

## Traffic Impact Assessment

Oakdale West Estate

State Significant Development Application – Response to Submissions

Ref: 0129r04v02  
27/11/18

[Info@asongroup.com.au](mailto:Info@asongroup.com.au) | +61 42 9083 6601 | Suite 1202, Level 12, 220 George Street, Sydney NSW 2000

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# 1 Introduction

## 1.1 Background

Ason Group has been engaged by Goodman Property Services (Aust) Pty Ltd (Goodman) to prepare an updated Traffic Impact Assessment (TIA) in Response to Submissions for the State Significant Development application (SSDA) supporting the staged development of the Oakdale West Industrial Estate (OWE).

The OWE consists of 154 hectares of land, located within the Western Sydney Employment Area (WSEA). It lies within the Penrith Council Local Government Area (LGA), however, as a State Significant Development, the SSDA is to be assessed by the NSW Department of Planning and Environment (DP&E).

The SSDA comprises the third of four development stages for the broader Oakdale Industrial Estate. It generally seeks approval for:

- A Master Plan for OWE, establishing road layouts (including regional road connections), development precincts, building footprints and proposed development controls for future development of individual lots,
- The subdivision of OWE into 5 development super lots, or “Precincts”,
- The staged delivery of essential infrastructure including the Western North South Link Road (WNSLR), and
- Stage 1 building works, specifically comprising the construction and operation of 3 warehouse and distribution facilities in Precinct 1.

This TIA is based on the updated Master Plan prepared by SBA Architects dated on 21 September 2018. The key changes comparing to the previous plans are summarised as follow:

- The intersection of WNSLR with Lockwood and Estate Road 01 are changed from signalised intersections to roundabouts. This is in response to discussions with Roads and Maritime Services (RMS) having regard for further consideration of relevant signal “warrants”.
- Alternations to the site layout resulting in the reduction in total Gross Floor Area (GFA) of the OWE from 476,573m<sup>2</sup> to 475,269m<sup>2</sup>, and
- Alternations to the site layout resulting in the reduction in total GFA for Stage 1 from 118,025m<sup>2</sup> to 116,359m<sup>2</sup>.

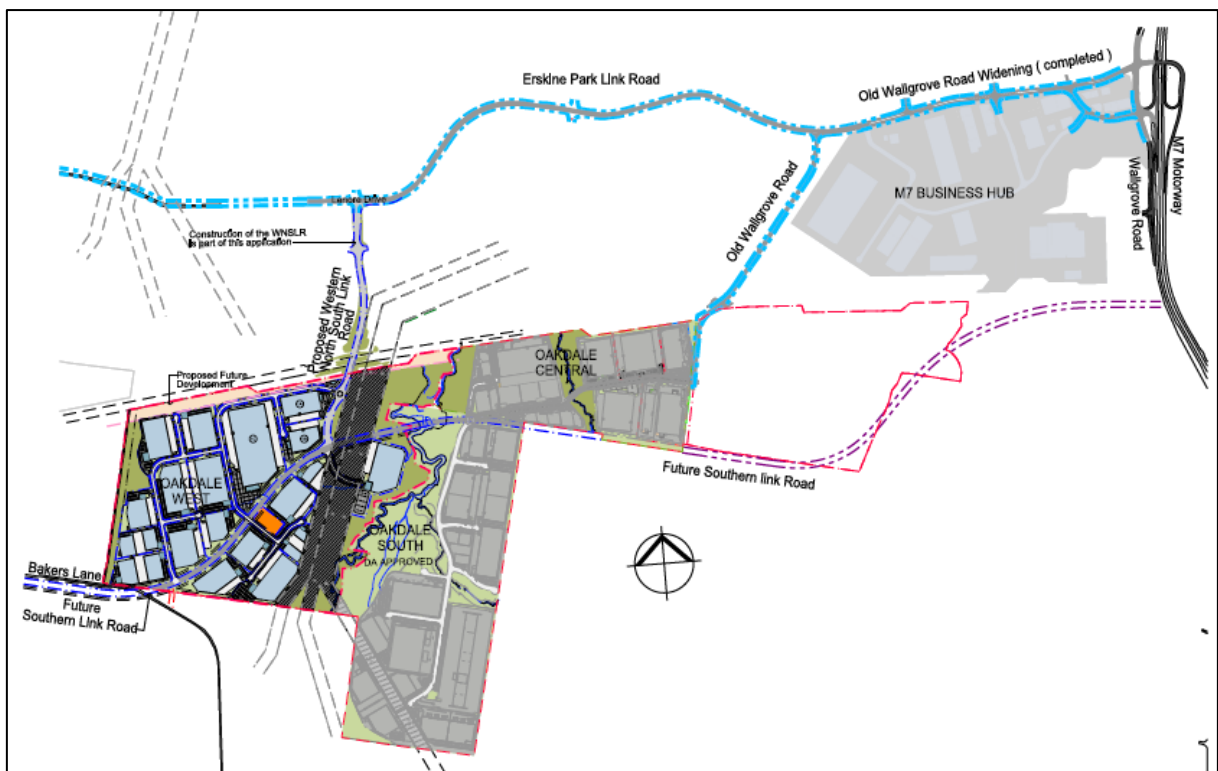
Having regard for the above, this updated TIA seeks to address the above changes as part of a comprehensive report.



## 1.2 Site Overview

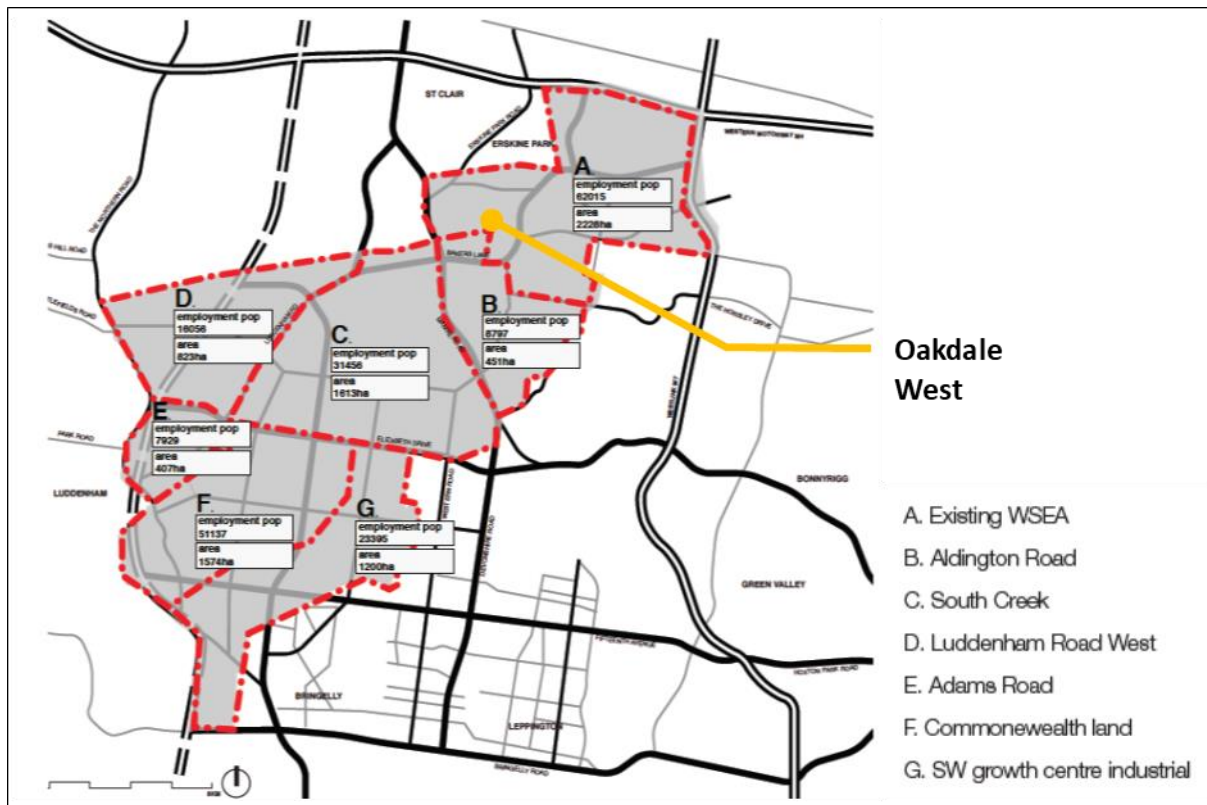
The broader Oakdale Industrial Estate comprises some 421 hectares of industrial-zoned land within the broader WSEA, to the immediate south of the Sydney Water Pipeline (previously referenced as Lands South of Sydney Water Pipeline). OWE is located within the broader Oakdale Industrial Estate and it adjoins other Oakdale Estates to the east and southeast (Oakdale Central and Oakdale South, respectively) as shown in **Figure 1**. The OWE is irregular in its configuration, located to the west of the transmission easement running through OWE and forms the western extent of the Precinct 8 (referred to as Lands South of Sydney Catchment Authority Warragamba Pipelines). Lands further south are rural and rural-residential in character. The OWE is approximately 154 hectares including approximately 88.9 hectares of developable areas.

It is noted that the current *Draft Structure Plan* for the WSEA proposes the inclusion of lands to the south of OWE at Kemps Creek in an expansion of the WSEA. Once implemented, it is anticipated that a future formal *Structure Plan* for an expanded 'Broader Western Sydney Employment Area' (BWSEA), as shown in **Figure 2**, would provide for changes in the land-use zoning and character of these additional lands to an industrial/employment focus consistent with that of the existing WSEA. BWSEA within the regional planning context is presented in **Figure 3**.



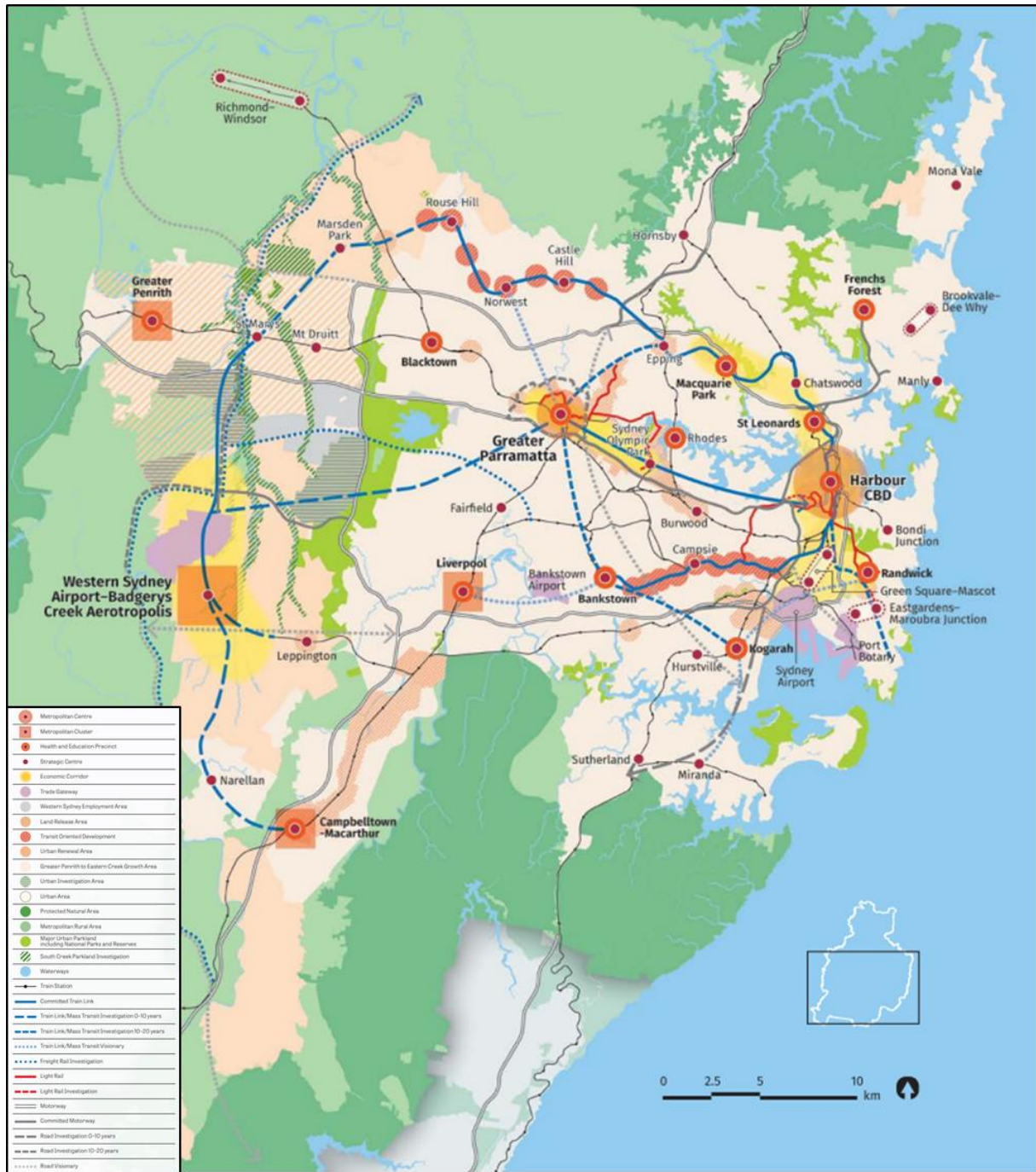
**Figure 1: Oakdale West Local Context**

Source: SBA Architects



**Figure 2: BWSEA Precinct Plan**

Source: GHD



**Figure 3: Oakdale Industrial Estate Regional Context**

Source: Greater Sydney Region Plan 2018

### 1.2.1 Oakdale Precincts

As mentioned, OWE is located within the broader Oakdale Industrial Estate, which consists of a number of smaller industrial zoned Estates. The current development stages of the Estates are detailed in **Table 1**. In addition to the broader Oakdale Industrial Estate, the lands to the immediate north of OWE (referred to as the Fitzpatrick Site) are also identified for future industrial development.

**Table 1: Oakdale Precincts**

Estate	Area	Planning Approvals	Stage of Development
Oakdale Central	61 ha	<p>Concept Plan Approval MP08_0065 (as modified) for employment park for warehousing, distribution and light industrial uses.</p> <p>Project Approval MP08_0066 (as modified) for DHL Logistics Hub consisting of 2 warehouses.</p> <p>Project Approval SSD 13_6078 (as modified) for the development at Lot 1C, Lot 2B and Lot 3.</p>	Infrastructure works complete, with the majority of warehouses completed and tenanted.
Oakdale South	117 ha	SSD application (ref. SSD_6917) lodged for Concept Proposal and Stage 1 development.	<p>Development approval granted.</p> <p>A number of warehouses completed and/or under construction.</p>
Oakdale West	154 ha	SSD application to be lodged for staged development.	Estimated development in three to five years, after project approval.
Oakdale East	88 ha	No current planning approvals.	<p>Still being used for quarrying activities.</p> <p>Estimated redevelopment in ten years, with some redevelopment forecast in the short-term (&lt; 5 years).</p>

### 1.3 Overview of Masterplan Development

The indicative Masterplan for OWE is shown in **Figure 4** and generally represents preliminary concepts that will be further refined throughout the design and planning process. In general, the SSD application seeks approval for the following:

- A Concept Proposal for the staged development of OWE including:
  - Development of a regional warehousing and distribution hub with 24 hours/day, 7 days/week operation;
  - Indicative site/lot layout, site access, internal road network, site levels, drainage, building envelopes, parking and landscaping;
  - Development controls; and
  - Biodiversity offsets.
- Civil works for OWE comprising of:
  - Site preparation and mobilisation including clearing of land;
  - Bulk and detail earthworks and support structures (batters and retaining walls);
  - Site stormwater management including construction of detention basins;
  - Construction of site access, estate roads and utility infrastructure and connection of services;
  - Landscaping and public domain works to estate roads, estate entrance and key nodes;
  - Land stabilisation and rehabilitation; and
  - Environmental protection and management measures.
- Stage 1 Precinct Development comprising of:
  - Staged construction of warehouse 1A, 1B and 1C;
  - On-lot stormwater, infrastructure and services;
  - Construction and fit out of buildings;
  - Construction of hardstand, loading and car parking;
  - Landscaping and signage; and
  - Use of warehouse 1A, 1B and 1C for generic 'warehousing and distribution' with 24/7 operation.
- Construction of the Western North-South Link Road (WNSLR) from OWE to Lenore Drive.



