design and construct the intersections of the WNSLR with Estate Road 1 and Lockwood Road to the satisfaction of the Relevant Roads Authority."

These intersections (roundabouts) are to be constructed in accordance with the requirements of the RMS and in accordance with the SSD Approval; these works would not be impacted by MOD 2.

4.2.3 Internal Roads

Condition 62 of the SSD Approval states:

"The Applicant must design and construct the internal estate roads and intersections to accommodate the turning path of a B-Double, to the satisfaction of the Relevant Roads Authority."

The design of the internal Estate roads – other than deletion of Road 02 which is now redundant – is not materially affected by MOD 2, with all internal roads to provide for the movement of B-Doubles throughout the OWE.

4.2.4 Internal Design

Condition 64 of the SSD Approval states:

The Applicant must ensure:

(a) internal roads, driveways and parking (including grades, turn paths, sight distance requirements, aisle widths, aisle lengths and parking bay dimensions) are constructed and maintained in accordance with the latest version of AS 2890.1:2004 Parking facilities Off-street car parking (Standards Australia, 2004) and AS 2890.2:2002 Parking facilities Off-street commercial vehicle facilities (Standards Australia, 2002);

(b) parking for Stage 1 is provided in accordance with the rates in Condition B13;

(c) the swept path of the longest vehicle entering and exiting the site, as well as manoeuvrability through the site, is in accordance with the relevant AUSTROADS guidelines;

(d) Stage 1 does not result in any vehicles queuing on the public road network;

(e) heavy vehicles associated with Stage 1 are not parked on local roads or footpaths in the vicinity of the Site;

(f) all vehicles are wholly contained on site before being required to stop;

(g) all loading and unloading of materials is carried out on Site;

(h) all trucks entering or leaving the Site with loads have their loads covered and do not track dirt onto the public road network; and

(i) the proposed turning areas in the car parks are kept clear of any obstacles, including parked cars, at all times.

MOD 2 will continue to provide compliance in regard to each of these design and operational management conditions detailed in the SSD Approval.

4.3 Approved Precinct 1 Traffic Generation

As discussed previously, the SSD Approval has inherently approved the forecast traffic generation of the OWE (and Precinct 1).

With reference to the OWE TIA 2017, the approved trips rates for the OWE were based on numerous studies for the WSEA and for major infrastructure projects in the sub-region. In this regard, development within the Oakdale Estate (previously referred to a 'Lands south of the Sydney Water Pipeline') was assessed using a trip rate of 21 vehicle trips per [developable] hectare across a two hour peak period, or 10.5 trips per [developable] hectare in a peak hour.

Applied to the OWE, this trip rate provided a peak hour traffic generation estimate of some 934 vehicle trips per hour (vph); a proportional application of this total trip generation to Precinct 1 provides a peak hour traffic generation estimate of some 230 vph.

The OWE TIA RTS also referenced the RMS Guide Update surveyed trips rates for the nearby Erskine Park Industrial Precinct (to provide a comparison with the trip rates adopted in the WNSLR Modelling Report) which are as follows; these RMS rates are as follows:

- 1.892 vehicles trips per day (vpd) per 100m^2 of industrial GFA (including ancillary office floor space); and
- 0.163 vph per 100m^2 GFA in the network peak hour.

Applied to the OWE, these trip rates provide peak hour and daily traffic generation estimates of some 775 vph and 8,992 vpd respectively, while (proportionally) applied to Precinct 1 they provide peak hour and daily traffic generation estimates of some 190 vph and 2,202 vpd respectively.

4.4 Future Traffic Volumes

4.4.1 Future Year Traffic

Based on the same traffic distribution and traffic generation assumptions adopted in the modelling undertaken for the BWSEA Structure Plan, the WNSLR Modelling Report forecast peak hour traffic volumes at the key intersection for the future years 2026 and 2036; these volumes are summarised in **Figure 12.**

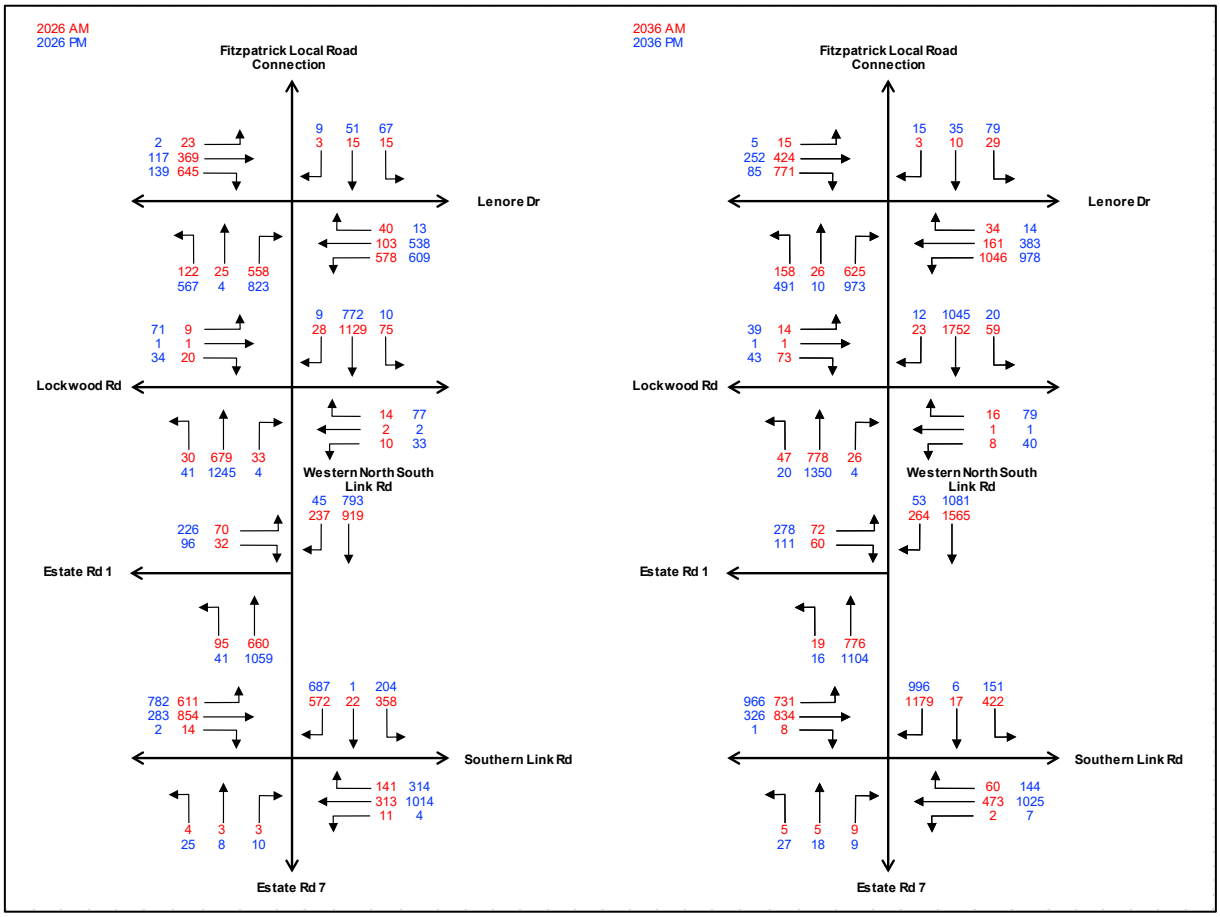


Figure 12: Forecasted 2026 (left) and 2036 (right) WNSLR Traffic Volumes

Source: Volumes extracted from GHD WNSLR report (June 2016)

4.4.2 Interim Traffic Volumes

Prior to delivery of the SLR, all access to OWE will be via WNSLR to Lenore Drive. The forecast traffic volumes within the internal OWE road network under this interim scenario are summarised in **Figure 13** and **Figure 14**. It is noted that these traffic volumes are based on the RMS Guide Update rates discussed above and represent an interim scenario which considers the full development of the OWE with all access from the WNSLR (i.e. prior to the completion of the SLR).

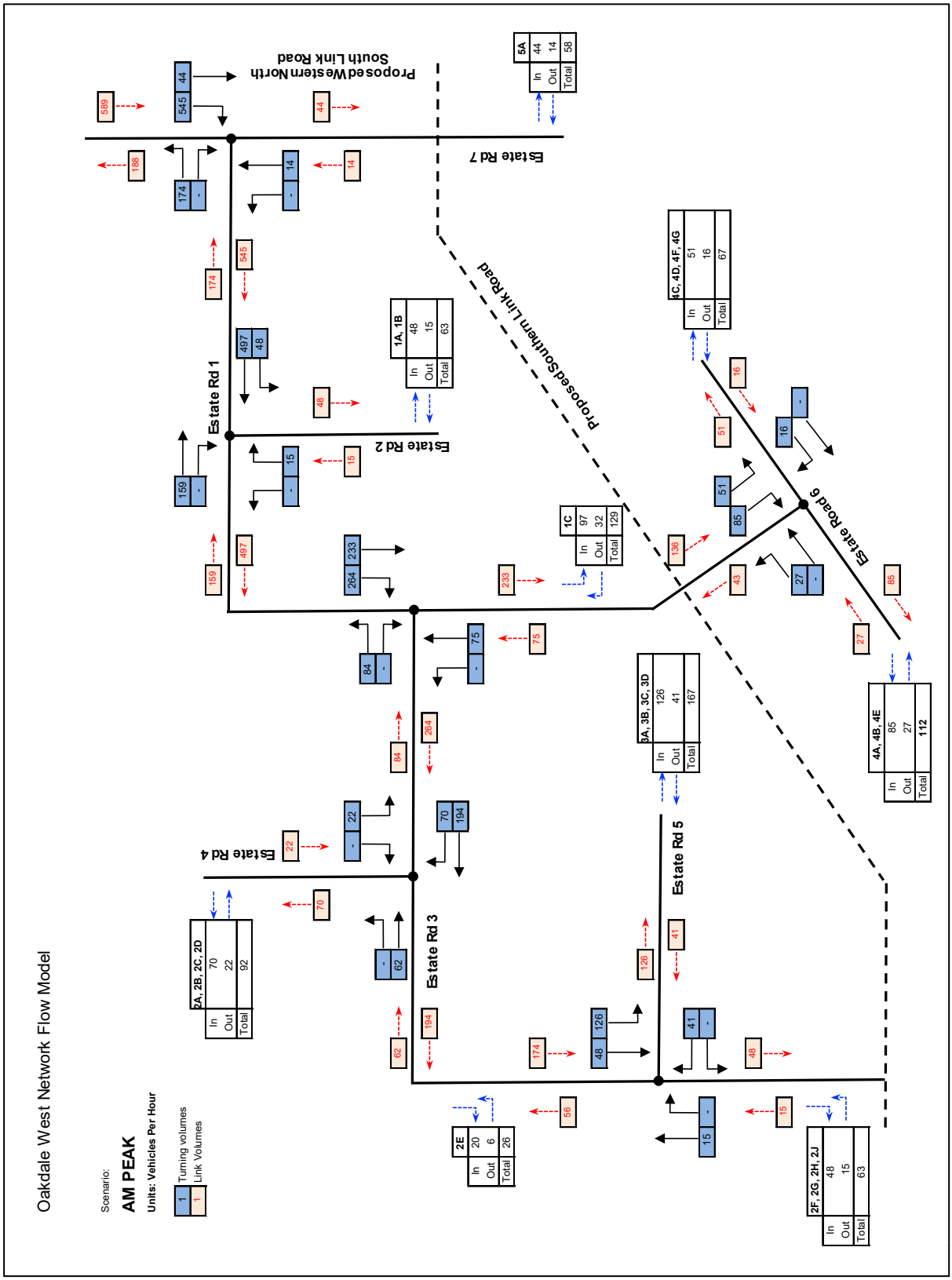


Figure 13: Interim AM Peak Traffic Volumes (Full Development of OWE, No SLR)