The remaining warehouses planned for OWE would be developed over an additional 4 stages and would be subject to separate assessment and approval in accordance with the controls established under this application.

The Masterplan is expected to yield 452,493m<sup>2</sup> of warehouse space and 22,776m<sup>2</sup> of associated office space across OWE, a land-use mix that is fully compliant with the intent of the WSEA.

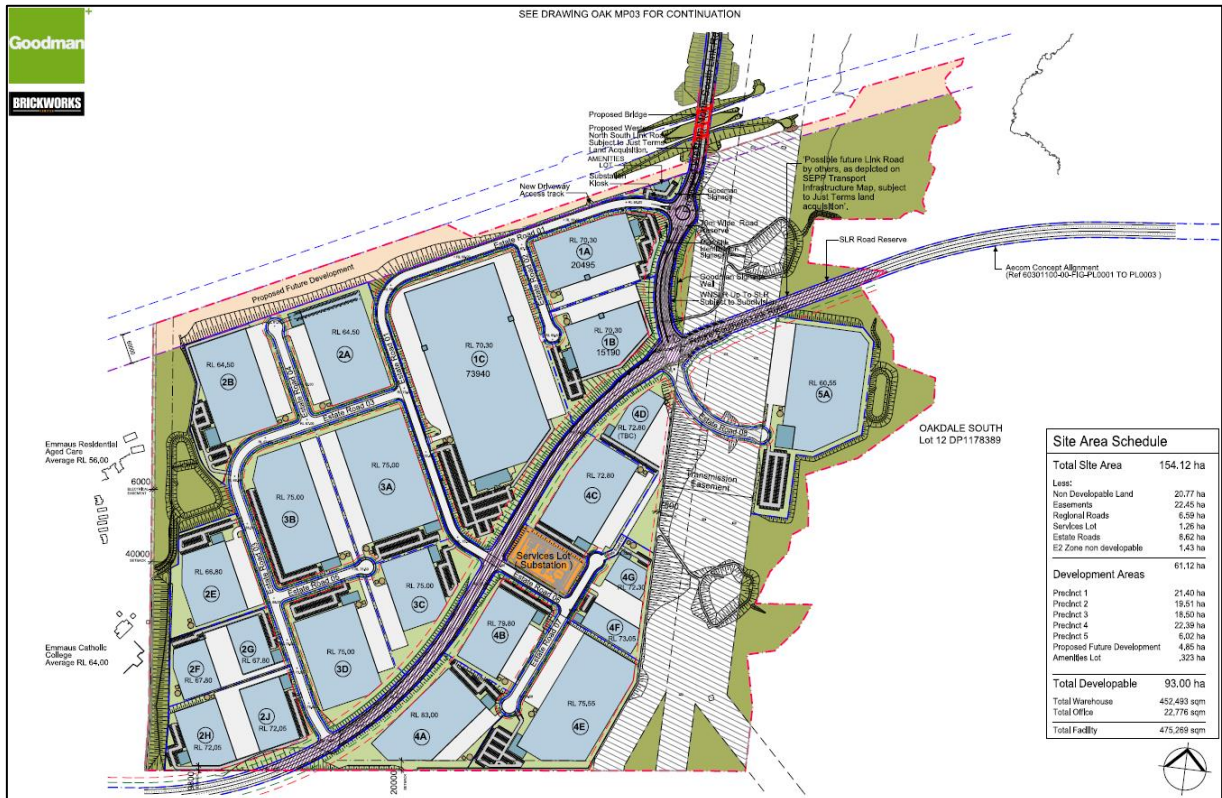


Figure 4: Proposed Masterplan Layout

## 1.4 Study Scope

This TIA report provides an assessment of the existing and future operation of the road network servicing OWE, the broader WSEA and other transport related issues including car parking requirements, vehicle access and public transport accessibility. The following key tasks have been performed in the preparation of this report:

- A review of the existing and proposed future road network providing access to the regional road network.
- A review of historic traffic assessments relating to the regional road network, and to the key roads providing access to the wider Estate and specifically OWE.
- An assessment of traffic generation characteristics of the proposed development and the results obtained from additional traffic modelling undertaken by GHD for the proposed WNSLR.
- An assessment of internal access and parking provisions.

In the preparation of this TIA report, reference has been made to the appropriate traffic and transport guidelines and assessment criteria, including:

- 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 utilises the most recent assessments of key infrastructure projects within the broader WSEA in providing an appropriate assessment of the relative impacts of the SSD. These assessments include:

- *Western Sydney Employment Area – Southern Link Road Network Strategic Transport Assessment*, prepared by AECOM, 18 April 2011 (SLRN Report)
- *Old Wallgrove Road Upgrade (Roberts Road - M7 Motorway) Traffic and Transport Report*, prepared by GHD, 30 April 2012 (OWR Upgrade Report)
- *Broader Western Sydney Employment Area – Transport Planning Preliminary Analysis, Exhibition Draft*, prepared by GHD, June 2013 (BWSEA Transport Report)
- *Old Wallgrove Road Extension Interim Network Testing*, prepared by GHD, 28 March 2014 (OWR Extension Report)
- *Broader WSEA SLRN – Options Refinement (2014)*, prepared by AECOM, 6 May 2014 (SLRN Options Report)
- *Erskine Park Traffic Modelling – Proposed Western North South Link Road*, prepared by GHD, May 2016 (WNSLR Report)
- *0129tn04v2 Western North South Link Road – Review of Intersection Design*, prepared by Ason Group, June 2018
- *0605I02v3 Memo-WNSLR Option Testing-Oakdale West Industrial Estate*, prepared by Ason Group, September 2018

The above studies have detailed the broader traffic environment in the vicinity of OWE, the road infrastructure upgrades required within the wider WSEA network by which the traffic generated by OWE and the broader area can be appropriately accommodated. These assessments have shown that the generation of the broader industrial area (including OWE) is supportable from a traffic and transport perspective further to the provision of the planned upgrades.

This is not to abrogate the need for a traffic and transport assessment of the SSD, as it is essential to confirm that OWE will not generate traffic demands above the levels assumed in the past assessments and to ensure that the proposed WNSLR will satisfactorily accommodate projected traffic volumes. As such, this TIA assesses the traffic generated by OWE and the impacts of the proposed arrangement of the WNSLR on the operation of existing and future intersections in the immediate vicinity of the site.



## 1.5 Secretary's Environmental Assessment Requirements

Secretary's Environmental Assessment Requirements (SEARs) were issued by the Department of Planning & Environment (DP&E) on 26 November 2015. These were subsequently revised in October 2017; a copy of which are included in **Appendix B**. The SEARs outline the key areas for consideration in any subsequent assessment, of which this report forms part of. This TIA seeks to address the traffic and transport issues raised in the SEARs report, of which, the key components are outlined below:

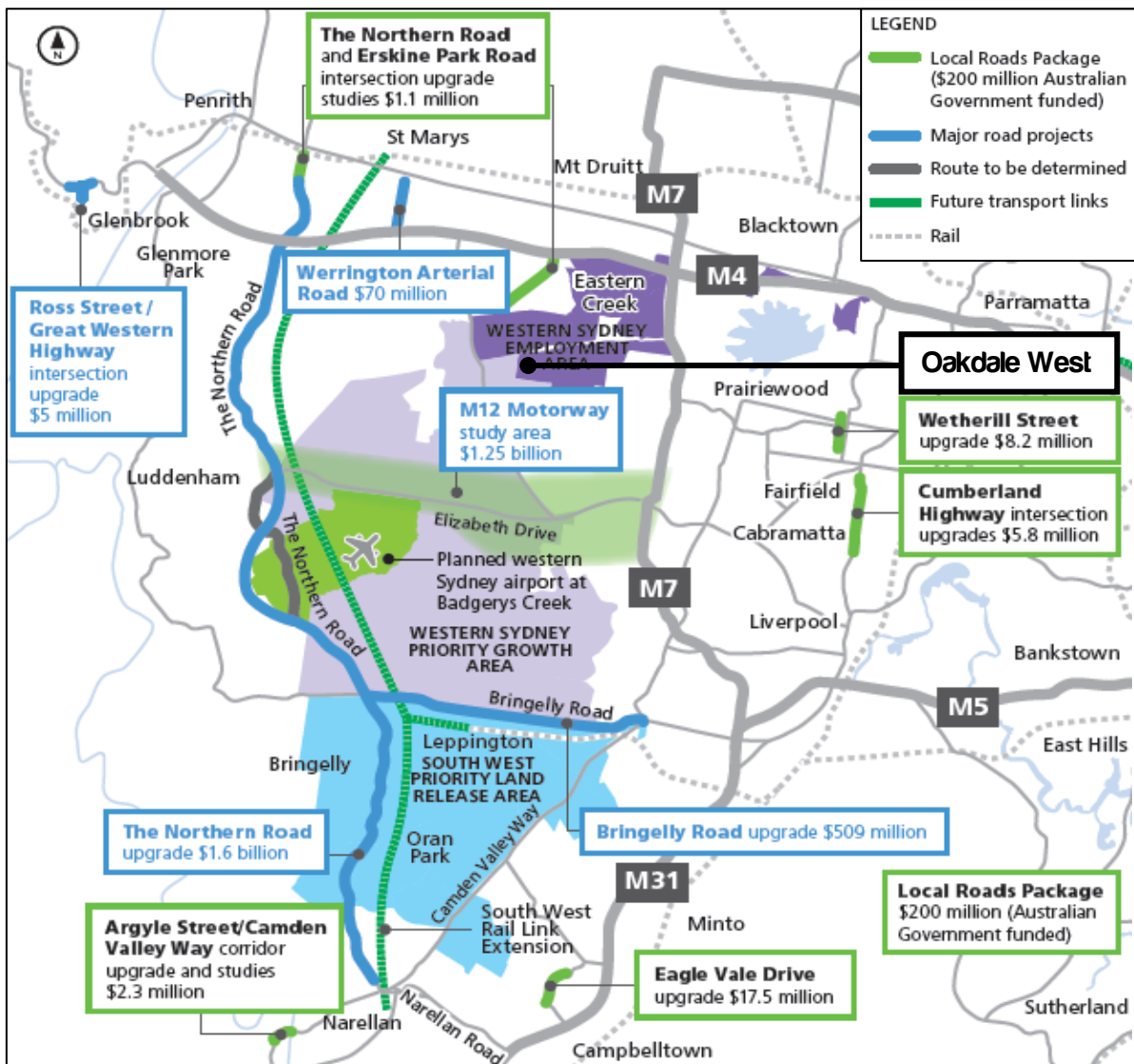
- Details of all traffic and transport types and volumes likely to be generated during construction and operation, including a description of haul routes.
- An assessment of predicted impacts of this traffic on the safety and the capacity of the surrounding road network, access points and modelling of key intersections, including Milner Drive and Old Wallgrove Road.
- Details of proposed site accesses, including detailed consideration of various access options, justification for the proposed location of the main access points and compliance with Australian Standards.
- Plans of any road upgrades or new roads required for the development.
- A discussion of any interactions between the proposed local internal roads and the preferred alignment for the Southern Link Road Network (as identified in the plan exhibited as part of the WSEA State Environmental Planning Policy (SEPP) amendment 2014) having regard to Clause 26 of the WSEA SEPP; and
- Detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian Standards.

This report responds to the above SEARs and other traffic and transport related issues resulting from the proposal.

## 2 Strategic Context

### 2.1 Western Sydney Growth Centres

The broader Oakdale Industrial Estate will provide employment generating land uses, as envisaged by the BWSEA, located within close proximity to a number of strategic developments, including the South West Growth Centre (SWGEC), North West Growth Centre (NWGC) and the proposed Western Sydney Airport (Badgerys Creek). To provide sufficient transport infrastructure for the aforementioned developments and BWSEA (in addition to the current infrastructure improvements within WSEA), a number of key infrastructure improvements are proposed or in progress within the *Western Sydney Infrastructure Plan* (WSIP), as shown in **Figure 5**.



**Figure 5: Western Sydney Infrastructure Plan**

Source: RMS

Based on **Figure 5** above, the regional road network upgrades are currently being planned or under construction with the objective to improve connectivity to southwest Sydney, the SWGC, the Western Sydney Airport and BWSEA. These upgrades will improve the road network capacity and support the movement of future employees and goods to/from the broader Oakdale Estate.

To support the future growth of WSEA, key planned upgrades to the Northern Road and Erskine Park Road and creation of the M12 Motorway are proposed to improve network capacity and connectivity to the M4 and the Western Sydney Airport, respectively.

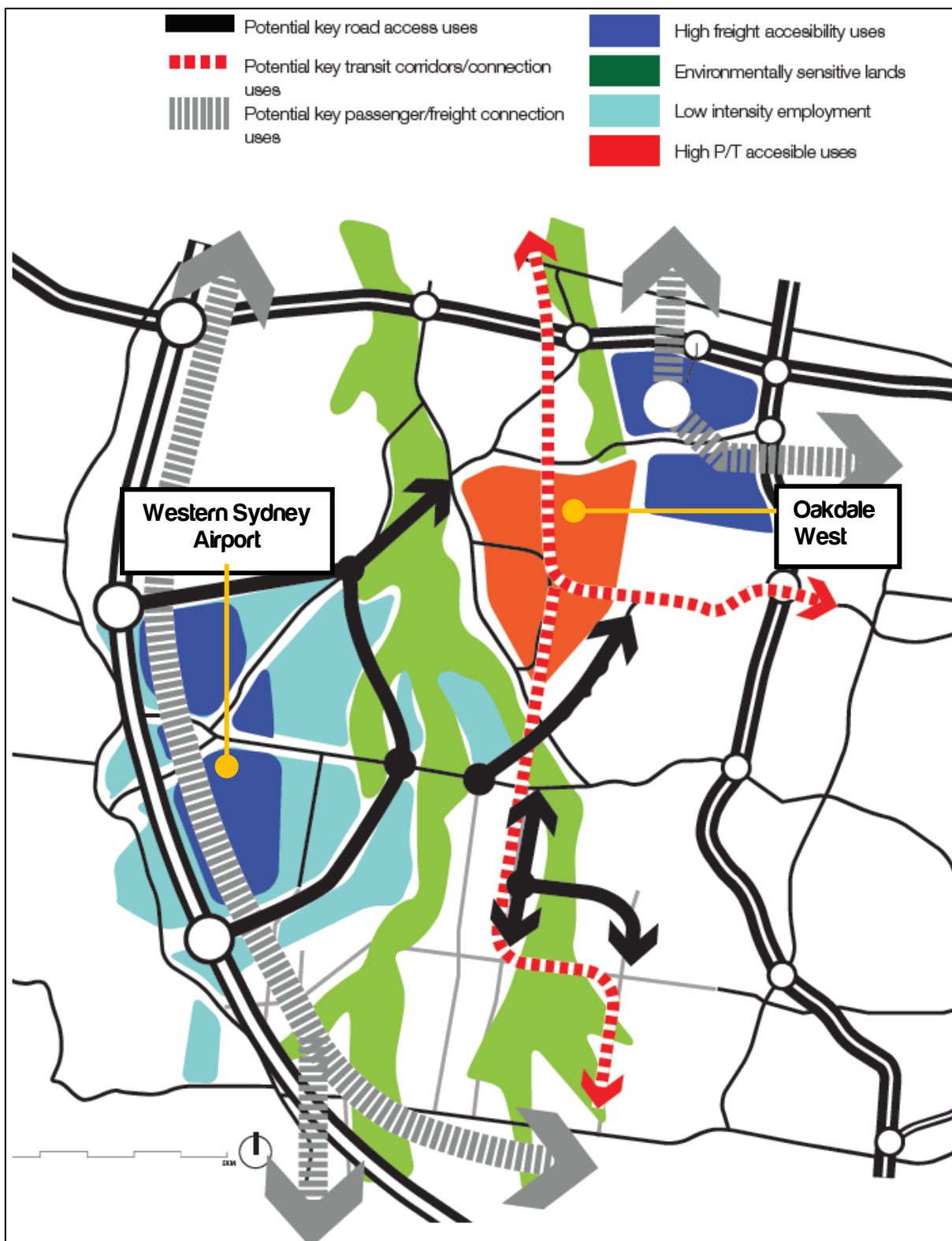
## 2.2 Broader Western Sydney Employment Area

The development of OWE is 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 Roads and Maritime Services (RMS) and the DP&E to ensure that suitable road network capacity is provided for the planned development within WSEA. This is evident through the numerous traffic and transport reports to develop supporting infrastructure for the region including the OWR Upgrade Report, the BWSEA Transport Report, the OWR Extension Report and the SLRN Options Report.

In addition to the continual development of BWSEA for industrial, warehousing and distribution purposes, planning is underway to enhance the transport infrastructure available to BWSEA through the proposed Western Sydney Airport. This is consistent with the overall access and connectivity plan for BWSEA, as shown in **Figure 6**.

The Western Sydney Airport will provide freight infrastructure to reduce the need to transport goods greater distances to existing air freight terminals such as Sydney Airport. Stage 1 of the Western Sydney Airport, is anticipated to be operating by 2025 and to be incrementally developed as demand increases over time. Forecasts indicate that there would be capacity for approximately 3,100 annual traffic movements for domestic freight and 3,900 annual traffic movements for international freight. The airport will provide alternatives to road freight, located in close proximity to developments within WSEA and the broader Oakdale Estate, befitting of a warehouse and logistics hub. This has benefits which include reducing freight costs, travel times, emissions and congestion on the wider road network.

As a response to the opportunities presented by the Western Sydney Airport, the DP&E is preparing a draft Land Use and Infrastructure Strategy, which investigates potential new land uses for employment, homes and services surrounding the airport. This includes the re-planning of WSEA to accommodate the airport and is anticipated to improve transport links to the airport.



**Figure 6: BWSEA Access and Connectivity Plan**

Source: GHD

## 3 Existing Conditions

### 3.1 Road Network

The existing and proposed road network in the vicinity of OWE is shown in **Figure 7** and key roads and intersections providing access for OWE are detailed below.

#### 3.1.1 M7 Motorway

The M7 motorway is a high capacity road link of state significance and was built to accommodate future traffic growth in the Western Sydney region. It provides a key north-south link, to the east of OWE, between the M2 motorway in the north and the M5 motorway to the south as part of the Sydney orbital road network. A major interchange between the M7 motorway and M4 Western motorway is located 2.5 km north of OWE, which connects the Sydney CBD and western Sydney suburbs. The motorway carries 4 trafficable lanes within a divided carriageway and is generally subject to a 100 km/h speed limit (within proximity of OWE). It carries approximately 70,000 vehicles per day(vpd).

#### 3.1.2 Wallgrove Road

Wallgrove Road is an arterial road that runs in a north-south direction to the east of OWE and parallel to the M7 motorway. The two-lane, two-way road provides a link between Elizabeth Drive in the south and the Great Western Highway in the north. Similar to the M7 motorway, Wallgrove Road connects to the M4 motorway approximately 2.5 kilometres to the north of OWE. The posted speed limit on the road within proximity of the site is 70 km/h and the road carries approximately 30,000 vpd.

#### 3.1.3 Lenore Drive

Lenore Drive is a recently upgraded sub-arterial route providing an east-west connection linking OWR to the east and Mamre Road to the west. It provides for four lanes along a divided carriageway with a shared path along the northern side of the road.



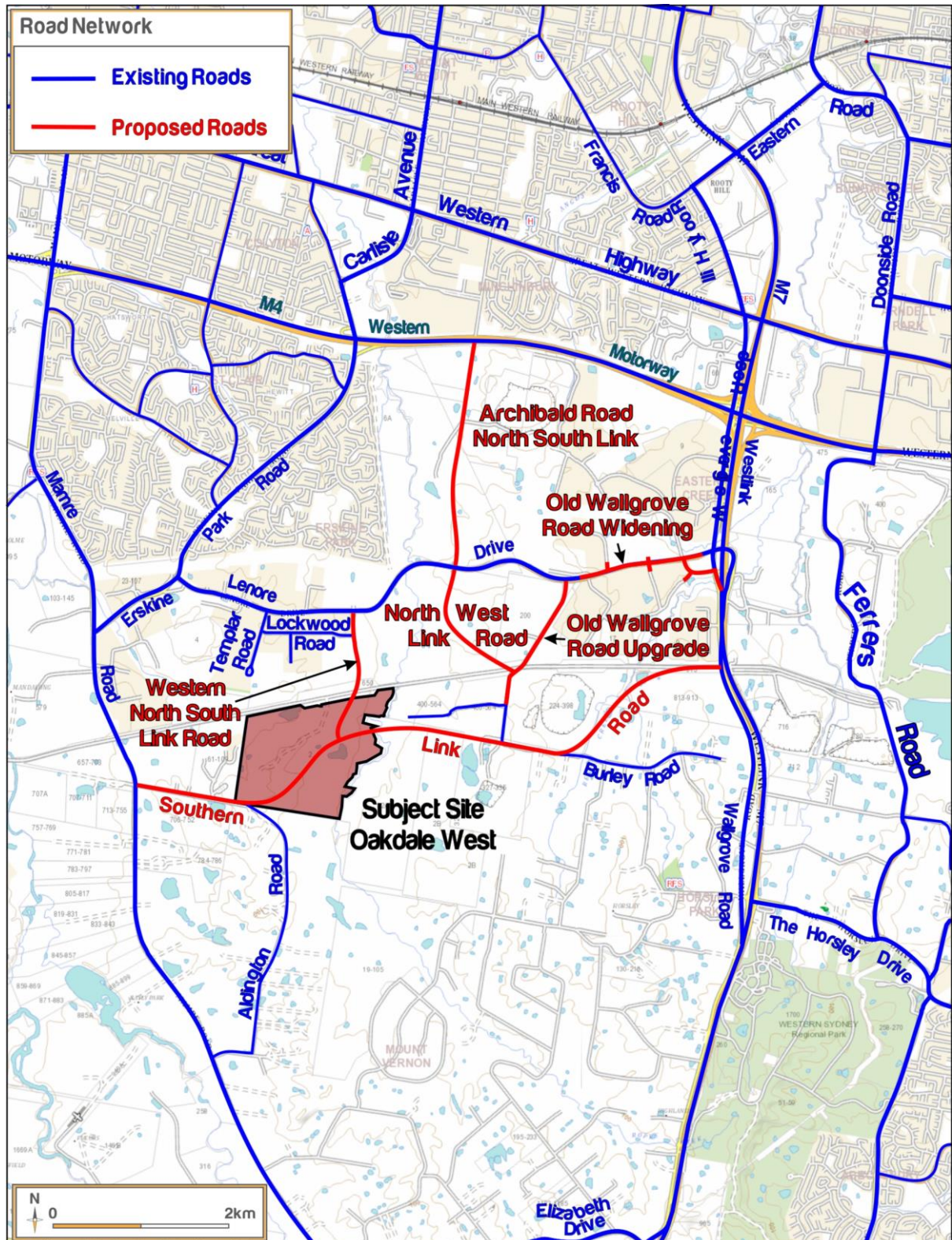


Figure 7: Existing and Proposed Road Network



### 3.1.4 Old Wallgrove Road

Old Wallgrove Road (OWR) forms part of an RMS Main Road (MR 629) route between Lenore Drive and Wallgrove Road. To the south of Lenore Drive, it functions as a local collector road and provides access to the Oakdale Central, Oakdale South and future Oakdale East Estates.

With reference to **Figure 7**, the section of OWR to the east of Lenore Drive has recently been upgraded to provide a sub-arterial link to an interchange with the M7, through the M7 Business Hub and the intersection of Roberts Road (see **Figure 8**).



**Figure 8: Old Wallgrove Road M7 to Roberts Road Upgrade**

Source: RMS

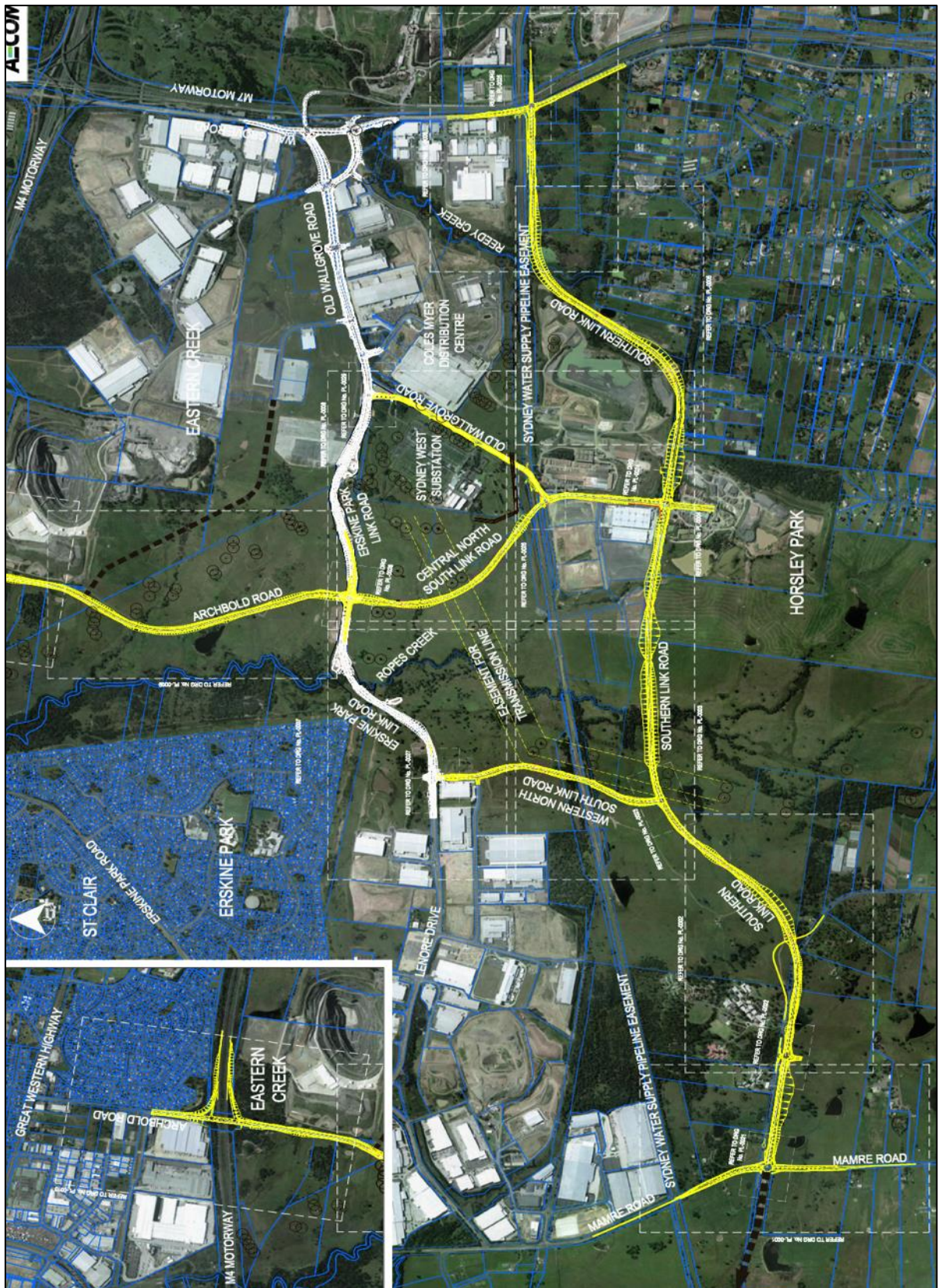
### 3.1.5 Southern Link Road Network

The Southern Link Road (SLR) network will provide additional road infrastructure to accommodate travel demand generated by employment areas within the South of Warragamba Pipeline area. An indicative route alignment for the proposed road network was initially identified in SEPP (WSEA) 2009 and has since been refined to the current alignment as shown in **Figure 9**, which comprises of:

- An east-west SLR generally running parallel to Lenore Drive between Mamre Road to the west and Wallgrove Road to the east. Traffic generated by the WSEA 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 to join an extension of Archbold Road. The proposed Archbold Road extension is to extend from Lenore Drive to the M4 Motorway, with the interchange between Archbold Road and the M4 Motorway. The extension is currently being progressed by the RMS and is expected to be delivered in 5-10 years and will provide improved accessibility to WSEA with access to the M4 Motorway being provided without the need to access either Wallgrove Road or the M7 Motorway thereby reducing future travel times across the network.
- The WNSLR is a proposed north-south link between Lenore Drive to the north and connecting to the SLR to the south. Until such time that the SLR is completed, the road will provide sole access route for OWE to the wider road network. An assessment of this road link is provided in Section 6 of this report.

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.





**Figure 9: Proposed Southern Link Road Network and Alignment**

Source: AECOM

## 3.2 Public Transport Services

### 3.2.1 Existing Bus Services

The existing bus services within the vicinity of the OWE are shown in **Figure 10** 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.

### 3.2.2 Bus Service Opportunities

There is substantial opportunity to provide improvements to public transport connectivity within 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<sup>1</sup>, 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.
- 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.
- in the long 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.



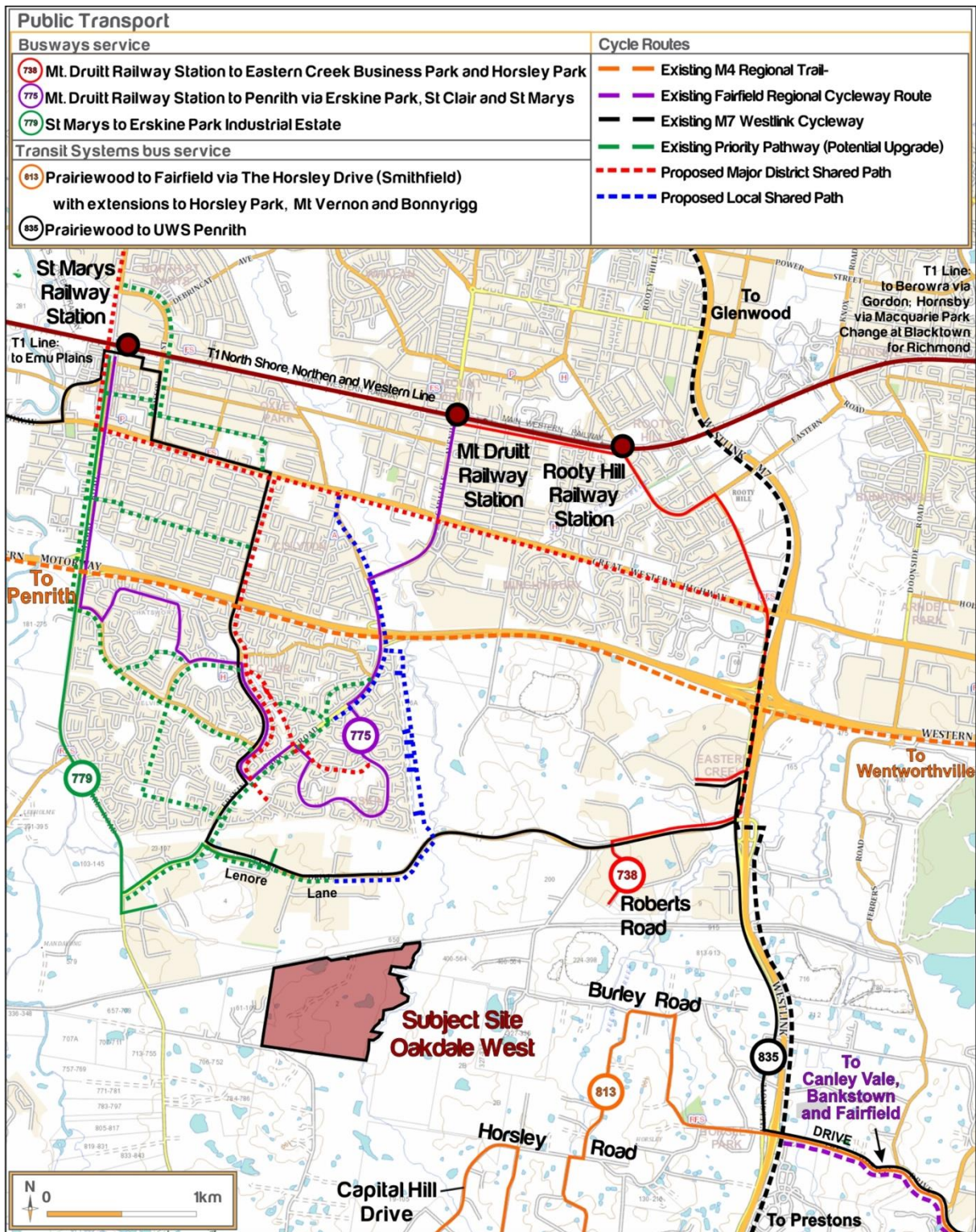


Figure 10: Existing Public Transport and Cycle Links

### 3.3 Cycling

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 as proposed as part of the SSD, will further encourage the use of the existing networks and will assist in the reduction of private vehicle travel for the journey to work.