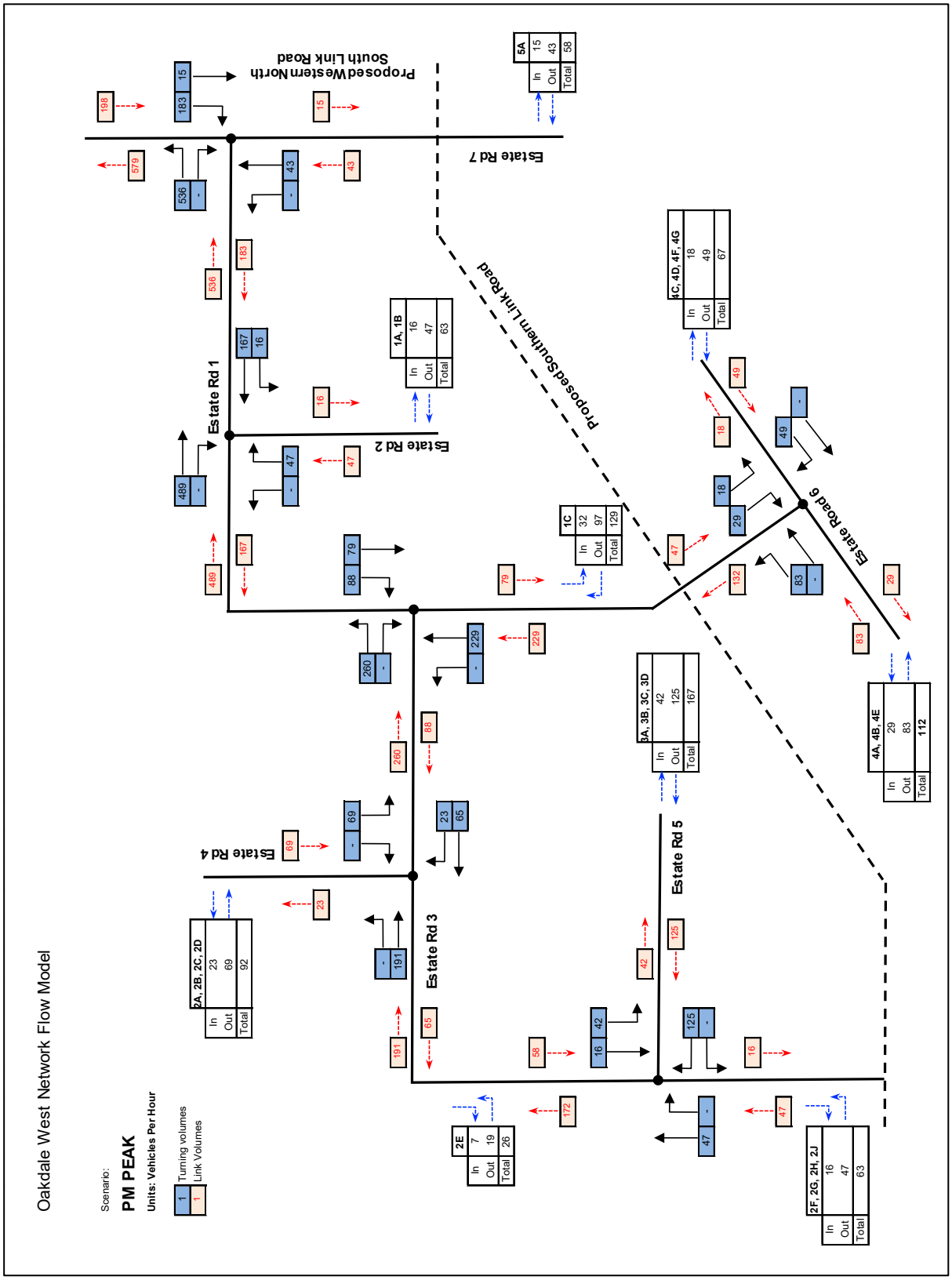


Figure 14: Interim PM Peak Traffic Volumes (Full Development of OWE, No SLR)

4.5 Future Intersection Operations

The SIDRA results reported in the OWE TIA RTS for the forecast years 2026 and 2036 are shown in **Table 3** and **Table 4** respectively, noting that the 2036 results for the intersection of Lenore Drive & WNSLR reference the [additionally] upgraded intersection as shown in **Figure 8**.

Table 3: 2026 Intersection Performance

2026 Intersection Operations	Peak Period	Average Delay (s)	Level of Service
WNSLR & Lenore Drive	AM	40.3	C
	PM	31.7	C
WNSLR & Lockwood Road	AM	13.1	A
	PM	14.8	B
WNSLR & Estate Road 1	AM	12.0	A
	PM	15.1	B
WNSLR & Southern Link Road	AM	30.3	C
	PM	35.9	C

Table 4: 2036 Intersection Performance

2036 Intersection Operations	Peak Period	Average Delay (s)	Level of Service
WNSLR & Lenore Drive	AM	37.9	C
	PM	26.9	B
WNSLR & Lockwood Road	AM	17.9	B
	PM	15.1	B
WNSLR & Estate Road 1	AM	12.5	A
	PM	17.7	B
WNSLR & Southern Link Road	AM	40.3	C
	PM	40.8	C

As is the case with the approved traffic generation totals as reported in **Section 4.1**, the SSD Approval inherently provides an approval for the intersection operations reported in the tables above.

5 Modification 2

5.1 Overview

As stated, full details of MOD 2 are provided in the EIS which this TIA accompanies. A reduced scale site plan of Precinct 1 further to MOD 2 is provided in **Figure 15** below.

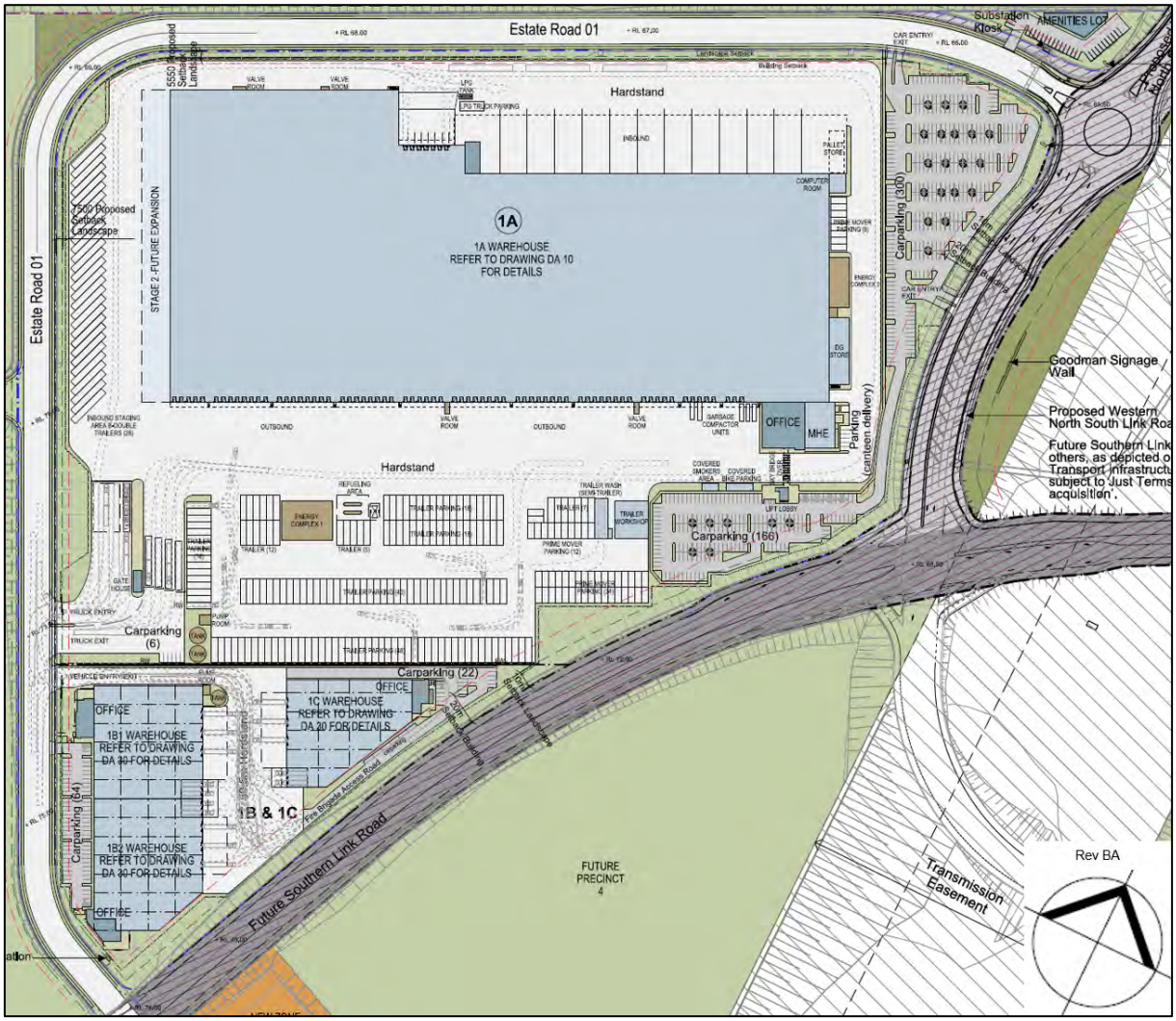


Figure 15: Proposed Precinct 1 Site Plan (MOD 2)

In summary, MOD 2 provides for:

- An additional Warehouse 1A car park access driveway (left-in / left-out) on WNSLR, and
- An increase in the height of Warehouse 1A from the approved 13.7m to between 27.35m and 36.79m.

Table 5 provides a comparison between the MOD 2 and the currently approved SSD for Precinct 1.

Table 5: Precinct MOD 2 and Precinct 1 SSD Approval

Precinct 1 MOD 2	Lot 1A	Lot 1B & 1C	Precinct 1 Total	Precinct 1 2019 Approved Development
Warehouse m^2 GFA	100,562	13,613	114,175	109,914
Office m^2 GFA	2,646	1,257	3,903	6,445
Miscellaneous m^2 GFA	4,004	-	4,004	-
Total m^2 GFA	**107,212**	**14,870**	**122,082**	**116,359**
Car Parking	472	86	558	592
Accessible Parking (included in above)	8	3	11	9
Total Car Parking	**472**	**86**	**558**	**592**

5.2 Lot 1A Distribution Facility Operations

While the warehouses within Lot 1B & 1C are expected to operate as 'standard' warehouses, Lot 1A will operate as a specialised distribution facility. The following sections provide more details in regard to these operations.

5.2.1 Truck Operations

The future tenant has provided the following information regarding future truck movements based on known operational requirements:

Inbound Trucks According to the advice provided to Ason Group it is expected that the inbound trucks would generally be B-Doubles. These trucks bring goods to the distribution centre where they are then unpacked and sorted.

Inbound trucks will be subject to the controls as follows:

- Trucks stop at the boom gate to receive instruction from the gatehouse,
- Trucks will be guided into 1 of 4 free lanes to avoid any blockage,
- The inbound weighbridge dwell time is approximately 1 to 3 minutes. Note all supplier delivery drivers are required to complete inductions in advance. Accordingly, these dwell times are able to be kept to a minimum.

- There is only one inbound weighbridge which is intended to be used **irregularly** for quality assurance.
- After clearing the gatehouse, if a truck cannot proceed straight to inbound docks they will be staged in the B-Double staging bays to avoid any blockage.
- After unloading trucks will proceed back to the gatehouse for exit.