## 4 Sub-Regional Traffic Assessments

A number of traffic and transport assessments have been prepared over the past decade examining the area of the WSEA and includes the traffic impacts of OWE. Of particular relevance to this TIA are the investigations of the following key roads and intersections:

- OWR, and its connection to Wallgrove Road and the M7
- Lenore Drive
- The SLR
- North-South connections between the SLR and OWR/Lenore Drive
- North-South connections between Lenore Drive & the M4 (specifically via Archbold Road)

A brief overview of the most recent and relevant assessments is provided below, focusing on the current determination of appropriate infrastructure in the area and of specific relevance to this TIA.

### 4.1 Old Wallgrove Road Upgrade: Traffic & Transport Report 2012

The OWR Upgrade Report provides a detailed assessment of the future traffic demands on the section of OWR between the M7 and Roberts Road and was the key reference document for current upgrade works being undertaken by the RMS.

The most relevant information (to this application) provided in the OWR Upgrade Report relates to the traffic generation rates that underpin the assessment and its findings for the whole of WSEA. In this regard, traffic generation the OWR Upgrade Report adopted the following traffic generation rates:

- Eastern Creek Precinct: 21 vehicle trips per hectare for two-hour peak period.
- Ropes Creek Precinct: 10 vehicle trips per hectare for two-hour peak period.
- Erskine Park Employment Area: 10 vehicle trips per hectare for two-hour peak period.
- Lands south of Sydney Water Pipeline: 21 vehicle trips per hectare for two-hour peak period.

**Table 2** (extracted from the OWR Upgrade Report) provides a summary of 2031 traffic generation forecasts. From the results of the detailed modelling of the regional road network, the report then provides recommendations for the upgrade of OWR between the M7 and Roberts Road, which is the basis of current RMS upgrade works as presented in **Figure 8**. It is noted that RMS has adopted these recommendations and works are largely completed.

**Table 2: Traffic Generation – 2031 AM (2 Hour Peak)**

Area	Developed Area (ha)	Percent of Total Area	2-hour AM Peak Vehicle Volumes		
			In	Out	Total
Eastern Creek	550	100%	9,240	2,310	11,550
Ropes Creek	173	100%	1,384	346	1,730
Erskine Park Employment Area	326	100%	2,608	652	3,260
Lands south of Pipeline	507	100%	8,518	2,129	10,647
<b>Total</b>	<b>1,556</b>	<b>100%</b>	<b>21,750</b>	<b>5,437</b>	<b>27,187</b>

Source: GHD (April 2012)

This assessment underpinned the overall suite of improvements to OWR discussed in Section 3.1.4 above with the resulting intersection designs shown in Figure 8.

Building upon OWR Upgrade Report, the OWR Extension Report provides an updated assessment of OWR and its extension to the future SLR. This report included modelling and revised arrangements for the intersections at OWR with Lenore Drive and Archbold Road with Lenore Drive with the relevant modelling results summarised in Section 4.3.

## 4.2 Broader WSEA SLRN – Options Refinement

The most recent assessment of the preferred route options and alignment of the SLR was completed by Aecom in 2014 and documented in the SLRN Options Report. The refined alignment and access arrangements proposed in the report was supported by modelling undertaken by GHD. The report made the following key findings / recommendations:

- No direct connection between the M7 and the SLR is proposed. All eastern access to the SLR will be via an upgraded Wallgrove Road Interchange.
- Access to OWR is considered beneficial and that this should be extended to join with the Archbold Road extension.
- All future intersections are to operate at an acceptable Level of Service ('D' or better) under the 2036 design year assuming full development of the WSEA (results presented in Section 4.3).

It is noted that SIDRA modelling outputs a range of performance measures, in particular:

- *Average Vehicle Delay (AVD)* – The AVD (or average delay per vehicle in seconds) for intersections also provides a measure of the operational performance of an intersection and is used to determine an intersection's Level of Service (see below). For signalised intersections, the AVD reported relates to the average of all vehicle movements through the intersection. For priority (Give Way, Stop & Roundabout controlled) intersections, the AVD reported is that for the movement with the highest AVD.
- *Level of Service (LOS)* – This is a comparative measure that provides an indication of the operating performance, based on AVD.

The following table provides a recommended baseline for assessment as per the RMS Guide:

**Table 1: RMS Level of Service Summary**

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.



### 4.3 Future Road Network Operation

The operation of the future road network, including the connections of the SLR were assessed and the results presented in the OWR Extension Report and in the SLRN Options Report. Key findings of the two reports are provided in **Table 4**. The location of the mentioned intersections is shown in **Figure 12**.

**Table 4: Future Intersection Performance\***

Intersection	Period	Design Year 2031-2036	
		Average Delay (sec)	Level of Service
1 (EPLR   Eastern NS SLRN Connection)	AM	37.3	C
	PM	52.7	D
2 (EPLR   Old Wallgrove Road)	AM	18.0	B
	PM	27.3	B
3 (Eastern NS SLRN Connection   Old Wallgrove Road)	AM	29.2	C
	PM	33.5	C
4 (EW SLRN Connection   Eastern NS SLRN Connection)	AM	38.1	C
	PM	52.9	D
5 (SLRN   Mamre Road)	AM	46.0	D
	PM	48.6	D
6 (EPLR   Western NS SLRN Connection)	AM	21.3	B
	PM	31.1	C
7 (EW SLRN Connection   Western NS SLRN Connection)	AM	32.0	C
	PM	26.9	B
8 (SLRN   Wallgrove Road)	AM	55.5	D
	PM	55.6	D

\* Source: OWR Extension Report – 2031 Design Year, GHD 2012 & SLRN Options Report – 2036 Design Year, AECOM 2013

The above results demonstrate that the current and planned network will result in the satisfactory operation of all key intersections assessed in the previous traffic reports.



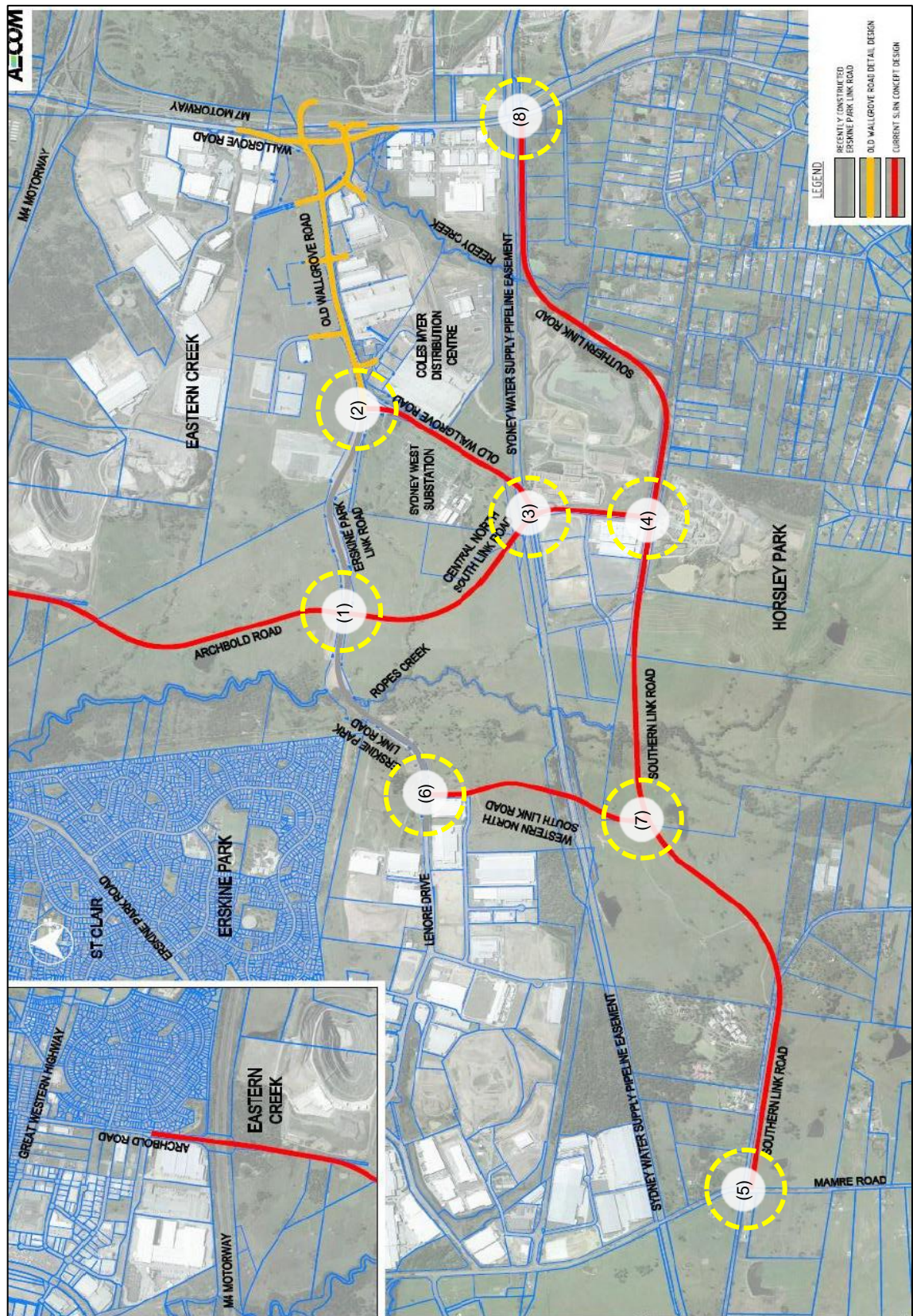


Figure 11: Future Intersection Performance Summary

## 5 Precinct Access

### 5.1 Western North South Link Road

As discussed in Section 3.1.5, the SEPP (WSEA) 2009 has identified a north-south connection, known as the WNSLR, between Lenore Drive and the SLR as part of the overall SLR network. In this regard, the SSD application seeks to construct the WNSLR to provide for the following:

- Vehicular access for OWE and future industrial developments at the Fitzpatrick site to the regional road network.
- Infrastructure contributions to the planned WSEA road network, providing a key north-south connection from the SLR, once constructed.
- Sufficient mid-block and intersection capacity to accommodate future development within the BWSEA, including staged development for 2026 and 2036 scenarios.

The WNSLR will run through the eastern portion of OWE and until such time the SLR is completed, all access to and from OWE will be provided from this road. The proposed alignment of the road is presented in **Figure 12** and its alignment through OWE, shown previously in Figure 4, is generally consistent with that planned by the DP&E. The WNSLR will form major intersections with Lenore Drive, the SLR and minor intersections with Lockwood Drive and Estate Road 01.

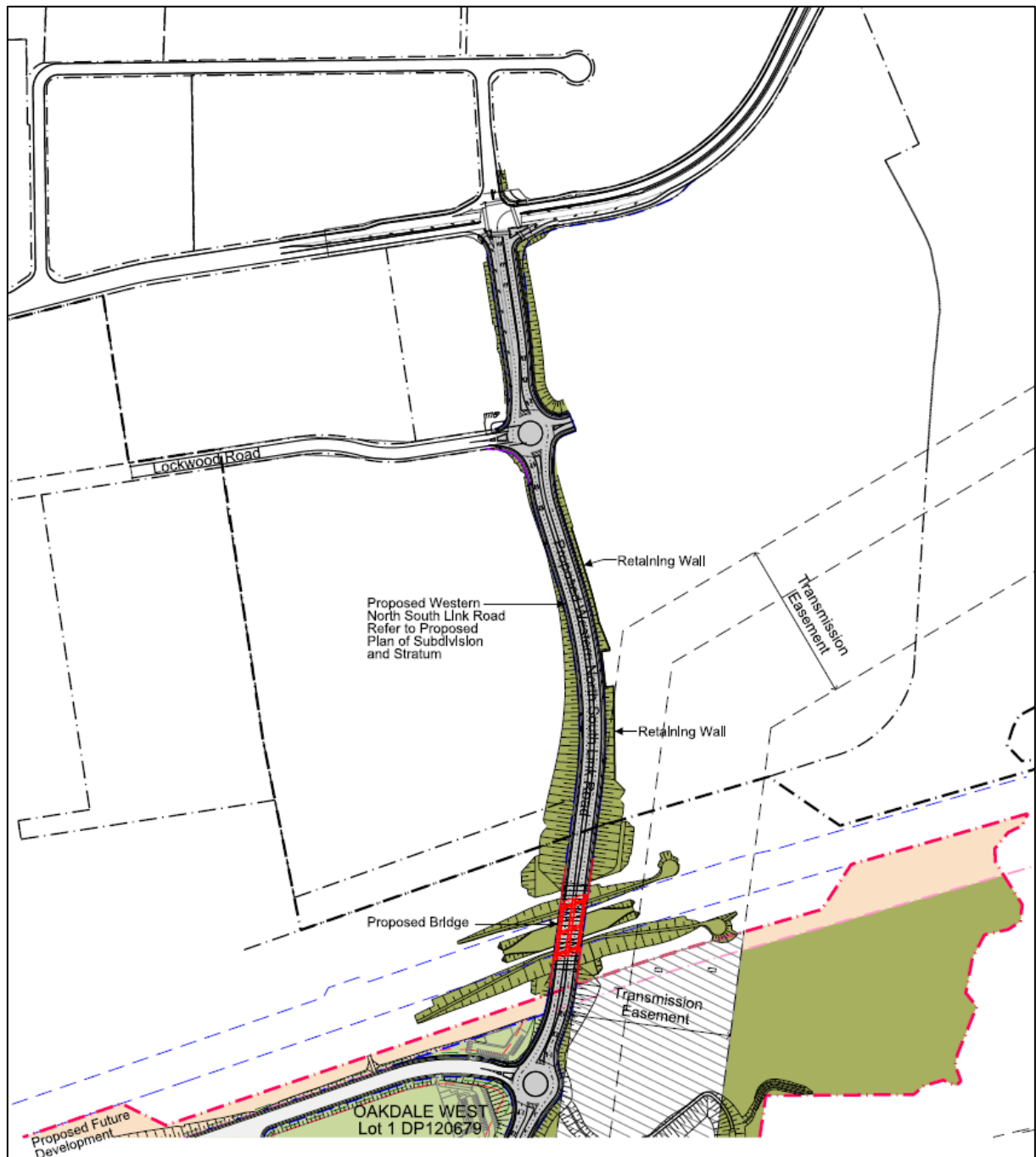
#### 5.1.1 Proposed Intersection Arrangements

The proposed intersections along the WNSLR are summarised as follow:

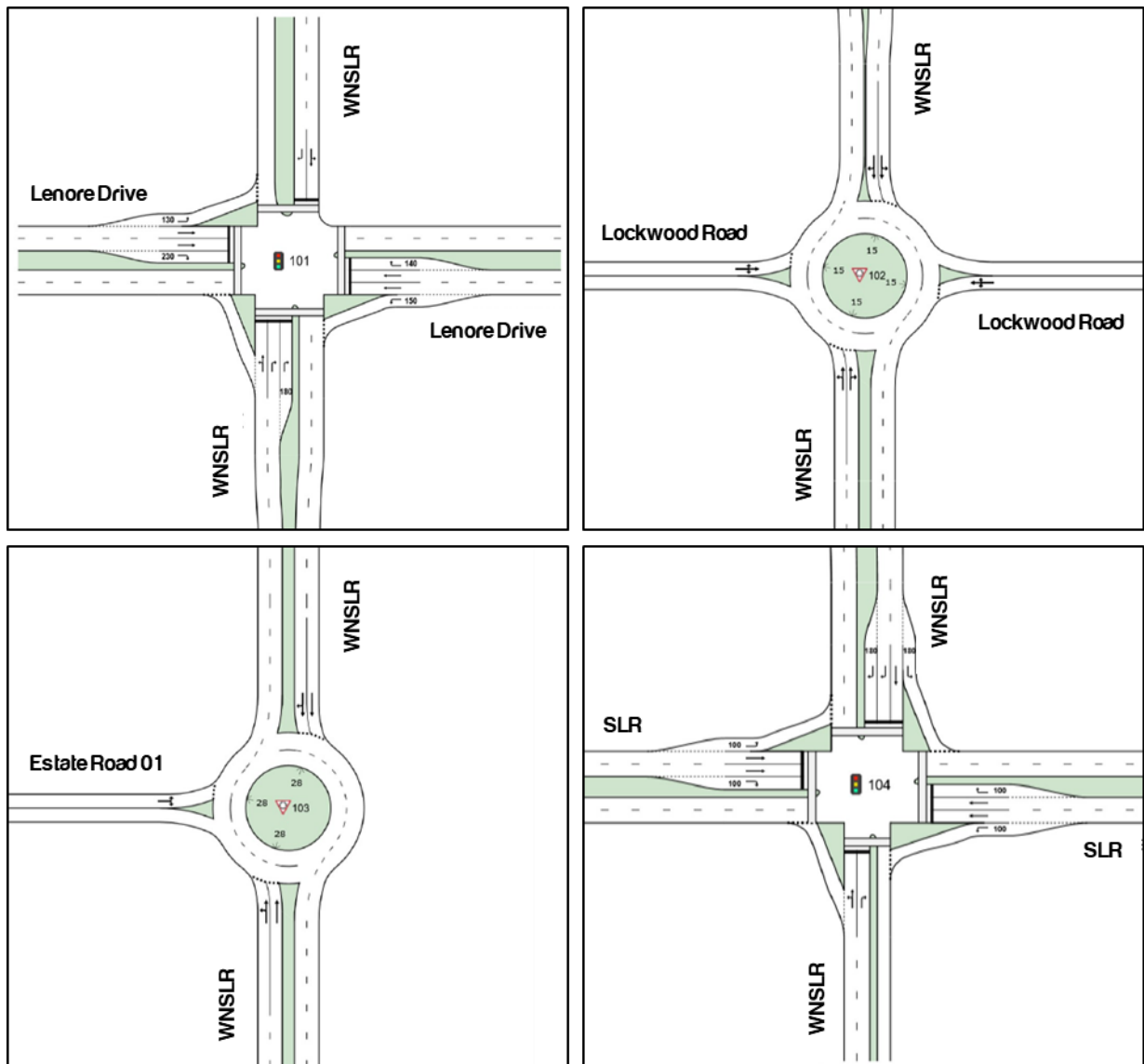
- A 4-leg intersection with Lenore Drive, providing access to the regional road network and a local connection to an extended Grady Crescent to accommodate future industrial development to the north.
- A 4-leg roundabout with Lockwood Road (previously proposed as a signalised intersection), providing 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.
- A 3-leg roundabout with Estate Road 01, providing primary access to OWE. This 'intersection' will be the sole access provided to Precincts 1 - 4 until the completion of the SLR.
- A 4-leg intersection with the SLR, completing the north-south connection between Lenore Drive and SLR. The intersection will also provide access to Precinct 5 of OWE via Estate Road 7 to the south of the intersection. It is expected that the intersection would be delivered by RMS, as part of the SLR works, however an interim road connection to Precinct 5 could be provided – as part of a future DA for Precinct 5 - in the nearer term.



The proposed concept intersection layouts are provided in **Figure 13**.



**Figure 12: Western North South Link Road**



**Figure 13: WNSLR Proposed Intersection Arrangement Concepts**

## 5.2 Southern Link Road

The OWE will make an allowance for the future SLR as per the concept alignment identified within the SLRN Options Report. However, it is noted that the design and construction of SLR is being undertaken by RMS and has not yet been finalised. Notwithstanding, as stated in the SLRN Options Report, the preferred strategic alignment of the western section of the SLRN (including the section passing through OWE) is generally accepted by key stakeholders and provides a well-balanced solution compared to alternatives.

With reference to the Masterplan (Figure 4 previously), a number of connections to the SLR are proposed to provide access to the relevant precincts within OWE. The following access arrangements are proposed:

- Eastbound left-in/left-out to/from Estate Road 01 and Estate Road 03, serving Precincts 1-3,
- Westbound left-in/left-out to/from Estate Road 06, serving Precinct 4; and
- A new approach of Estate Road 08 to form a 4-leg intersection with the SLR.

It is noted that these access provisions are subject to the completion of the SLR.

### 5.3 Site Layout & Road Design

The following key dimensions are proposed for the various roads included within the OWE:

- |                |                         |                                  |
|----------------|-------------------------|----------------------------------|
| ▪ Estate Roads | 23 metre road reserve   | (15.5 metre carriageway)         |
| ▪ WNSLR        | 34.6 metre road reserve | (24.6 metre divided carriageway) |
| ▪ SLR          | 30.9 metre road reserve | (21.9 metre carriageway)         |

All roadways and associated intersections have been designed to accommodate the maximum sized vehicles (B-double trucks) requiring access. Reference should be made to the civil works plans prepared separately by AT&L.

The proposed access driveways to individual warehouse buildings have been designed in accordance with the relevant requirements of AS 2890.1 and AS 2890.2 and are considered supportable. It is however noted that the future access provisions will be considered in detail in the subsequent Development Application (DA) stages and it would be expected that relevant Conditions of Consent requiring compliance with the Australian Standards be included in any approval of this SSDA.

## 6 Traffic Impact Assessment

### 6.1 Background and Scope

GHD were commissioned by Goodman Pty Ltd to undertake a traffic modelling study to assess the future performance of the proposed WNSLR with the full development of both the Fitzpatrick site and OWE. This modelling builds upon previous work undertaken for the DP&E in the development of the BWSEA Structure Plan and previous assessments of key road infrastructure such as the OWR upgrades, the OWR extension and the SLR. The traffic models for these previous assessments were developed in consultation with the DP&E and RMS.

Having regard for the above, an Aimsun model was developed by GHD to forecast traffic volumes within the locality for 2026 and 2036 scenarios. This model relies upon the previous assumptions and parameters, including the completion of the SLR and background traffic volumes, used in the aforementioned traffic assessments undertaken on behalf of the DP&E and RMS. The forecast traffic volumes were extracted and translated into SIDRA intersection models to assess the operation of the proposed intersection arrangements. The findings of the modelling study are documented in the WNSLR Report.

The key findings of the WNSLR Report are summarised in the sections below.

### 6.2 Traffic Generation

The traffic generation rates adopted for the modelling study is consistent with that used in all previous assessments for BWSEA, which are:

- 10 vehicles per 2 hours per developable hectare for the Fitzpatrick Site, and
- 21 vehicles per 2 hours per developable hectare for OWE.

The resultant development traffic for both 2026 and 2036 scenarios of the sites above are as follows:

- Fitzpatrick Site: 851 vehicles per 2 hours (approximately 426 vehicles per hour)
- Oakdale West: 1,884 vehicles per 2 hours (approximately 942 vehicles per hour)

It is noted that the adopted traffic generation rates above were developed without prior knowledge of the indicative gross floor areas for the above sites. Recognising that information of an indicative yield of OWE is now available, the adopted traffic generation rates should be confirmed against the most recent traffic generation rates published in the RMS Guide Update to ensure consistency with the survey findings.

The RMS Guide Update provides two industrial traffic generation rates based on surveyed industrial premises in within the Erskine Park Industrial Precinct, which are as follows:

- 1.892 vehicles per day per 100m<sup>2</sup> of industrial GFA (including ancillary office floor space).
- 0.163 peak vehicles per hour per 100m<sup>2</sup> of industrial GFA.

Application of the above rates to the proposed Masterplan GFA is provided in **Table 3**. It is noted that the floor areas for Precincts 2, 3, 4 & 5 have been estimated having regard for the current indicative development schemes. The floor areas for Precinct 1 are based on the actual proposed floor areas included in the Stage 1 DA discussed further below.

**Table 3: Oakdale West Traffic Generation**

Precinct	Total GFA (m <sup>2</sup> )	Peak Traffic Volumes (veh/hr)	Daily Traffic Volumes (veh/day)
1	116,359	190	2,202
2	105,425	172	1,995
3	99,967	163	1,891
4	120,988	197	2,289
5	32,530	53	615
<b>Total</b>	<b>475,269</b>	<b>775</b>	<b>8,992</b>

It is evident from the table above that OWE would generate traffic volumes in the order of 775 veh/hr during the peak and 8,992 vehicles per day at full development of the proposed Masterplan.

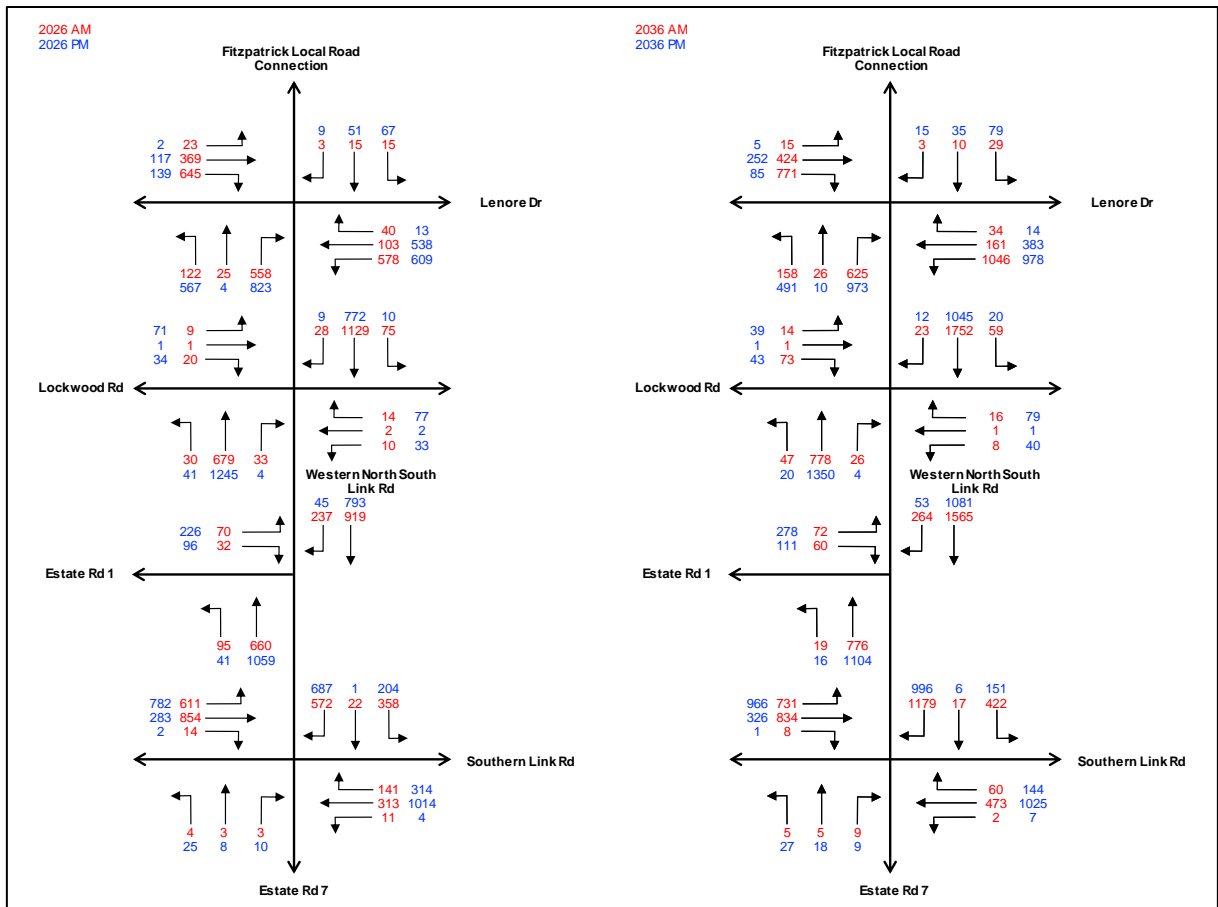
The results demonstrate that forecast peak traffic using the RMS Guide Update traffic generation rates are less than that adopted by the WNSLR Modelling Report. As such, the findings of the WNSLR Modelling Report would be considered a conservative or 'worst case' assessment.

Furthermore, the traffic generation assumed for OWE and the Fitzpatrick site within the WNSLR Modelling Report is commensurate to that assumed in previous assessments (as discussed in Section 4) undertaken for the infrastructure upgrades at OWR as well as the planned upgrades to deliver the SLR network. There is also evidence, as demonstrated by the surveys published in the RMS Guide Update, that the traffic generation for OWE could be lower than that assumed in the WNSLR Modelling Report. As such, the findings of the previous assessments remain valid.

## 6.3 Future Traffic Volumes

### 6.3.1 Future Year Traffic

Based on the same traffic distribution and traffic generation assumptions adopted in the modelling undertaken for the BWSEA Structure Plan, the forecasted peak traffic volumes for 2026 and 2036 are presented **Figure 14**.



**Figure 14: Forecasted 2026 (left) and 2036 (right) WNSLR Traffic Volumes**

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

### 6.3.2 Interim Traffic Volumes

Prior to delivery of the SLR, all access to OWE shall be via the proposed WNSLR connection to Lenore Drive. The forecasted traffic volumes on the internal OWE road network under this interim scenario is summarised in **Figure 15** and **Figure 16**. It is noted that the traffic volumes are based on the RMS Guide Update rates outlined in Table 3 and represents an interim scenario, assuming full development of OWE with all access from the WNSLR, prior to completion of the SLR.



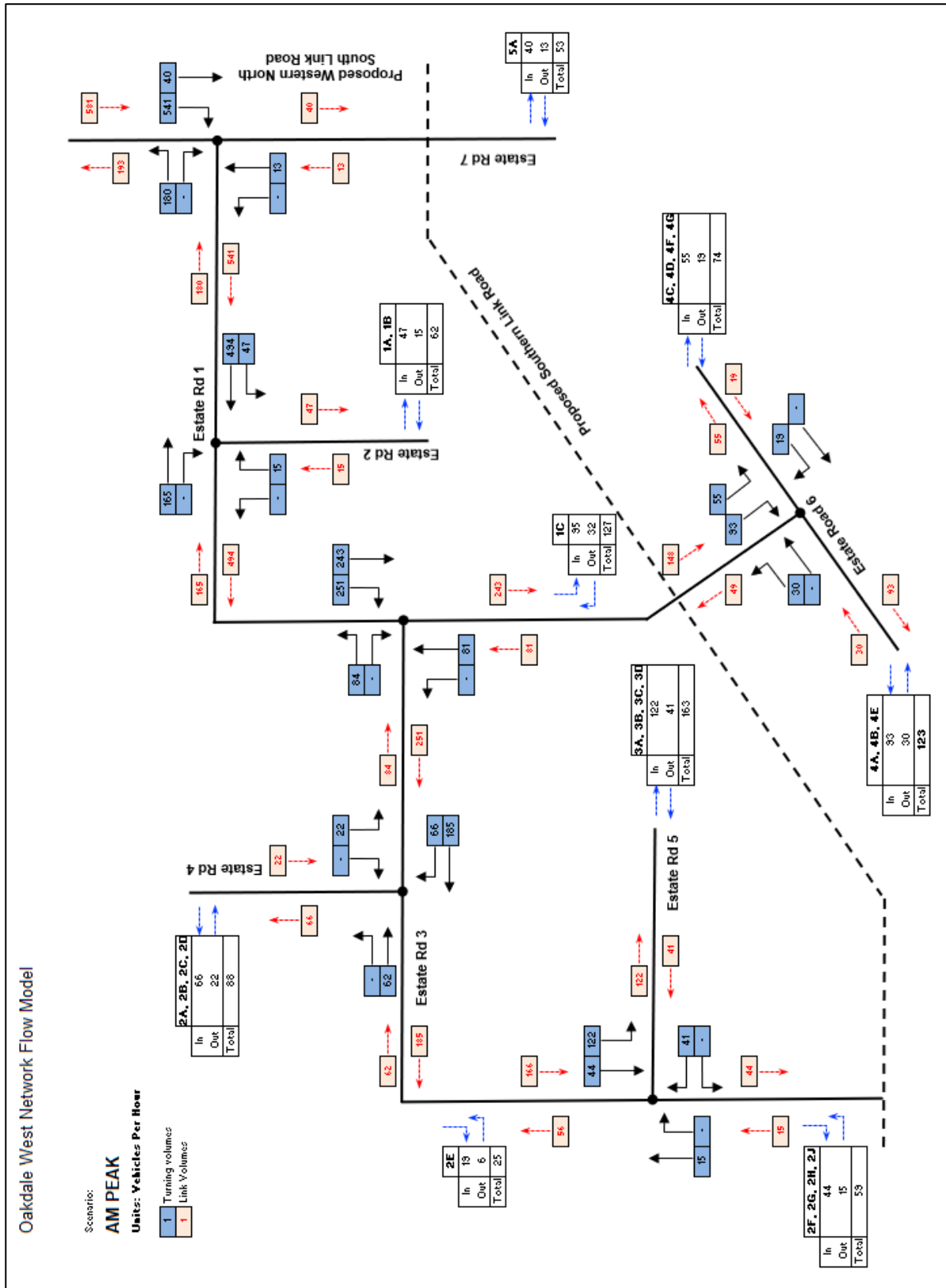


Figure 15: Interim AM Peak Traffic Volumes (Full Development of OWE, No SLR)