Accordingly, it is not anticipated that the entry trucks will be subject to queuing and will not impact the access crossover. Hence, no adverse impact onto the operation of the traffic on the Estate Road is expected as a result of the design of entry gatehouse and weighbridge.

A supplementary, M/M/1 queue model has been undertaken for the entry point and will be presented in section 8.3 to ascertain that no queueing would occur at the access point.

Outbound Trucks According to the advice provided to Ason Group it is expected that the outbound trucks would generally be articulated vehicles (semi-trailers). These trucks take goods from the distribution centre to individual stores. Similarly to the above, outbound trucks will be subject to the following controls:

- Tenant's drivers will enter via swipe card and as such the dwell time will be less than 1 minute.
- Drivers will then proceed around the warehouse to an available outbound dock, or will be staged on the hardstand
- The hardstand is designed to accommodate the entire fleet of tenant trucks on-site.

5.2.2 Staff

The client has anticipated that a total of 432 staff will be employed at the distribution centre, with the majority being shift workers.

Relevant shift times are broken down as follows:

- Day shift varies but typically 5:00AM–6:00PM
- AM shift 5:00AM–2:30PM
- PM shift 2:30PM–midnight
- Night shift midnight–5:00AM (generally a maintenance shift)

Staff numbers during each relevant shift time period is provided in **Table 6**.

Table 6: Staff Arrangement

Staff Category	Day Shift	AM	PM	Night	Total Staff
Management & Non-direct	27	-	-	4	**31**
Direct	-	106	106	-	**212**
Visitors	10	-	-	-	**10**
Security	-	3	3	2	**8**
Equipment Operators	-	27	27	5	**59**
Automation Maintenance	-	15	15	5	**35**
Truck Drivers	-	33	22	0	**55**
Transport Office	10	-	-	-	**10**
MHE Maintenance		2	2	-	**4**
State Office	8	-	-	-	**8**
TOTAL	**55**	**186**	**175**	**16**	**432**

5.3 Car Parking

5.3.1 Car Parking Access

Car Parking facilities for Lot 1A will be serviced by two driveways, with the primary access point situated along the Estate Road 01. The additional (secondary) left-in/left-out driveway accessing the Warehouse 1A car park is included as part of the MOD 2 submission, providing supplementary access and egress to and from WNSLR.

This driveway is provided in response to the operational and safety requirements of the proposed tenant for Lot 1A. With respect to the additional left-in/left-out access crossover as part of the MOD 2, it is noteworthy that this access will be required for flexibility to the design and as well as providing a permeable traffic flow within the Lot 1A car parking area.

Furthermore, provision of this access is deemed necessary for the staged construction of the Site. While this access will assist in future traffic flow, it is still expected that the Estate Road 01 access to be the primary vehicular crossover for Lot 1A.

Car Parking Facilities for Lot 1B and 1C will be provided with access via Estate Road 01 and the access driveway.

5.3.2 Car Parking Provision

With reference to the SSD Approval, parking is to be provided in accordance with the RMS Guide rates, being:

- 1 space per 300m^2 of warehouse floorspace;
- 1 space per 40m^2 for office floorspace; and
- 1 accessible space per 100 parking spaces.

As indicated in **Table 7**, application of the above rates results in a total minimum requirement of 478 car parking spaces for Precinct 1.

Table 7: Precinct 1 Car Parking Provision

Lot	Warehouse GFA (m^2)	Office GFA (m^2)	Minimum Parking Requirement	Parking Proposed
1A	100,562	2,646	401	472
1B & 1C	13,613	1,257	77	86[1]
Total	**114,175**	**3,903**	**478**	**558**

Notes: 1) Includes Lot 1B1, 1B2 and 1C

In response, the proposed MOD 2 provides 558 parking spaces, which exceeds the assessed minimum parking requirements. With respect to Lot 1B & 1C, the proposed 86 parking spaces distributed through the Lot is expected to satisfy the minimum parking requirements for each tenancy.

In summary the parking provision of the Site is deemed sufficient to meet the proposed demand for MOD 2.

5.3.3 Accessible Parking

In response to the accessible parking rate of 1 accessible space per 100 parking spaces (or part thereof), MOD 2 provides a total of 11 accessible spaces as follows:

- **Lot 1A:** 8 accessible spaces
- **Lot 1B & 1C:** 3 accessible spaces

These provisions readily satisfy the nominal requirement and shall comply with AS 2890.6.

5.3.4 Motorcycle Parking

It is noted that MOD 2 also provides 6 motorcycle parking spaces for Lot 1A.

6 Modification 2 Traffic Assessment

6.1 Lot 1A Traffic Generation

6.1.1 Truck Trips

As discussed in **Section 5.2.1**, in accordance with the anticipated operational information for Lot 1A, this tenancy is expected to generate up to 50 truck trips in a peak hour (24 Supplier and 26 Store Trucks), which coincides with both the AM and PM network peak periods. This is anticipated to increase by 4 truck trips during seasonal peak operation for the warehouse.

The client has provided information regarding the temporal breakdown of the anticipated supplier and store truck movements, for a typical, standard operation day and a seasonal peak day. The movements have been attached in **Appendix B** for reference. It is noteworthy, that the seasonal peak demand is only expected to occur 6 weeks per annum. Nevertheless, this TIA has conservatively adopted the peak period traffic movements rather than the information relevant to a typical period. This results in a robust assessment and should be considered as an additional level of assurance for traffic analysis.

6.1.2 Staff Trips

Similar to above, the expected staff movements for Lot 1A have been provided by the client in the form of a temporal breakdown. The relevant operational peak periods are summarised below in **Table 8**, with the complete movements attached for reference in **Appendix B**.

The temporal breakdown of staff trips to Lot 1A results in a total of 414 staff movements during typical operational periods. It should be noted that the anticipated staff numbers provided in Table 6 provides for a total of 432, indicating a private vehicle trip rate of approximately 96%. This is reflective of sites referred to in the TDT 13/14a that are similar in nature to the Lot 1A development.

Table 8: Staff Trips Peak Periods

Period	Time	Standard Day		Peak Operations	
		Arrivals	Departures	Arrivals	Departures
Warehouse AM Peak	4:00 – 5:00	129	0	161	0
Network AM Peak	7:00 – 8:00	20	0	25	0
Warehouse PM Peak	13:00 – 14:00	173	129	216	161
Network PM Peak	16:00 – 17:00	0	20	0	25
Warehouse Night Peak	22:00 – 23:00	0	173	0	216
Daily Total	0:00 – 0:00	414	414	517	517

6.1.3 Total Traffic Generation

With reference to both staff and truck movements, the shift structure for Lot 1A results in moderate traffic flows in the AM and PM commuter peak periods, though it is acknowledged that it would generate higher traffic flows outside of those peak hours - particularly at the start and end of the main warehouse shift periods. These peaks are identified in the total traffic generation (trucks + vehicle trips) movements for the warehouse 1A in **Table 9** below.

Table 9: Total Trips during Peak Periods

Period	Time	Trucks Total (Arrivals + Departures)		Staff Total (Arrivals + Departures)		Total Trips	
		Standard	Peak	Standard	Peak	Standard	Peak
Warehouse AM Peak	4:00 – 5:00	50	54	129	161	179	215
Network AM Peak	**7:00 – 8:00**	**50**	**54**	**20**	**25**	**70**	**79**
Warehouse PM Peak	13:00 – 14:00	50	54	302	377	352	431
Network PM Peak	**16:00 – 17:00**	**50**	**54**	**20**	**25**	**70**	**79**
Warehouse Night Peak	22:00 – 23:00	50	54	173	216	223	270
Daily Total	**0:00 – 0:00**	**950**	**1,188**	**828**	**1,034**	**1,778**	**2,222**

According to the above table the Lot 1A is anticipated to generate the following traffic generation during the road network AM and PM peak hours:

- 70 veh/hr under standard operation and 79 veh/hr during peak demand.

6.2 Lots 1B & 1C Traffic Generation

Lots 1B & 1C will provide for 'standard' warehouse development. With reference to the SSD Approval warehouse trip rates (from the RMS Guide Update) these lots would generate approximately 24 vph during the AM and PM peak periods and 281 total vehicles throughout the day.

6.3 Precinct 1 Total Traffic Generation

From the sections above, the total traffic generation of Precinct 1 further to MOD 2 is summarised in **Table 10**. Note that for conservative estimation, the Network AM and PM Peak periods in Table 9 have been allocated to the Precinct 1 MOD 2 Peak periods, as these peak periods occur at slightly different times.

Table 10: Precinct 1 (MOD 2) Total Trip Generation

Network Peak	Lot 1A	Lot 1B & 1C	Total Precinct 1 Trips	2019 Approved Development[1]
AM & PM Peaks	70 (79)	24	94 (103)	190
Daily	1,778 (2,222)	281	2,059 (2,503)	2,202

Notes: Numbers in brackets indicate the totals for Seasonal Peak operation.

1) Obtained from approved traffic generation referenced in Section 4.3.

6.3.1 Active and Public Transport

Trips generated by non-car travel modes (e.g. pedestrian, cycling and public transport) represent a relatively low proportion of overall trips expected to be generated by the Estate, having regard for the existing availability of services and connections. As such, the minor changes as a result of MOD 2 will not greatly impact the number of public transport, pedestrian or cyclist trips generated.

6.4 Precinct Traffic Impacts

With reference to **Table 10**, the traffic generated by Precinct 1 during the AM and PM Peaks is 96 vehicles less than forecast under the current SSD Approval during the standard operational period, and 87 vehicles less during the seasonal peak period. Accordingly, the Precinct 1 is expected to have less traffic impact than the 2019 approval.

Similarly, daily total traffic generation for the Precinct during the standard operational period is 143 vehicles less than the SSD approval. Accordingly, under normal operational period during the year the proposed MOD will have less daily traffic impact when compared to the 2019 approval.

It is noted that the seasonal peak period (only for short period of year) exceeds the daily traffic figures by 301 vehicles per day. It is important to note that the hourly traffic volumes have been estimated to be less than the 2019 approval even during the peak seasonal demand.

Previous traffic modelling assessments submitted as part of the SSD application conclusively showed that – further to planned (and subsequently Conditioned) upgrades to the road network – key intersections in the vicinity of the OWE would operate at appropriate levels of service through 2036.

Given that those upgrades (which are unchanged further to MOD 2) have been inherently approved by all key consent agencies and moreover that the peak generation of Precinct 1 will now be lower than previously estimated, it can be concluded that MOD2 will have no significant impact on the operation of the local road network.

Accordingly, no additional traffic modelling including intersection analysis are deemed necessary.

6.5 Estate Wide Traffic Impacts

Considering the above results, the wider Estate traffic generation is accordingly impacted by the reduction in traffic for Precinct 1. The below table captures the 2019 Approved Development traffic volumes referred in the approved DA, compared with the updated yield for MOD 2. Of note, Precincts 2 through 5 use the approved traffic generation rates for Warehouse development referred in Section 3.3, however vary in Traffic Generation due to adjusted GFA's.

Table 11: Estate Traffic Generation

Precinct	2019 Approved Development			MOD 2 Traffic Generation[1]		
	GFA m2	AM / PM	Daily	GFA m2	AM / PM	Daily
Precinct 1	116,359	190	2,202	122,082	94	2,059
Precinct 2	105,425	172	1,995	107,111	175	2,027
Precinct 3	9,9967	163	1,891	102,466	167	1,939
Precinct 4	120,988	197	2,289	113,693	185	2,151
Precinct 5	32,530	53	615	35,640	58	674
Total	**475,269**	**775**	**8,992**	**480,992**	**679**	**8,850**

Notes: 1) It is noted that Precinct 2 to 5 have slightly different GFAs when compared to the 2019 Approved Development. However, in the scheme of the broader OWE there is no net change and traffic generation remains effectively the same.

The table above demonstrates that the cumulative impacts of MOD 2 yield to the hourly peak periods are lower (96 in the hourly peak windows and 142 for daily volumes) than that of the 2019 approved development peak hourly volumes. Of important note is that this is directly attributed to the updated MOD 2 trip generation of Precinct 1, given that there is no cumulative GFA change or total trips in considering Precincts 2 through 5. According to the above table, the estate wide traffic generation after

MOD 2 will be less than 2019 approved traffic generation. As such the traffic impact of the Estate is expected to be less than the 2019 approval.

7 Construction Traffic Management Plan

A separate Construction Traffic Management Plan (CTMP) (ref: 0129r06v3) for the Site, and a further MOD 1 Traffic Impact Statement (ref: 0950l01) has been provided to address the construction traffic of the OWE Precinct more comprehensively.

Accordingly, regarding the CTMP reference shall be made to the above documents. However, for completeness a summary of the CTMP results are provided as follows.

7.1 Construction Traffic Generation

A summary of daily traffic volumes — based on updated projections — both prior to and following completion of the WNSLR is provided in below table. It is noted that the construction traffic forecasts included in the original SSD submission were indicative only; anticipating that further refinement of numbers would occur as part of future Construction Traffic Management Plans (CTMPs), included within the CEMP submitted separately. Nevertheless, these figures are reproduced below for ease of comparison, despite some changes naturally being expected within input from contractors as has now occurred.

Table 12: Construction Traffic Comparison

	Prior to WNSLR Completion		**Post Completion of WNSLR**	
Vehicle Class	*RtS Report*	*Cumulative*	*RtS Report*	*Cumulative*
LV	160	620	Not specified	200
HV	300	680	Not specified	1,200
Total	460	1,300	<8,992[1]	1,400

Notes: 1) Total daily traffic in Table 3 of RtS TIA, dated 27/11/2018

7.2 Impacts on Surrounding Network

Construction traffic will initially use Bakers Lane to access the work area for preliminary works. Specific measures are proposed to respond to the existing congestion associated with the Bakers Lane schools. Indeed, further limitations on vehicular access via Bakers Lane are included within this Plan to ensure that large numbers of vehicles, particularly heavy vehicles, will be minimised during peak periods.

Highest construction traffic volumes will occur after completion of the WNSLR, providing an alternative access to OWE. Nevertheless, construction traffic is **substantially** less than this future operational traffic and will therefore not have any unacceptable impacts on the surrounding road network.

In summary, based on the traffic numbers currently envisaged as well as the CTMP reports, the construction traffic impacts are considered acceptable.

8 Design Commentary

The site accesses, car park and commercial vehicle facilities of the development (and access thereto) are generally designed to comply with the requirements of DCP, as well as the following relevant Australian Standards:

- AS2890.1 for car parking areas,
- AS2890.2 for commercial vehicle loading areas,
- AS2890.3 for bicycle parking, and
- AS2890.6 for accessible (disabled) parking.

It is expected that any detailed construction drawings in relation to the car park, site access and commercial vehicle facilities would comply with these Standards. Furthermore, compliance with the above Standards would be expected to form a standard condition of consent to any development approval and subject to further review as part of future detailed Construction Certificate design process.

8.1 Design Vehicle

A 26.0m B-double has been adopted as the relevant 'design vehicle' for the facility and Estate Roads. Car parking areas are designed as User Class 1A parking, predominantly being used by employees.

8.2 Access and Internal Design

Access to the commercial hardstand area associated with all warehouses has been tested for B - Doubles. Recessed docks have been designed for use by up to 19m articulated vehicles.

Swept path analysis and a detailed review of the development site plans have been undertaken — and included in **Appendix A** — to confirm that the design generally complies with the above Standards.

8.3 Vehicle Queueing – Lot 1A

As discussed in Section 5.2.1, there queueing from Lot 1A weighbridge is not anticipated to be an issue. It is anticipated that no queueing will occur for inbound vehicles, with the hardstand area providing sufficient areas for pulling over. There will only be 1 weighbridge situated at the entry point to the hardstand area which will only function for randomised Quality Assurance processes and is not expected to contribute to any queueing or delays. Accordingly, there would not be any adverse impact on the proposed access point onto Estate Road 01.

However, to further assess the queueing opportunities at the inbound gate, a queue analysis has been undertaken having regard for a M/M/1 queueing methodology.

Information provided from the client has indicated that the maximum number of inbound truck movements is likely to be 8 trucks over one hour, which would utilise a single weighbridge for a maximum of 3 minutes. It is noted that the dwell time would be generally less than 3 minutes and can even further be reduced by means of appropriate management. However, for conservative assessment the maximum 3 minutes have been adopted.

Accordingly, the statistical analysis demonstrates that under these conditions there would likely be no queue from the proposed single weighbridge. Accordingly, there would be no issues with the operation of the weighbridge and there would be no adverse impact on the traffic operation of the access point and Estate Roads as a result of this weighbridge.

9 Conclusions

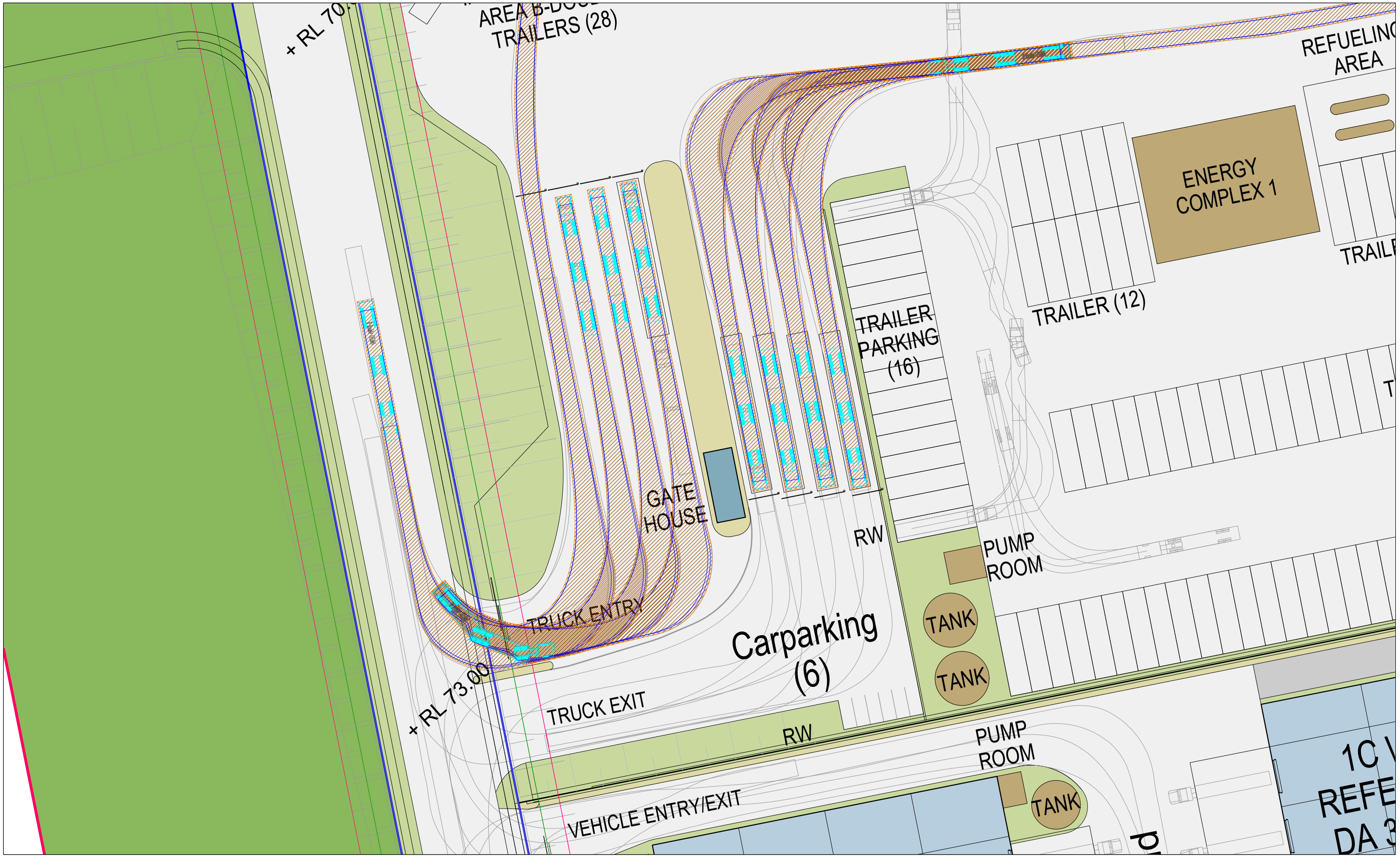
Ason Group has been engaged by Goodman to prepare a TIA to assess the access, traffic and parking implications of MOD 2 to SSD 7348, specifically relating to Precinct 1 of the OWE. Further to a detailed assessment, Ason Group has concluded that:

- A total of 558 car parking spaces are proposed across Precinct 1, which exceeds the minimum parking requirements based on RMS Guide rates (as referenced in the SSD Approval).
- Precinct 1, further to MOD 2 is expected to generate a maximum of 103 vph in the network peak periods, which is less than generated by Precinct 1 under the current SSD Approval Precinct 1 Master Plan (2019 approval).
- As such, the operation of key intersections and the local road network further to proposed and conditioned upgrades (which remain unchanged by MOD 2) would generally operate at the same or improved levels of service than inherently provided for under the 2019 SSD Approval.
- Precinct 1 is expected to generate 2,059 vpd during standard operational periods, and 2,503 vpd during the seasonal peak operations period. While standard operations are less than the 2019 approved 2,202 vpd, this is exceeded for a short time period during seasonal peak operation by 301 vehicles.
- On the basis that this only occurs for 6 weeks during the end-of-year period, the additional vehicle trips can be accommodated by the road network. Additionally, this minor exceedance during short period of time is acceptable when considering the traffic impacts of the wider Oakdale West Estate.
- Accordingly, the proposed MOD 2 would result in the broader Estate to generally have less traffic impact during critical peak hours as well as daily traffic volumes when compared to the approved 2019 development.
- All internal roads, access driveways, car parks and service areas have been designed with reference to the DCP and appropriate Australian Standards. It is expected that a Condition of Consent requiring full compliance with such will be applied to all future Development Applications.

In summary, the access, traffic and parking characteristics of MOD 2 are supportable on traffic and transport grounds.