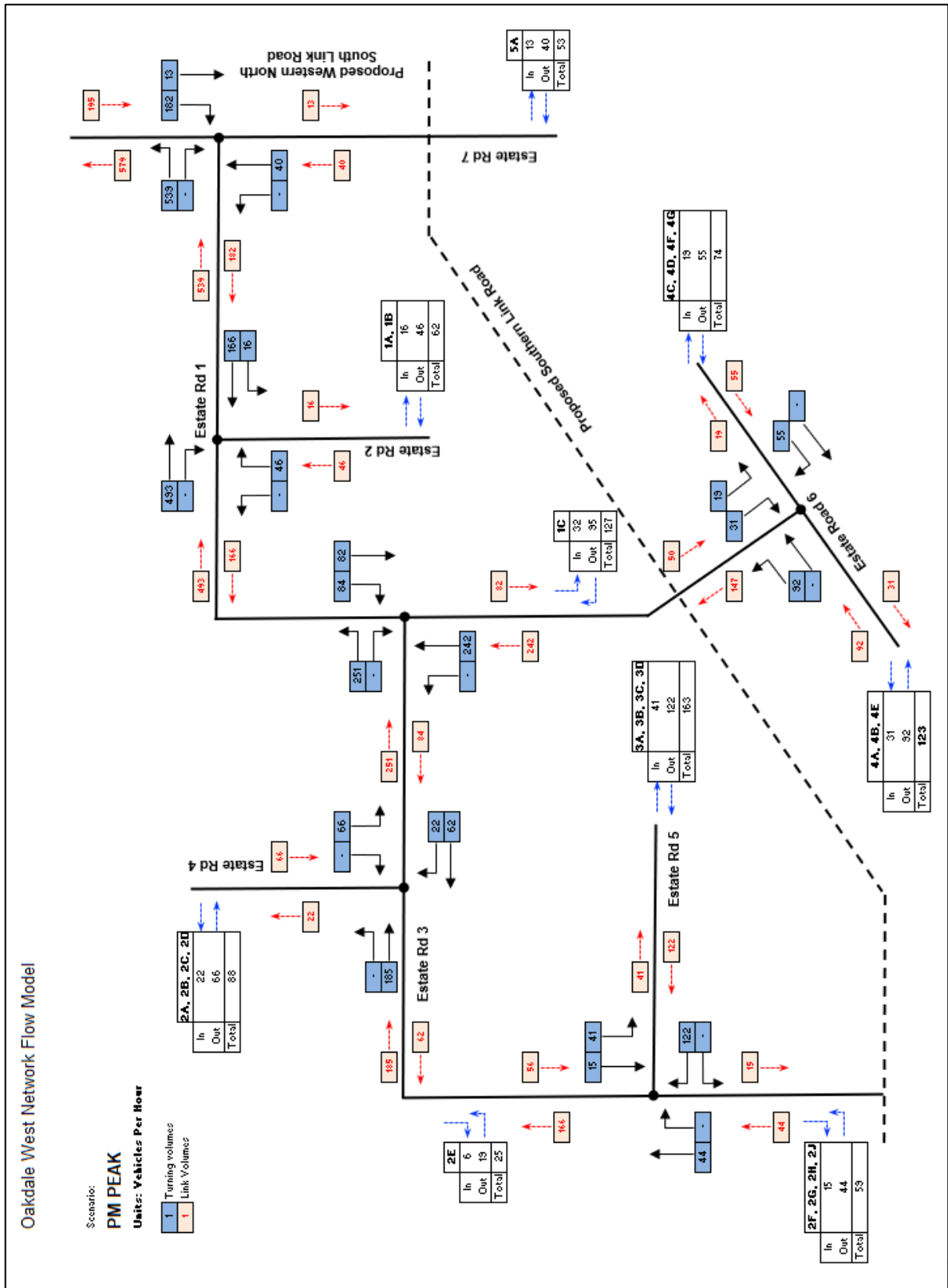


Figure 16: Interim PM Peak Traffic Volumes (Full Development of OWE, No SLR)

## 6.4 Future Intersection Operation

### 6.4.1 External Road Network

#### 6.4.1.1 GHD SIDRA modelling

GHD SIDRA intersection modelling results for the intersections along WNSLR are summarised as below:

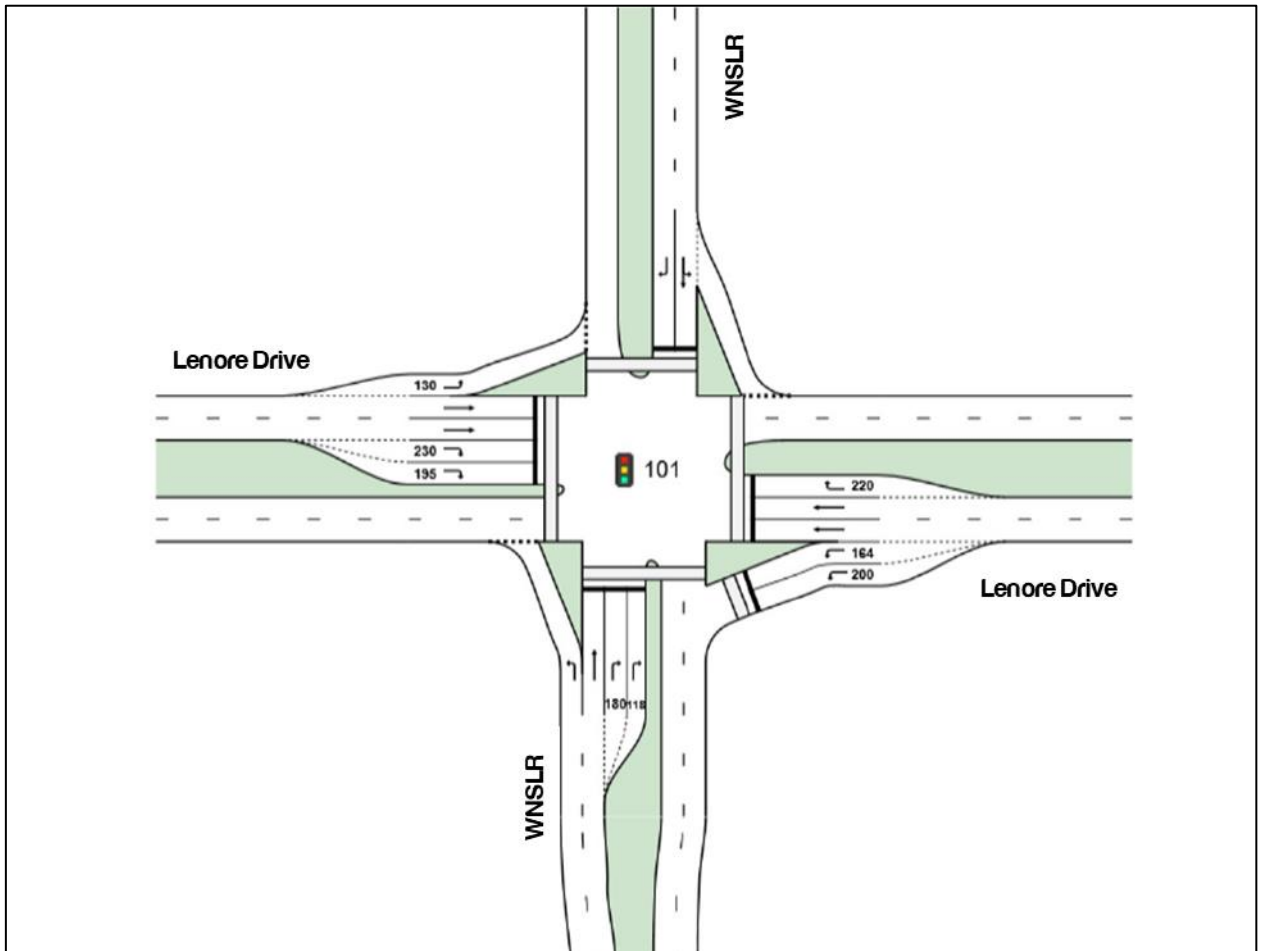
- All intersections would operate at LOS 'C' or better during both peak periods in 2026, with satisfactory delays experienced by passing vehicles.
- Under 2036 scenario, the delays are acceptable for all intersections, with the exception of the WNSLR / Lenore Drive intersection during the morning peak. This is discussed further below. All other intersections operate at a LOS of C or better during both peak periods.

It is noted that these assessments were undertaken based on previously proposed intersection layouts, when all intersections were proposed as signalised intersections. Detailed results are included in **Appendix C**.

#### 6.4.1.2 2036 Intersection Capacity Improvements

The GHD SIDRA modelling indicates that the WNSLR / Lenore Drive intersection would experience unacceptable delays – operating with a LOS F - during the 2036 morning peak period. It is noted that, as discussed in Section 6.2, this modelling adopts conservatively high traffic volumes for the development areas included and therefore it is questionable whether future traffic volumes will reach these levels by 2036.

Nevertheless, there is additional scope to upgrade this intersection by 2036, should this be deemed necessary by RMS at some point in the future. The potential intersection layout is presented in **Figure 17**.



**Figure 17: WNSLR / Lenore Drive – Potential 2036 Upgraded Intersection**

The upgraded intersection was reassessed using SIDRA modelling and the results are discussed in the following section.

It is emphasised that these works are not proposed under this application and are generally attributed to additional background traffic growth to 2036. Notwithstanding, sufficient space has been provided at this intersection to accommodate the additional turning lanes necessary (as documented in the engineering drawings submitted by AT&L) should these forecast traffic volumes be realised and improvement works be required at some point in the future.

#### 6.4.1.3 Updated SIDRA modelling

Due to the changes of the intersection control at the intersection of WNSLR with Lockwood Road and Estate Road 01 since the original submission, Ason Group has undertaken further SIDRA intersection modelling for peak 2026 and 2036 scenarios based on:

- Forecasted peak traffic volumes for 2026 and 2036 determined by GHD using an Aimsun traffic model (as shown in Figure 14), and
- Updated concept intersection layouts (as provided in Figure 13 and Figure 17).

It is noted that the GHD volumes are conservatively higher than currently forecast; based on the revised project yield. Notwithstanding, the GHD volumes are adopted for the purposes of a conservative assessment. A summary of the SIDRA intersection modelling results for peak 2026 and 2036 scenarios are summarised in **Table 4** and **Table 5**, respectively.

**Table 4: 2026 Intersection Performance**

Intersection	Control	Period	Average Vehicle Delay (AVD)	Level of Service (LOS)
WNSLR / Lenore Drive	Signal	AM	40.3	C
		PM	31.7	C
WNSLR / Lockwood Road	Roundabout	AM	13.1	A
		PM	14.8	B
WNSLR / Estate Road 1	Roundabout	AM	12.0	A
		PM	15.1	B
WNSLR / SLR	Signal	AM	30.3	C
		PM	35.9	C

**Table 5: 2036 Intersection Performance**

Intersection	Control	Period	Average Vehicle Delay (AVD)	Level of Service (LOS)
WNSLR / Lenore Drive	Signal	AM	37.9	C
		PM	26.9	B
WNSLR / Lockwood Road	Roundabout	AM	17.9	B
		PM	15.1	B
WNSLR / Estate Road 1	Roundabout	AM	12.5	A
		PM	17.7	B
WNSLR / SLR	Signal	AM	40.3	C
		PM	40.8	C



Table 4 and Table 5 demonstrate that the performance of all intersections would operate at LOS 'C' or better during both peak periods in 2026 and 2036, with satisfactory delays experienced by passing vehicles.

Upon request, an electronic copy of relevant SIDRA files can be provided to RMS and Council separately.

#### 6.4.2 Interim Access Arrangements

Interim access to OWE will be provided via the WNSLR, prior to completion of the SLR.

Based on the anticipated traffic volumes detailed in Section 6.3.2, traffic volumes arriving / departing to the north along WNSLR will be less than adopted for the future 2026 scenario. Accordingly, additional modelling of the interim access arrangements is not considered necessary. This assumes the intersection of WNSLR / Lenore Drive will be constructed in its final 2026 form prior to the opening of the WNSLR.

In the event that an interim intersection design is to be pursued, then this would be subject to a separate Traffic Management Plan (TMP), with an appropriate design developed accordingly.

## 6.5 Operational Traffic Summary

The OWE is expected to generate in the order of 775 vehicles per hour during peak periods, with the Oakdale West and Fitzpatrick sites generating a cumulative of some 1,368 vehicles per hour upon full development. This conservatively assumes that peak hourly volumes are 50% of the 2-hour volumes of (2,735 vehicles per 2 hours) adopted by the GHD modelling, with 15% of these vehicles expected to be commercial vehicle movements.

Planned road infrastructure in the vicinity of the site including the SLR and WNSLR will accommodate these future traffic volumes (full development of both the Fitzpatrick and OWE sites), including background growth, up to 2026.

For the longer term 2036 scenario, the analysis indicates that the intersection of WNSLR with Lenore Drive may exceed capacity. In response, allowances have been made in the design of this intersection to permit provision of an upgraded layout, should there be a need to improve intersection capacity by 2036. It is however emphasised that this 2036 modelling adopts conservatively high traffic volumes for full development of the subject site and therefore these upgrades may not be required. Accordingly, the future intersection arrangement should be subject to ongoing review as part of the staged delivery of development within the BWSEA.

All other intersections within the study area will operate with acceptable delays and Level of Service under both the 2026 and 2036 development scenarios.

Having regard for the above, the proposed WNSLR and internal road network is supportable on traffic planning grounds.

## 7 Parking Requirements

### 7.1 Proposed Car Parking Rates

Significant technological advances in recent times have resulted in reduced employee densities within warehouse developments, with the 2012 Employment Typology Study for the WSEA, prepared for DP&E, indicating employment densities of less than 20 employees per hectare. As a consequence, many of the industrial developments within the broader WSEA provide car parking significantly in excess of the actual parking requirements of end users.

In this regard, Penrith Council's DCP 2014 Section C10 "Transport, Access and Parking" requires car parking for warehouse or distribution centres to be provided at the rate of 1 space per 100m<sup>2</sup> of GFA (including ancillary office). This rate however applies to all lands within Council's LGA and does not take into account the general type and scale of the developments proposed under this application.

Accordingly, the car parking rates for the OWE have been established based on the approved car parking rates for the Oakdale South Industrial Estate and the warehouse car parking rates outlined in the RMS Guide. In this regard, Section 5.11.2 of the RMS Guide requires parking for warehouse developments be provided at the rate of 1 space per 300m<sup>2</sup> of GFA.

The car parking rate of 1 space per 300m<sup>2</sup> adopted in the RMS Guide was established through surveys of 10 (generally warehouse or freight forwarding facilities) in numerous locations including: facilities. The surveys undertaken by the RMS demonstrated car parking requirements that ranged between one space per 80m<sup>2</sup> and one space per 960m<sup>2</sup> with a mean and standard deviation of one space per 338m<sup>2</sup> and one space per 280m<sup>2</sup> respectively. The adopted rate of 1 space per 300m<sup>2</sup> therefore reflected a "middle range" parking rate. Furthermore, the adopted parking rate was also based on employee densities of approximately 45 employees per hectare – almost double the densities established by the DP&E for the WSEA.

For the purpose of this application, surveys of eight comparable industrial developments have been undertaken to establish the effective parking rate of operational developments within the WSEA – adopting the same methodology as that used in establishing the RMS rate. The surveys included industrial developments

- Erskine Park,
- Oakdale Central; and
- M7 Business Hub.