Appendix A

Swept Path Analysis



Notes:
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File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
B-Double Swept Path Analysis
B-Double (26m)

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK01

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Suite 5.02, Level 5, 1 Castlereagh Street
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Notes:

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Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
B-Double Swept Path Analysis
B-Double (26m)

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK02

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,212 sqm	
3,620 sqm	
57	%
0.57	: 1
88,610 sqm	
13,925 sqm	
	54
	164
or Gatehouse)	472
31,972 sqm	
	4,625 sqm
	4,998 sqm
	3,990 sqm
	500 sqm
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	14,870 sqm
	2,095 sqm
	47 %
c. awning)	0.47 : 1
Ratio	
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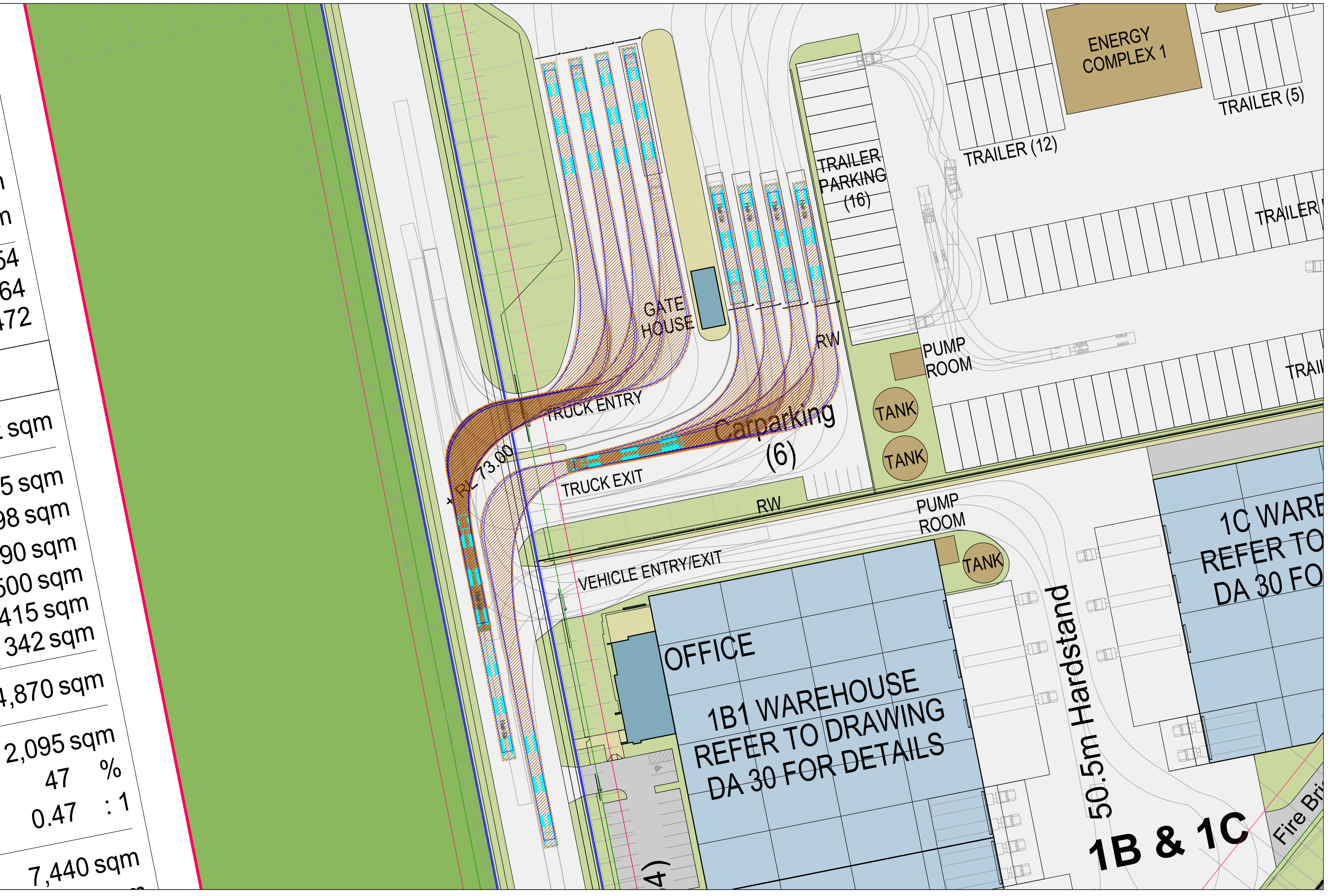

Notes:
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Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
B-Double Swept Path Analysis
B-Double (26m)

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
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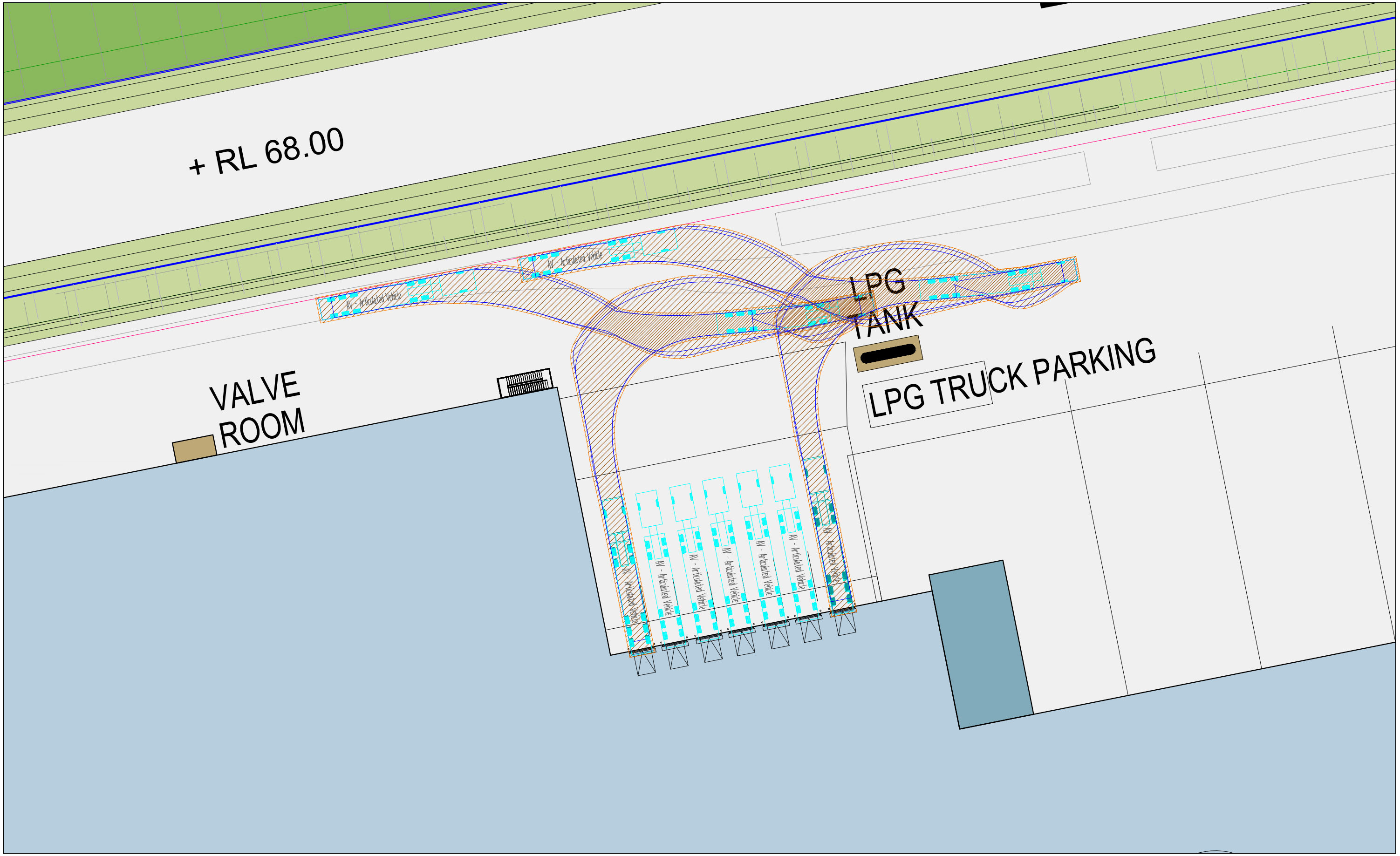

Notes:
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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
AV Recessed Docks (north)
AV (19m)

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK04

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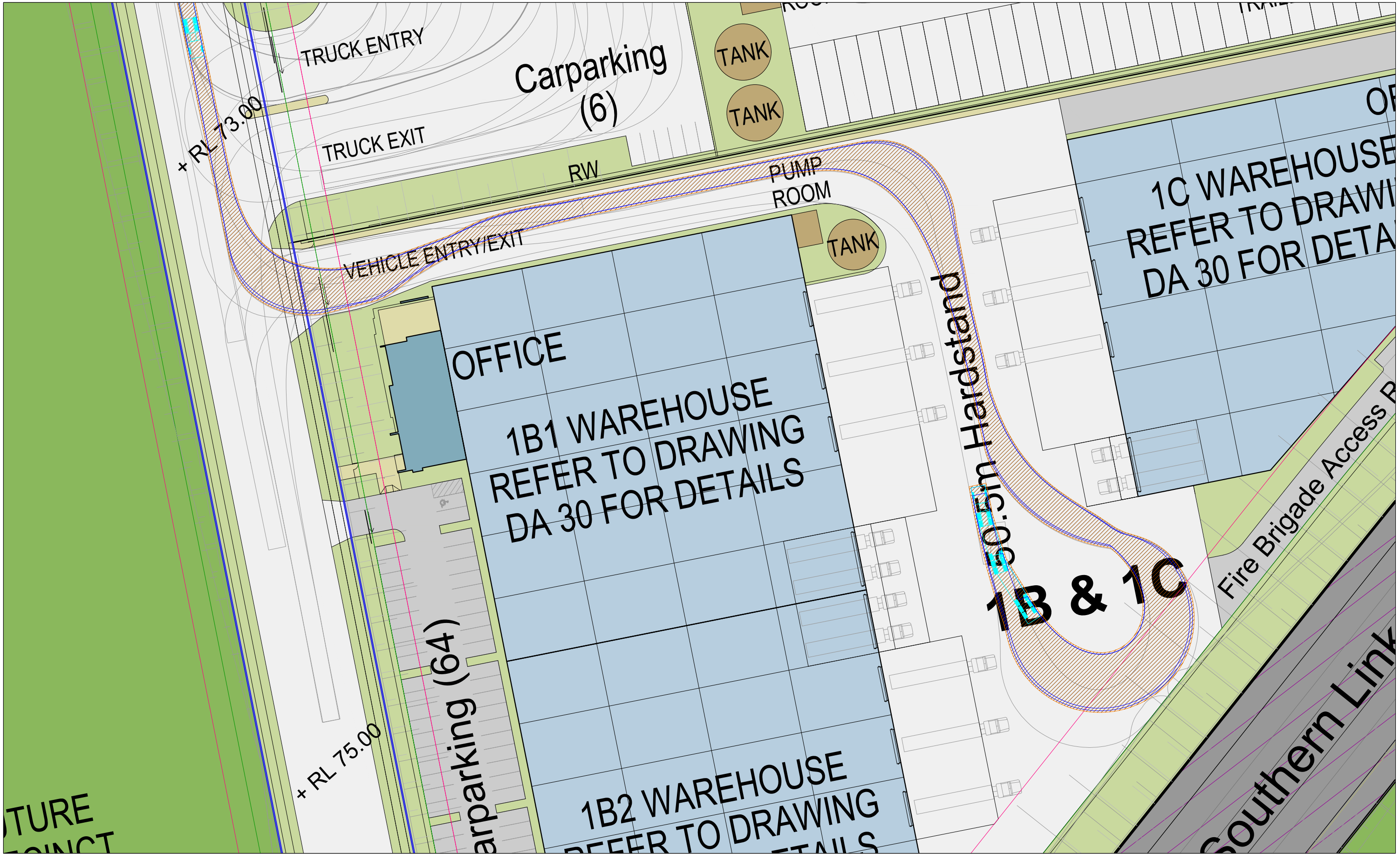

Notes:
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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
B-Double Swept Path Assessment
B-Double (26m)

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK05

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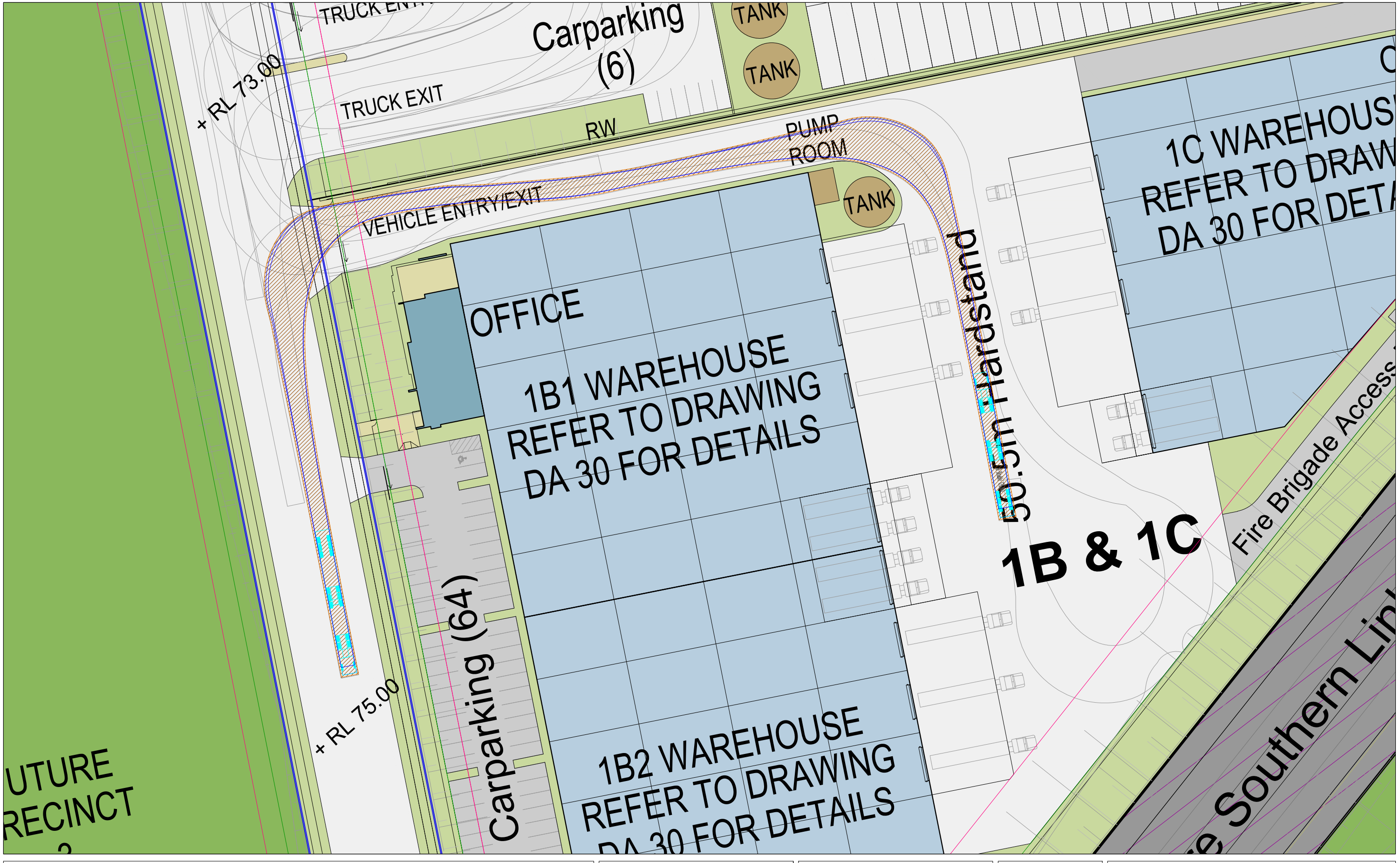

Notes:
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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
B-Double Swept Path Assessment
B-Double (26m)

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK06

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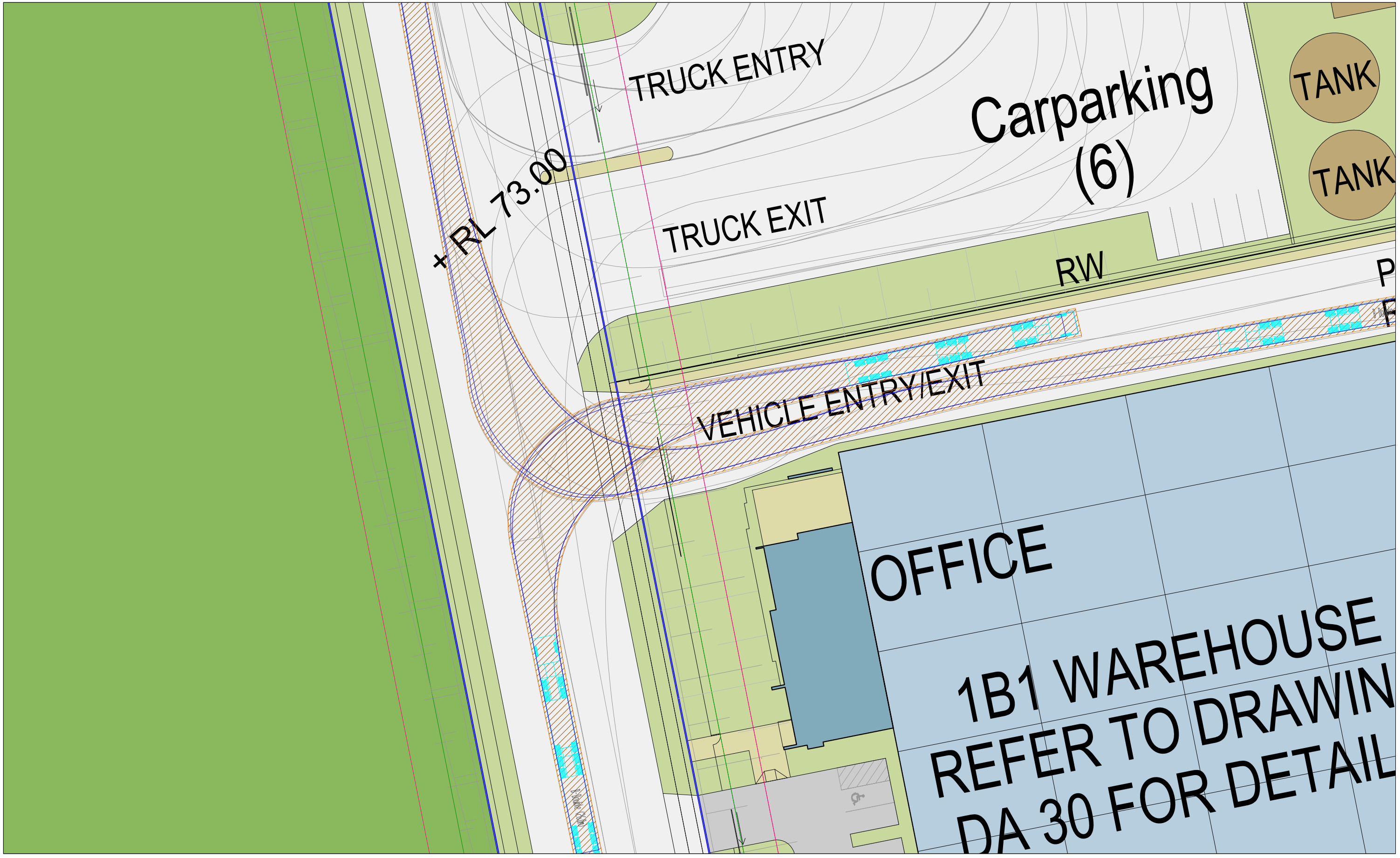

Notes:
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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precint 1

Drawing Title:
B-Double Swept Path Assessment
B-Double (26m)

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK07

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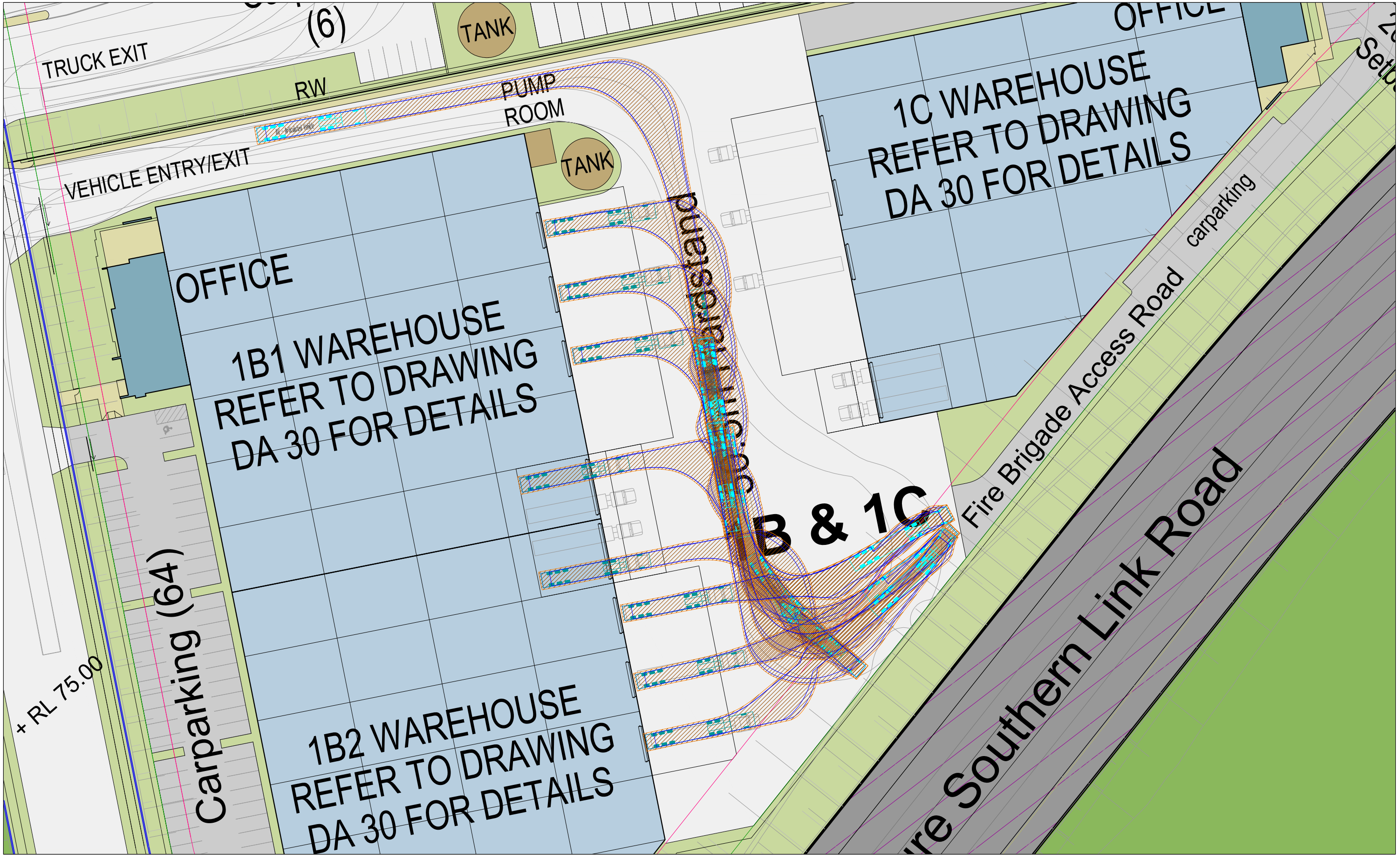

Notes:
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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
Articulated Vehicle (19m)