The results of these surveys are summarised in **Table 6**.

**Table 6: Effective Parking Rates for Surveyed Developments**

Site Address	Car Parking Provided	Total GFA (m <sup>2</sup> )	Maximum Parking Demand	Effective Parking Rate (1 space per X m <sup>2</sup> )
Bunning's – 8 Interchange Dr	140	55,550	68	817
Toll – Lot 11 Wonderland Dr	137	27,440	47	584
Ingram Micro – 23 Wonderland Dr	300	36,610	183	200
DHL – Milner Avenue	115	20,170	109	185
Kimberly Clarke – 35 Sarah Andrews Cl	100	45,210	78	580
Linfox – 25 Sarah Andrews Cl	217	51,200	116	441
Ubeeco – 28 Sarah Andrews Cl	150	10,865	71	153
Woolworths – 29 Sarah Andrews Cl	280	52,705	197	268
<b>Total Average Rate</b>				<b>403</b>

The surveys demonstrated a range of between 1 space per 153m<sup>2</sup> and 1 space per 817m<sup>2</sup> with a mean and standard deviation of 1 space per 403m<sup>2</sup> and 1 space per 241m<sup>2</sup> respectively.

These rates are consistent with those established by the RMS Guide and indeed suggest that a reduction in overall car parking could be justified in comparison to the parking rates provided in Council's DCP. Furthermore, Oakdale South (to the immediate east of Oakdale West) has been approved with a parking rate generally consistent with the RMS Guide.

Having regard for the above, it is recommended that the car parking rates as approved in the Oakdale South be adopted as minimum requirement. The proposed car parking rates are outlined **Table 7**.

**Table 7: Proposed Warehouse Car Parking Rates**

Land Use	Minimum Car Parking Rate
Warehouse / Distribution	1 space per 300m <sup>2</sup>
Office	1 space per 40m <sup>2</sup> (for office component in excess of 20% of total GFA)

The adoption of a minimum rate of 1 space per 300m<sup>2</sup> for the warehouse floor areas and 1 space per 40m<sup>2</sup> for the office floor areas is considered appropriate and sustainable and is consistent with both the RMS Guidelines and State planning policies. The proposed minimum rates will also enable the required flexibility in the design of future developments whilst still ensuring that parking is provided to accommodate both the current and future parking requirements of tenants.

For all other non-warehouse uses it is proposed that parking be provided in accordance with Council's DCP.

## 7.2 Proposed Parking Provision

Application of the proposed parking rate to the floor space proposed under the Masterplan (452,493m<sup>2</sup> of warehouse space and 22,776m<sup>2</sup> of ancillary office space) would result in the minimum provision of approximately 2,078 parking spaces. Nevertheless, the specific car parking provisions for each building will be considered in more detail at the relevant DA stages.

The *Disability (Access to Premises – Buildings) Standards 2010* requires accessible car parking spaces be provided at the following rate for Class 5, 7, 8 and 9c buildings:

- 1 accessible space for every 100 car parking spaces, or part thereof

It is assumed that any subsequent applications will demonstrate a satisfactory provision of accessible car parking is provided.

The design of all car parking areas will be provided in accordance with the relevant Australian Standards including AS2890.1 and AS2890.6.



## 8 Stage 1 Development Application

### 8.1 Description of Proposed Development

A detailed description of the proposed Stage 1 development is provided in the *Environmental Impact Statement* (EIS) prepared by Urbis. Reference should be made to the plans submitted separately to DP&E and Council, which have also been included at reduced scale in **Appendix A**.

The subject SSDA includes a Stage 1 DA in relation to Precinct 1, which will follow the core infrastructure works set out in the OWE Masterplan. The Stage 1 DA for which approval is sought comprises the following key components:

- Construction of 3 warehouse developments within the precinct, having a combined floor space of 116,359m<sup>2</sup> including 109,914m<sup>2</sup> of warehouse GFA and 6,445m<sup>2</sup> of office GFA.
- Provision of a total of 592 car parking spaces across the 3 buildings.

A summary of the key components of the proposed developments within the precinct is provided in **Table 8** below.

**Table 8: Stage 1 DA Summary**

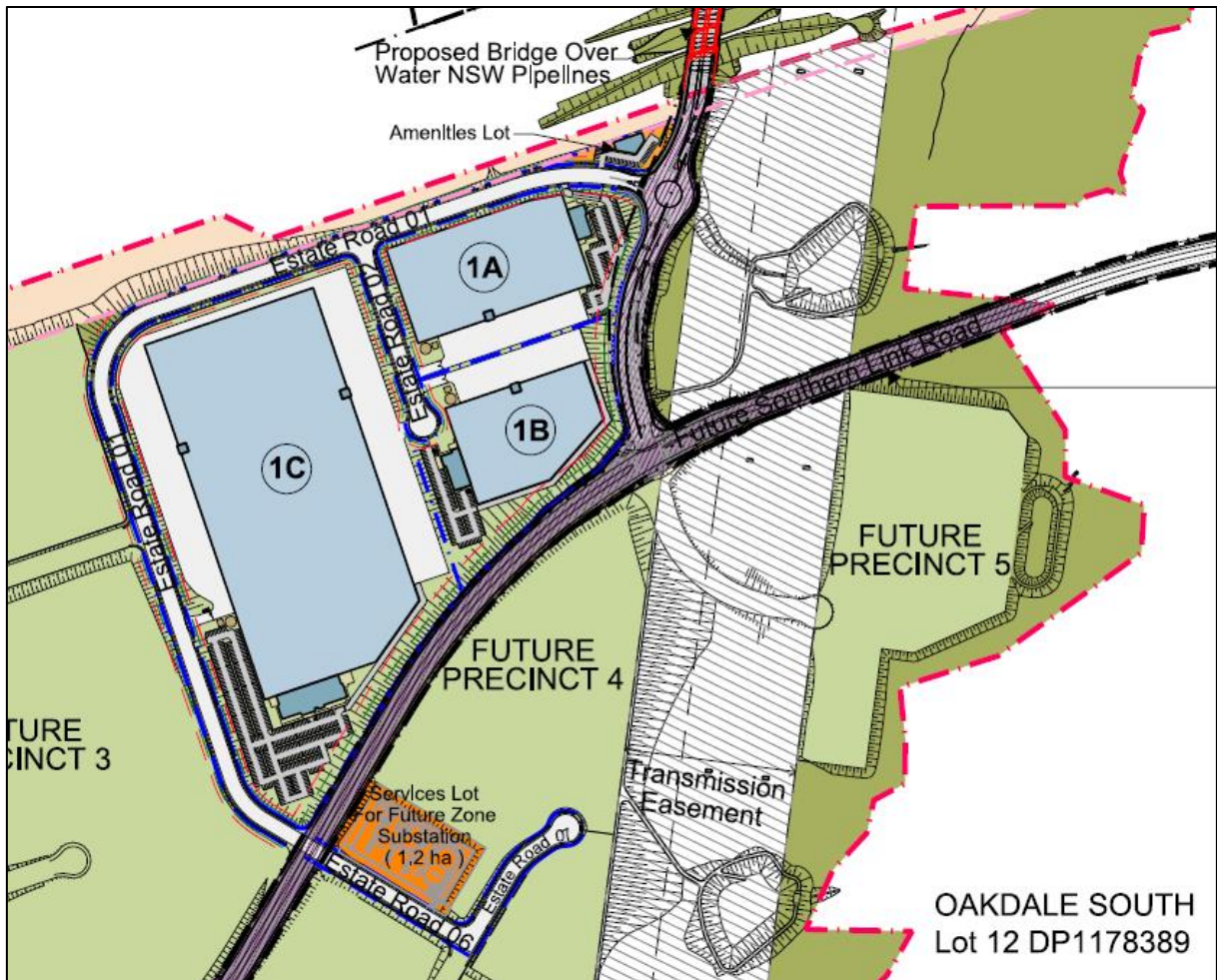
Building	Warehouse GFA (m <sup>2</sup> )	Office GFA (m <sup>2</sup> )	Total GFA (m <sup>2</sup> )	Parking Provision
A	20,627	1,362	21,989	100
B	15,190	995	16,185	106
C	74,097	4,088	78,185	386
<b>Total</b>	<b>109,914</b>	<b>6,445</b>	<b>116,359</b>	<b>592</b>

The traffic and parking impacts arising from the Stage 1 DA are discussed in Section 8.4.

## 8.2 Interim Stage 1 Road Network

The road network for Stage 1 is presented in **Figure 18**, which includes the following key features:

- All access to be provided from the roundabout connecting to the WNSLR via Estate Road 01, and
- Estate Road 01 will continue beyond the car park access of Warehouse 1C and connect with the alignment of the SLR and Estate Road 06.



**Figure 18: Stage 1 Road Network**

## 8.3 Car Parking Requirements

### 8.3.1 Parking Provisions

As outlined in Section 7 above it is proposed that all parking be provided at the minimum rate of 1 space per 300m<sup>2</sup> of warehouse GFA and 1 space per 40m<sup>2</sup> of office GFA, consistent with the Oakdale South approved parking rates. In this regard the following car parking provisions are proposed for each building, as presented in **Table 9** below.

**Table 9: Stage 1 DA Parking Provisions**

Building	Warehouse GFA (m <sup>2</sup> )	Office GFA (m <sup>2</sup> )	Minimum Parking Requirement	Parking Proposed	Effective Parking Rate
A	20,627	1,362	103	100	1 space per 220m <sup>2</sup> GFA
B	15,190	995	76	106	1 space per 153m <sup>2</sup> GFA
C	74,097	4,088	349	386	1 space per 203m <sup>2</sup> GFA
<b>Total</b>	<b>109,914</b>	<b>6,445</b>	<b>528</b>	<b>592</b>	<b>1 space per 197m<sup>2</sup> GFA</b>

The above table demonstrates that a total minimum of 528 parking spaces would be required for this Stage 1 DA proposal. In response, the proposed development provides 592 parking spaces, which exceeds the assessed minimum parking requirements.

It is noted that Lot 1A is 3 car parking spaces short of the minimum parking requirement. However, it still provides parking at an effective rate of 1 space per 220 m<sup>2</sup> GFA, which is higher than the mean effective parking demand rates for the 18 surveyed developments discussed in Section 7.1. **Table 10** provides a comparison of effective parking rates between surveyed developments (average) and OWE Lot 1A.

**Table 10: Effective Parking Rates for Surveyed Developments**

RMS survey (Mean)	WSEA Survey (Mean)	OWE Lot 1A
1 space per 403 m <sup>2</sup> GFA	1 space per 338 m <sup>2</sup> GFA	1 space per 220 m <sup>2</sup> GFA

In this regard, the proposed parking spaces for Lot 1A is deemed to be acceptable, and the parking demands of the proposed Stage 1 development can be satisfied on-site with no reliance for on-street car parking.

### 8.3.2 Accessible Parking

Adopting an accessible parking rate of 1 accessible space per 100 parking spaces (or part thereof), Precinct 1 will require a minimum of 8 accessible spaces (after rounding for individual warehouses) as follows:

- Warehouse 1A 2 accessible spaces,
- Warehouse 1B 2 accessible spaces, and
- Warehouse 1C 4 accessible spaces.

These spaces shall be designed to in accordance with AS 2890.6.

## 8.4 Traffic Impacts

### 8.4.1 Traffic Generation

The traffic generated by the Stage 1 DA has been assessed with regards to the RMS Guide Update traffic generation rates. This includes surveyed traffic generation rates for industrial premises in Erskine Park with a peak hour traffic generation rate of 0.163 vehicles per 100m<sup>2</sup> GFA of industrial (including ancillary office) development. **Table 11** provides a breakdown of the forecast traffic generation for Stage 1.

**Table 11: Oakdale West Stage 1 Traffic Generation**

Building	Total GFA (m <sup>2</sup> )	Traffic Volumes Generated (veh/hr)
1A	21,989	36
1B	16,185	26
1C	78,185	127
<b>Total</b>	<b>116,359</b>	<b>190</b>

Accordingly, Stage 1 of the OWE will generate in the order of 190 veh/hr. This generation represents approximately 25% of the 775 veh/hr estimated for the overall OWE (Precincts 1-5).

### 8.4.2 Traffic Distribution & Assignment

The forecast traffic volumes, in **Table 11** above, have been distributed onto the local road network having regard for the access connections provided by the Stage 1 road network. It is noted that until the completion of the SLR, all traffic within the Precinct will traverse the intersection of WNSLR and Estate Road 01. **Figure 19** and **Figure 20** below presents a summary of the peak hour vehicle volumes

on internal roads having regard for the Stage 1 development. It is assumed that 80% of traffic in the AM peak hour would be arrival trips, with these flows reversed during the evening peak period.