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK08

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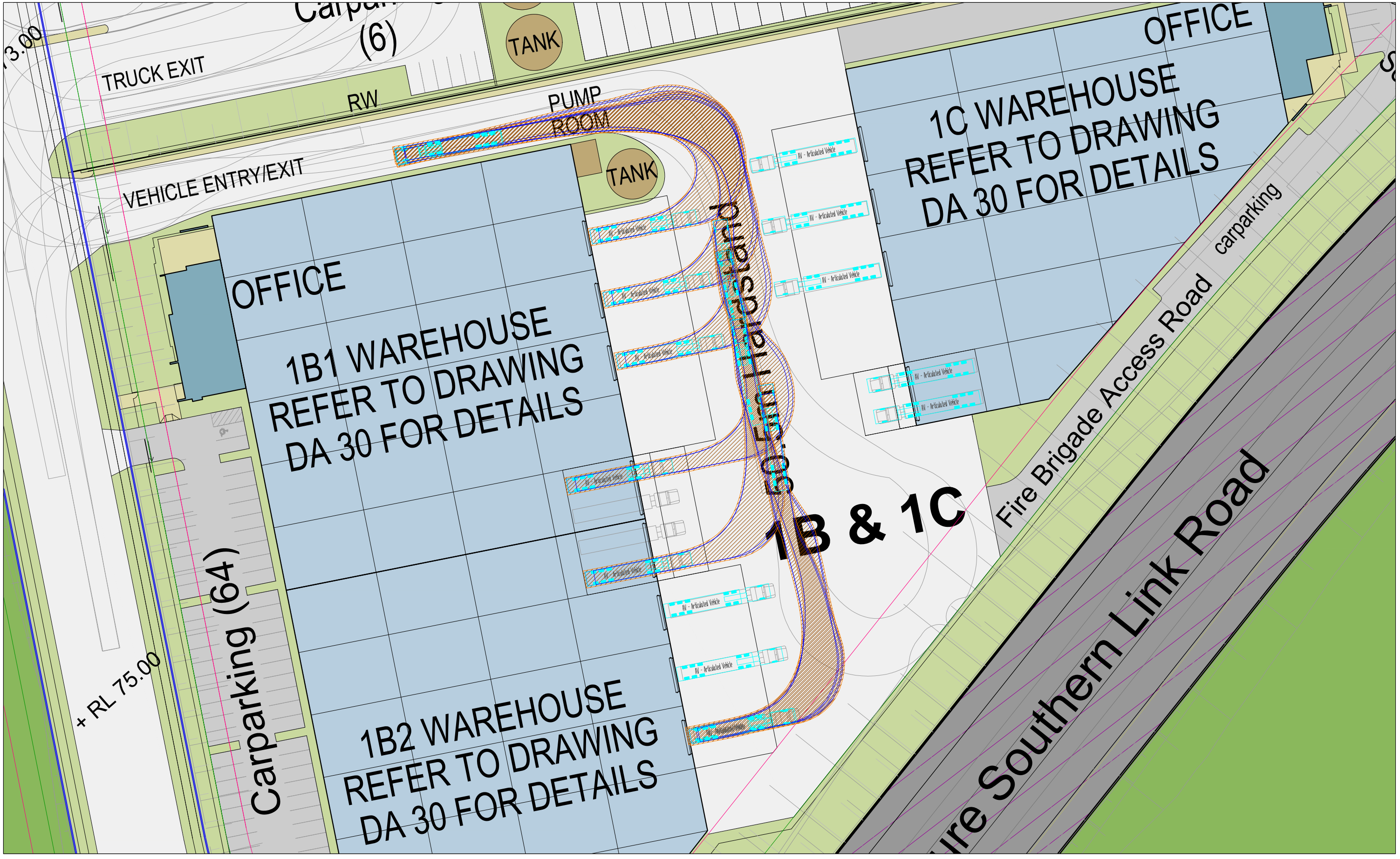

Notes:

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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
Articulated Vehicle

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK09

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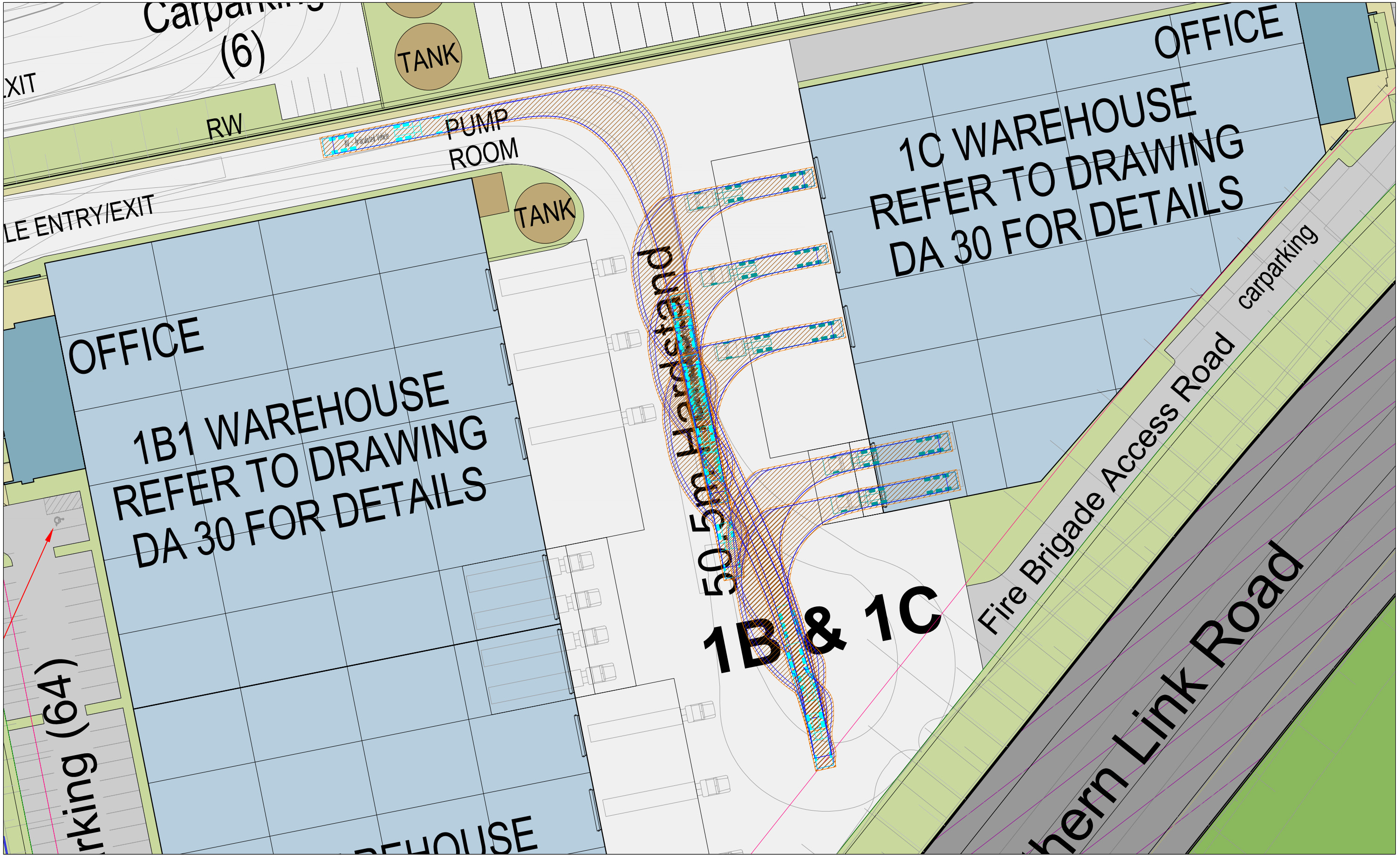

Notes:
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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
Articulated Vehicle

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK10

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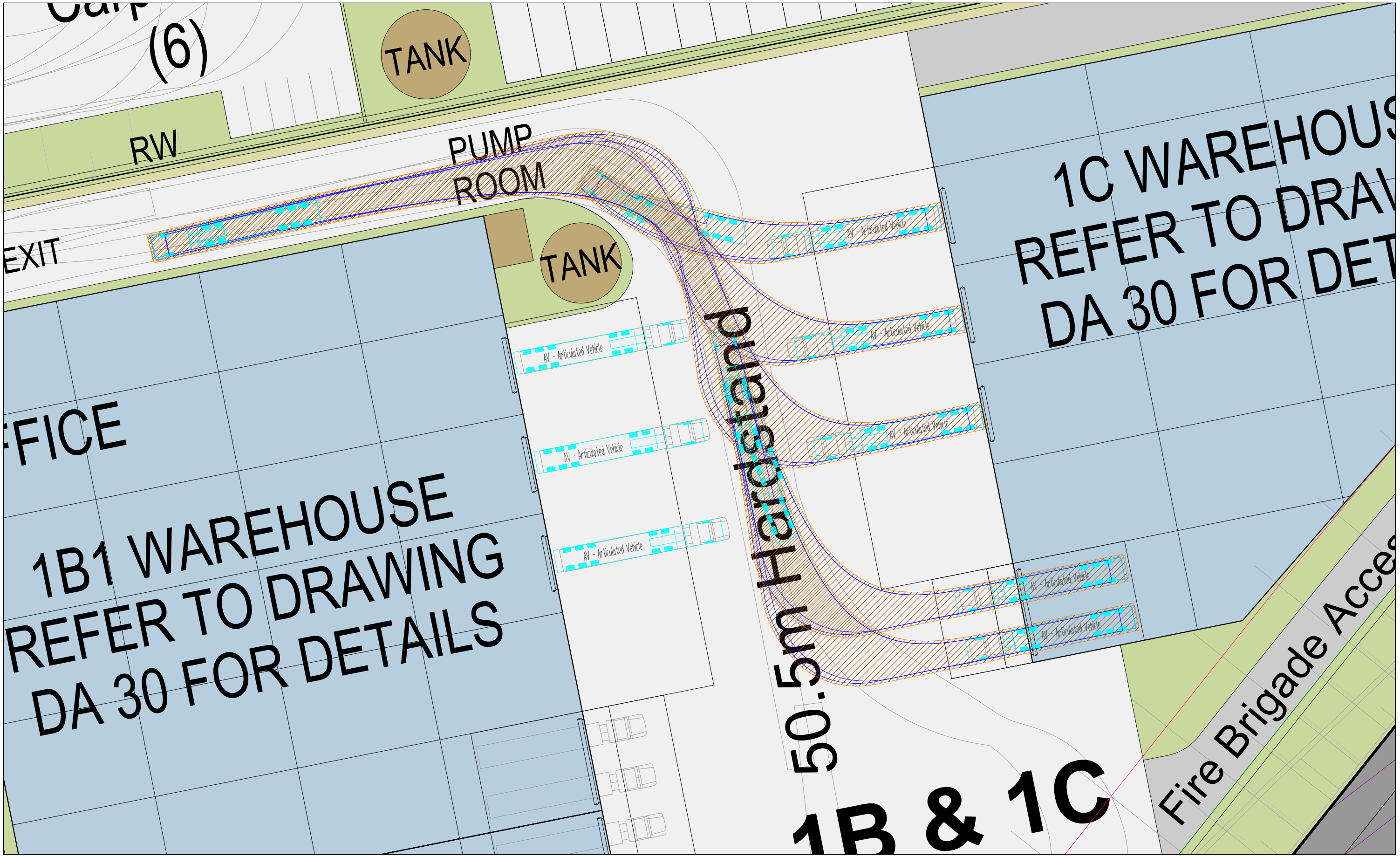

Notes:
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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
Articulated Vehicle

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK11

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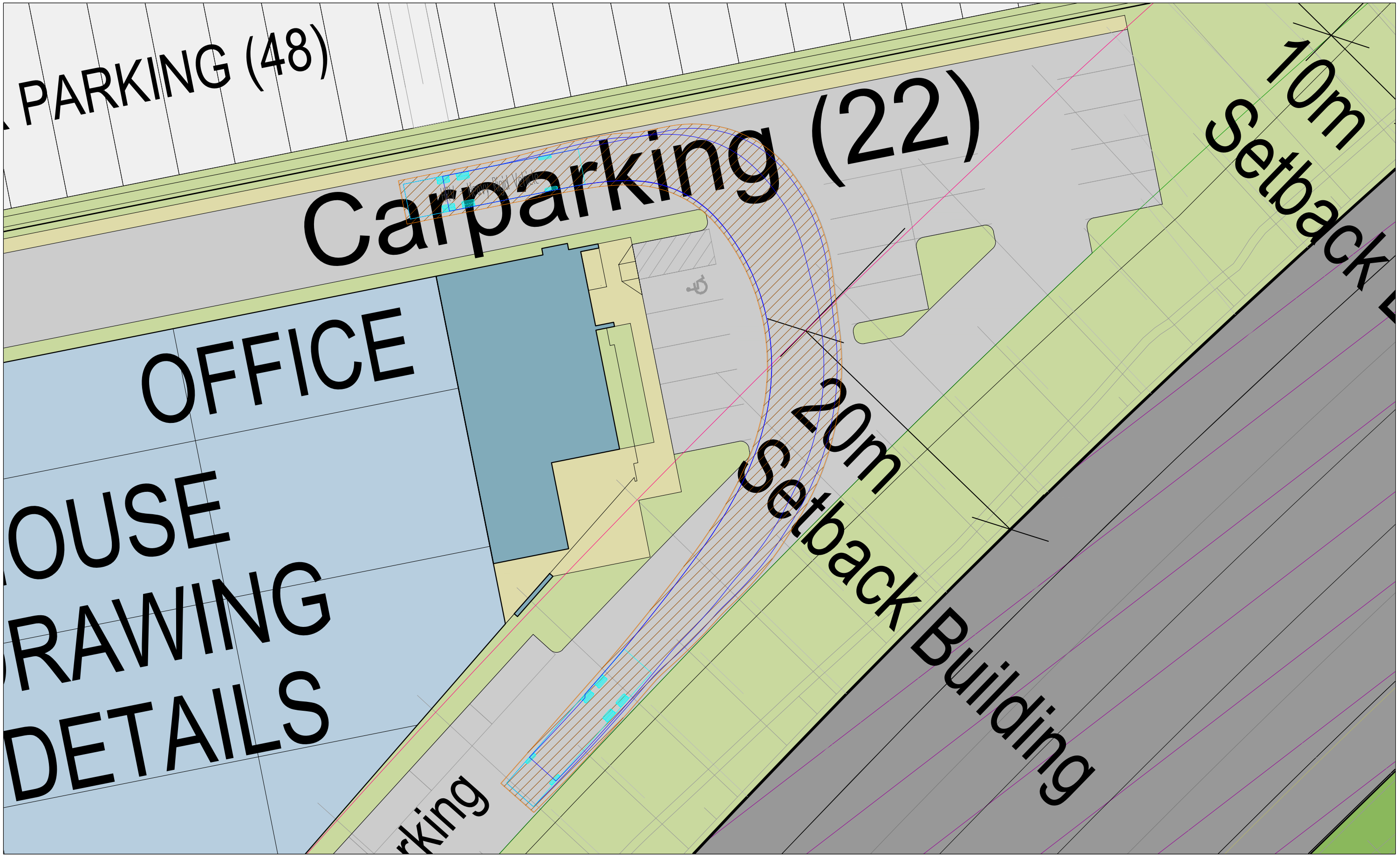

Notes:
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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate Precinct 1

Drawing Title:
Articulated Vehicle

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK12

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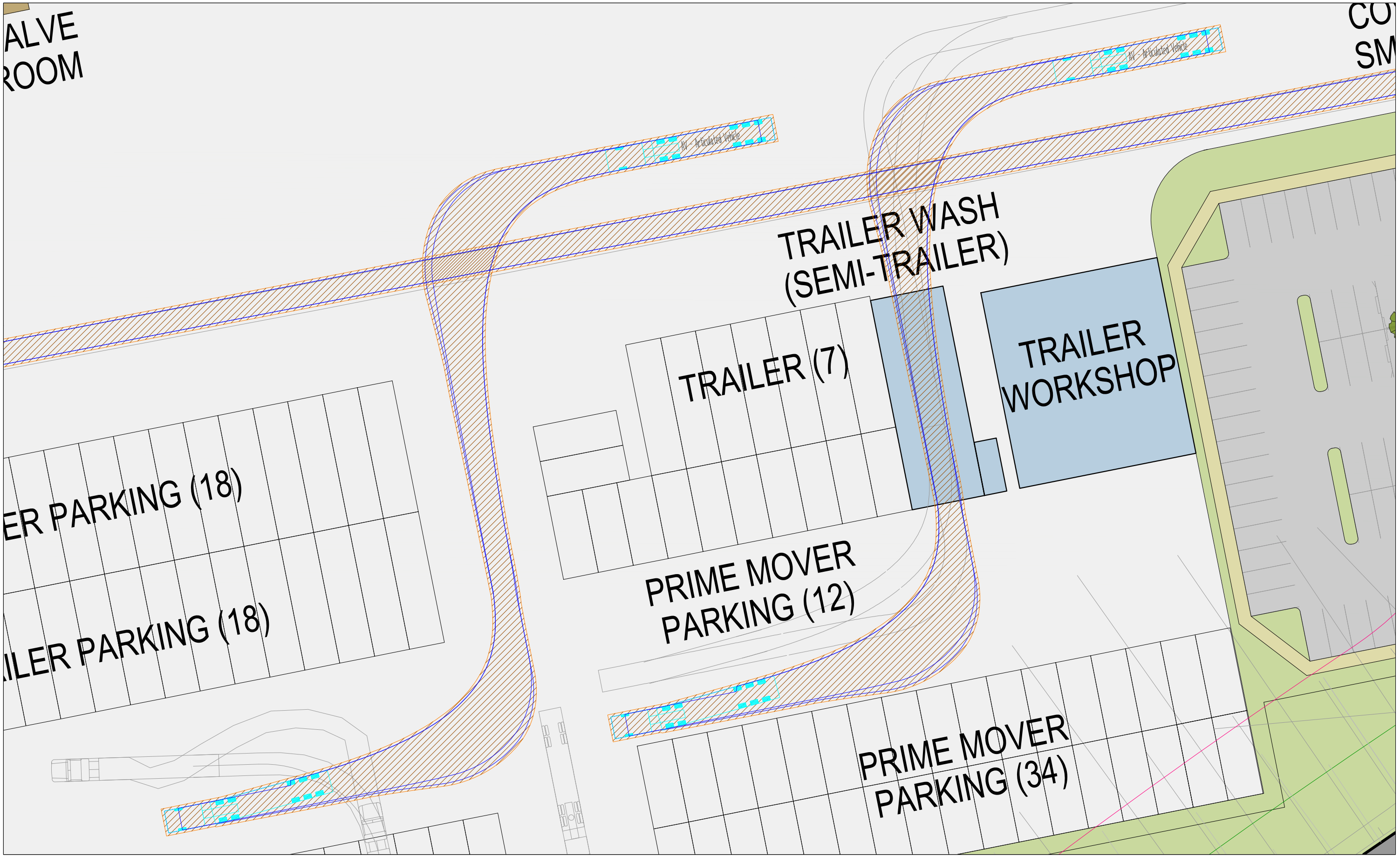

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Document Info:
Drawn by: MatthewTangonan
File name: P0950d10_Design Advice_B.dwg

Client:
Goodman

Project:
P0950
Oakdale West Estate

Drawing Title:
Articulated Vehicle
Trailer Wash Access & Egress

Date:
16-Oct-19

Scale @ A3:
NTS

Drawing Number:
SK13

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Appendix B

Warehouse 1A Vehicle Movement Information

Anticipated Standard Day Vehicle Movements - Lot 1A

		Trucks				Cars		Total		
		Arrival		Departure		Arrival	Departure			All trips
FROM	TO	Supplier Trucks	Store Trucks	Supplier Trucks	Store Trucks			Trucks	Cars	
0:00	1:00					16		0	16	**16**
1:00	2:00							0	0	**0**
2:00	3:00							0	0	**0**
3:00	4:00							0	0	**0**
4:00	5:00					129		0	129	**129**
5:00	6:00	12	13	12	13	75		50	75	**125**
6:00	7:00	12	13	12	13	1		50	1	**51**
7:00	8:00	12	13	12	13	20		50	20	**70**
8:00	9:00	12	13	12	13			50	0	**50**
9:00	10:00	12	13	12	13		16	50	16	**66**
10:00	11:00	12	13	12	13			50	0	**50**
11:00	12:00	12	13	12	13			50	0	**50**
12:00	13:00	12	13	12	13			50	0	**50**
13:00	14:00	12	13	12	13	173	129	50	302	**352**
14:00	15:00	12	13	12	13		75	50	75	**125**
15:00	16:00	12	13	12	13		1	50	1	**51**
16:00	17:00	12	13	12	13		20	50	20	**70**
17:00	18:00	12	13	12	13			50	0	**50**
18:00	19:00	12	13	12	13			50	0	**50**
19:00	20:00	12	13	12	13			50	0	**50**
20:00	21:00	12	13	12	13			50	0	**50**
21:00	22:00	12	13	12	13			50	0	**50**
22:00	23:00	12	13	12	13		173	50	173	**223**
23:00	0:00	12	13	12	13			50	0	**50**
		228	**247**	**228**	**247**	**414**	**414**	**950**	**828**	**1,778**

Anticipated Peak Day Vehicle Movements - Lot 1A

		Trucks				Cars		Total		
		Arrival		Departure		Arrival	Departure			All trips
FROM	TO	Supplier Trucks	Store Trucks	Supplier Trucks	Store Trucks			Trucks	Cars	
0:00	1:00	13	14	13	14	20	0	54	20	**74**
1:00	2:00	13	14	13	14	0	0	54	0	**54**
2:00	3:00					0	0	0	0	**0**
3:00	4:00					0	0	0	0	**0**
4:00	5:00	13	14	13	14	161	0	54	161	**215**
5:00	6:00	13	14	13	14	94	0	54	94	**148**
6:00	7:00	13	14	13	14	1	0	54	1	**55**
7:00	8:00	13	14	13	14	25	0	54	25	**79**
8:00	9:00	13	14	13	14	0	0	54	0	**54**
9:00	10:00	13	14	13	14	0	20	54	20	**74**
10:00	11:00	13	14	13	14	0	0	54	0	**54**
11:00	12:00	13	14	13	14	0	0	54	0	**54**
12:00	13:00	13	14	13	14	0	0	54	0	**54**
13:00	14:00	13	14	13	14	216	161	54	377	**431**
14:00	15:00	13	14	13	14	0	94	54	94	**148**
15:00	16:00	13	14	13	14	0	1	54	1	**55**
16:00	17:00	13	14	13	14	0	25	54	25	**79**
17:00	18:00	13	14	13	14	0	0	54	0	**54**
18:00	19:00	13	14	13	14	0	0	54	0	**54**
19:00	20:00	13	14	13	14	0	0	54	0	**54**
20:00	21:00	13	14	13	14	0	0	54	0	**54**
21:00	22:00	13	14	13	14	0	0	54	0	**54**
22:00	23:00	13	14	13	14	0	216	54	216	**270**
23:00	0:00	13	14	13	14	0	0	54	0	**54**
		286	**308**	**286**	**308**	**517**	**517**	**1,188**	**1,034**	**2,222**