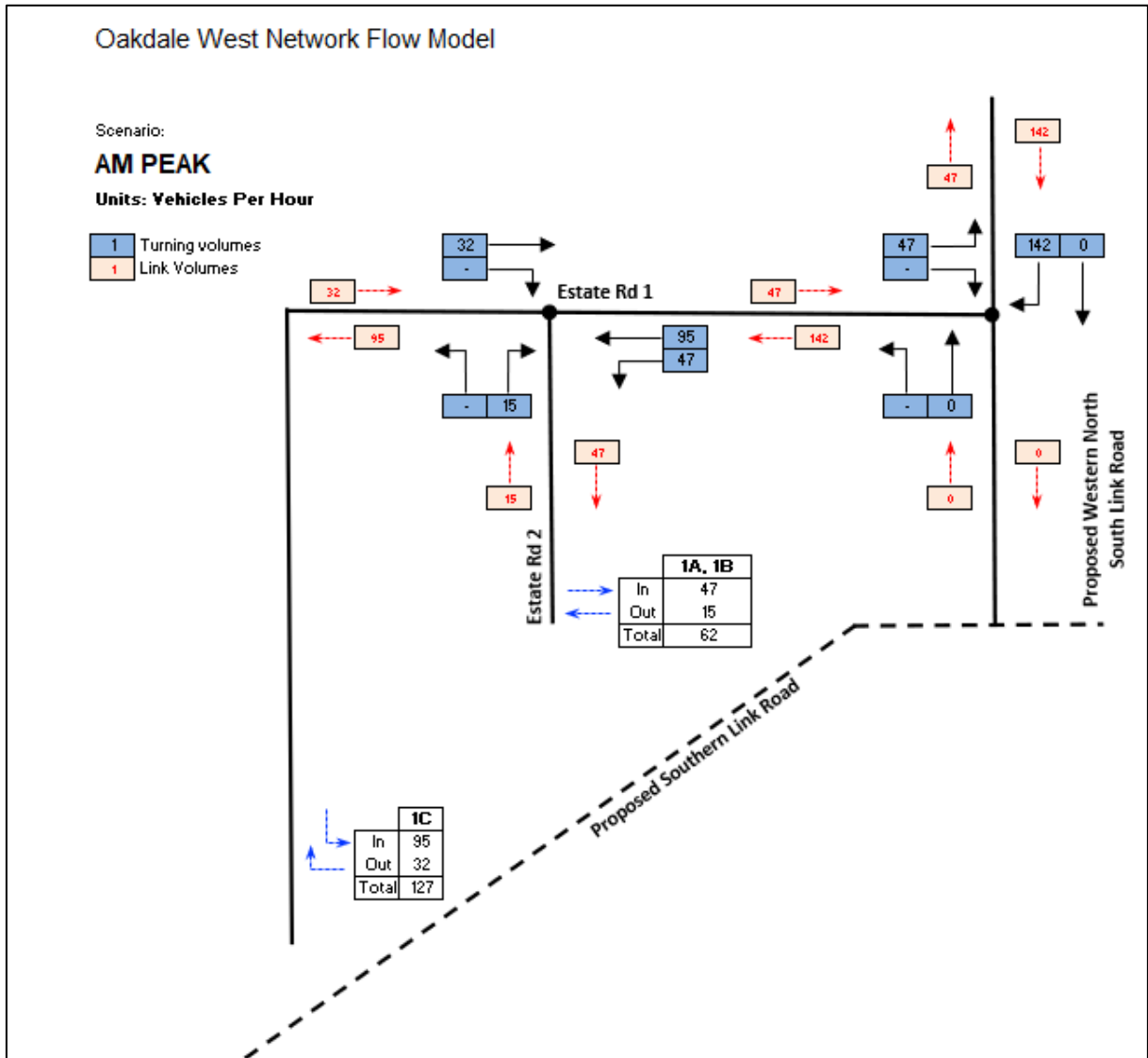
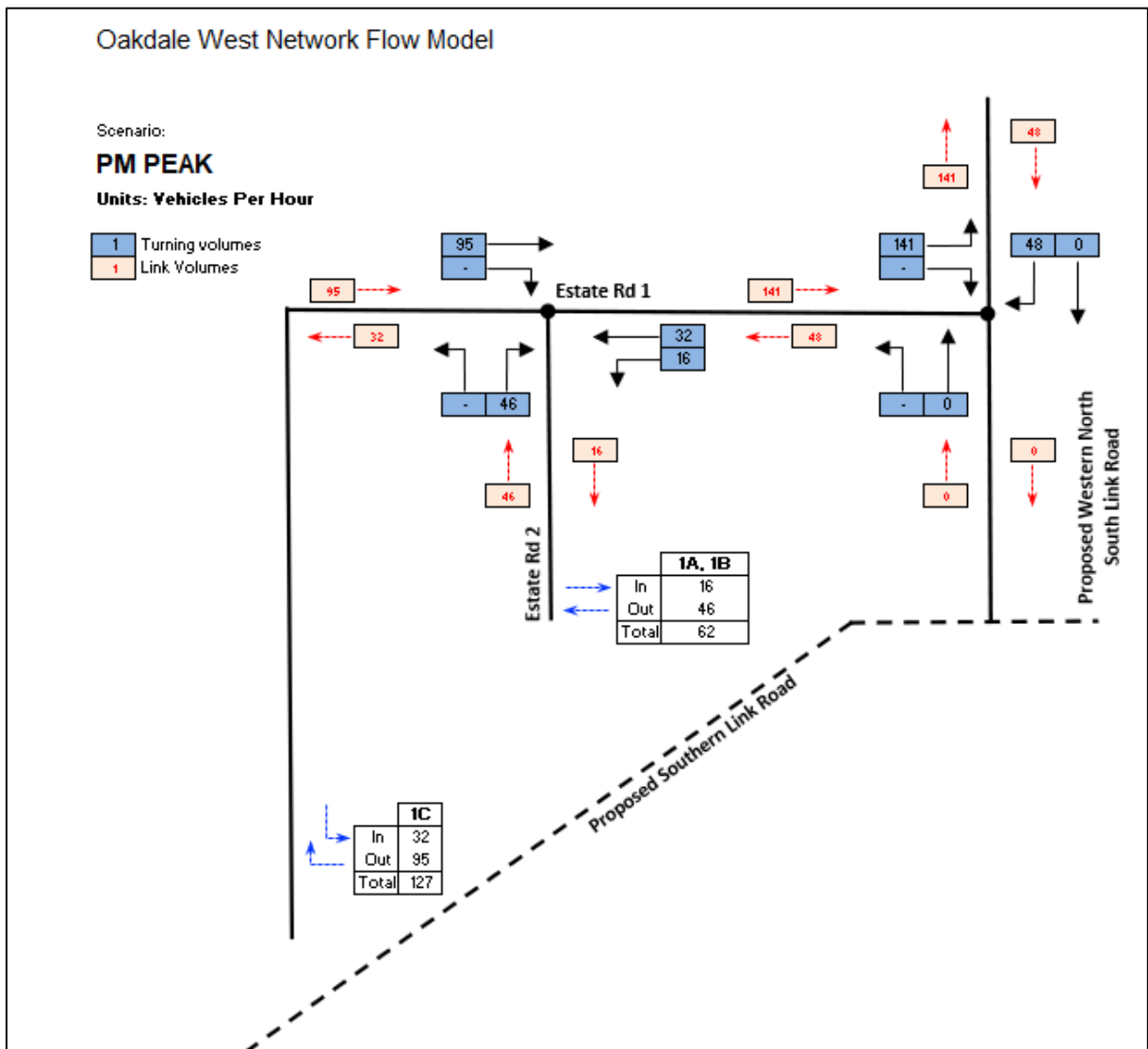


Figure 19: Stage 1 DA AM Peak Traffic Flows





**Figure 20: Stage 1 DA PM Peak Traffic Flows**

#### 8.4.3 Intersection Performance

With reference to the intersection modelling results summarised in Table 4, it can be seen that all intersections along the WNSLR operate at acceptable delays during both peak periods in 2026 (which assumes the full development of the Fitzpatrick and OWE sites). In this regard, the Stage 1 traffic volumes can readily be accommodated by the proposed road network which is designed on the basis of significantly larger future traffic volumes.

## 8.5 Internal Design Aspects

The internal design of the car park and loading areas generally comply with the requirements of AS 2890.1 and AS 2890.2.

Swept path analysis of all critical movements, using computer generated models of design vehicles in accordance with Austroads and Australian Standards, has been undertaken to confirm geometry and compliance with these relevant standards. A copy of this swept path analysis is included in **Appendix C**. Notwithstanding the above, it is expected that a condition of consent would be imposed requiring compliance with AS 2890.1 and AS 2890.2 and any minor adjustments which may be required (if any) can be made prior to issue of Construction Certificate.

## 9 Construction Traffic

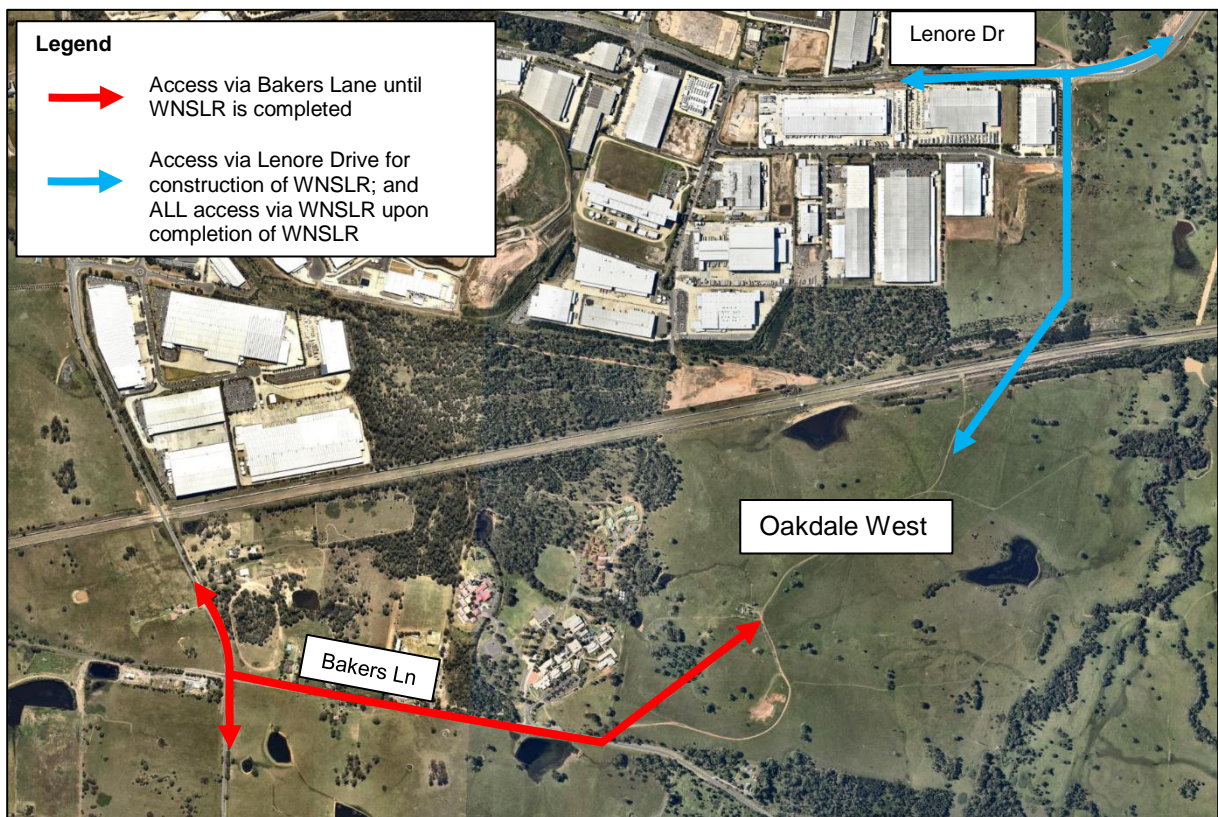
### 9.1 Construction Schedule

The construction of OWE will involve earthworks and construction of road infrastructure prior to the commencement of construction of any warehouses. The anticipated schedule for these works are as follows:

- Earthworks and local infrastructure to occur between January 2019 to February 2020 (14 months)
- Construction of WNSLR to occur concurrently from January 2019 to February 2020 (14 months)
- Stage 1 building works to occur after June 2019

### 9.2 Vehicle Access

The proposed haulage and access routes to the relevant construction areas within OWE would seek to use the arterial road network as much as possible and minimise the use of local roads. In this regard, **Figure 21** describes the proposed construction vehicle access routes.



**Figure 21: Construction Vehicle Access Routes**

In summary, the proposed vehicle access routes to and from the OWE include:

Preliminary Stages:

- Lenore Drive; and
- Bakers Lane via Mamre Road.

Later Stages (upon completion of the WNSLR):

- All access via the WNSLR

Water NSW Pipeline Bridge Crossing:

- Lenore Drive for access to the northern side
- Bakers Lane, via Mamre Road, for access to the southern side; and
- Limited entry (left-in only for vehicles <16 tonne) via Mamre Road and egress to Old Wallgrove Road. It is noted that any use of the Water NSW pipeline service road shall be coordinated with Water NSW and maintain a clear path for emergency maintenance vehicles at all times.

The impacts of which are assessed below.

### 9.3 Construction Vehicle Volumes

The anticipated vehicle movements generated by the construction of the OWE have been estimated having consideration of the likely requirements for construction staff, plant, equipment and haulage. In this regard, the design of the warehouses within OWE minimises the requirement for the importation or exportation of fill, i.e. there would be a balance of cut and fill for the benching of warehouse building envelopes.

Having regard for the above and the anticipated construction schedule, the estimated traffic volumes are as follows:

- Earthworks and local infrastructure – 50 employee vehicles per day and 50 construction vehicles per day (including truck and dog and 3 tonne rigid trucks), accessing OWE via Bakers Lane. This equates to a daily construction generation of about 200 vehicle movements per day.
- Construction of WNSLR – 30 employee vehicles per day and 100 construction vehicles per day (including truck and dog and 3 tonne rigid trucks). This equates to a daily construction generation of about 260 vehicle movements per day.
- Stage 1 building works – less than the anticipated traffic volumes generated by the operation of the Stage 1 development.

During preliminary stages, prior to completion of the WNSLR and its associated Water NSW pipeline crossing, it is anticipated that some construction traffic may use Mamre Road, via Bakers Lane. Any access restrictions imposed by RMS / Council on the use of that connection shall be subject to further negotiation with RMS / Council as part of a subsequent Construction Traffic Management Plan (CTMP) process.

#### 9.4 Construction Traffic Impact Assessment

Construction of the relevant warehouses in Stage 1 will begin upon the completion of the WNSLR (and subsequent intersection works at Lenore Drive); with the traffic generated by construction activities less than that generated by the operation of the entire OWE.

The previous TIA – submitted with the original SSDA - demonstrated that the impact of construction traffic could be readily accommodated by the surrounding road network and hence is not revisited as part of this Response to Submissions traffic report.

Notwithstanding the above, it is expected that a requirement for a Construction Traffic Management Plan (CTMP) will be made a condition of consent and that this document will clearly assesses the future impacts of the construction activities once further details regarding staging and construction traffic movements are confirmed.



## 10 Response to SEARs

The SEARs outline the key areas for consideration in any subsequent assessment, of which this report form part. Relevant responses to the traffic and transport issues raised in the SEARs are outlined below. This includes brief summary and reference to the relevant section of the report where each requirement is addressed in more detail.

**Table 12: Response to SEARs**

SEARs Requirement	Response
Details of all traffic and transport types and volumes likely to be generated during construction and operation, including a description of haul routes.	<p><b>Operational Traffic</b></p> <p>Operational traffic volumes for the Masterplan and Stage 1 SSDA are discussed in Section 6.3 and 8.4.1 respectively.</p> <p>Forecast operational traffic volumes generated by OWE, as presented in Table 3, are estimated to be:</p> <ul style="list-style-type: none"> <li>▪ 775 vehicles per hour during the peak periods, and</li> <li>▪ 8,992 vehicles per day.</li> </ul> <p>This includes approximately 15% commercial vehicle movements, including B-doubles.</p> <p><b>Construction Traffic</b></p> <p>Construction traffic volumes are discussed in Section 9.3.</p> <p>In summary, construction will generally generate less traffic than future operation; with an estimated 260 vehicle movements per day projected. This is expected to truck and dog and other large articulated vehicles.</p> <p>Relevant haulage routes - discussed in Section 9.2 – include a combination of access from Lenore Drive and Bakers Lane.</p> <p>Notwithstanding, it is expected that further detail regarding construction traffic – both in terms of number of movements and haulage routes – will be provided as part of separate detailed Construction Traffic Management Plan (CTMP) for the various works in consultation with Council and RMS following Project Approval and prior to construction.</p>

SEARs Requirement	Response
<p>An assessment of predicted impacts of this traffic on the safety and the capacity of the surrounding road network and access points, current traffic counts and modelling of key intersections including Milner Drive and Old Wallgrove Road</p>	<p>The traffic impacts of the proposed Western North-South Link Road (WNSLR) and Oakdale West Estate (OWE) generally are addressed in Section 6 of this report.</p> <p>No access to Old Wallgrove Road or Milner Avenue is proposed. Accordingly, assessment of current traffic at the referred intersection is unnecessary in the context of this SSDA.</p> <p>In summary, the predicted traffic generated by OWE and the broader area can be accommodated by the proposed WNSLR connection to Lenore Drive and the future SLR. An Aimsun model, developed by GHD, has been provided to build upon the existing traffic model of BWSEA. This model forecasts 2026 and 2036 traffic volumes having regard for regional traffic growth, the proposed WNSLR and traffic generated by both the OWE and the Fitzpatrick site to the north.</p> <p>The results indicated that all intersections operate with acceptable levels of delay in 2036, with the exception of the WNSLR / Lenore Drive intersection. This intersection may potentially require capacity upgrades to address future 2036 volumes.</p> <p>However, it is noted that the requirement for this upgrade is not solely attributed to traffic generated by OWE as the WNSLR will provide a north-south connection between Lenore Drive and the SLR to benefit others and the operation of the wider regional road network. Furthermore, this modelling adopts conservative assumptions with regard to the developable area of lands contained with WSEA and therefore traffic volumes may be less than would require provision of these additional turning lanes. Notwithstanding, the design of the proposed WNSLR and the associated intersections would ensure that these upgrades could be implemented by others should it be required at some point in the future.</p> <p>In the event that the traffic volumes assessed are reached; then an alternate layout – as presented in Figure 17 - would achieve a satisfactory level of performance.</p>

SEARs Requirement	Response
<p>Details of proposed site accesses, including detailed consideration of various access options, justification for the proposed location of the main access points and compliance with Australian Standards.</p>	<p>Until such time that the SLR is built, OWE will be accessed from the WNSLR, which is proposed as part of this application. The WNSLR will connect to the external road network at Lenore Drive and its alignment would be consistent with the planned road network for WSEA. This Estate access is proposed via a signalised intersection as a public road connection with the WNSLR and therefore is subject to the design requirements of Austroads.</p> <p>In the longer term, access will also be provided by the Southern Link Road, however the delivery of that connection is the responsibility of Department of Planning &amp; Environment (DP&amp;E) and Transport for NSW. Recognising that the timeframe for the completion of the SLR is currently unknown – currently undergoing preliminary design by RMS - provision has been made to ensure full accessibility to the respective precincts with access to/from the regional road network solely via the WNSLR and Lenore Drive. Secondary access points are provided along the SLR, should the road be built.</p> <p>Site access to individual warehouse buildings within the Estate will be subject of separate Development Application submissions. In this regard, all internal Estate Road access points and internal driveways, service and circulation areas will be compliant with AS 2890.1 and AS 2890.2.</p> <p>Swept path analysis of all critical movements, using computer generated models of design vehicles in accordance with Austroads and Australian Standards, have been undertaken to confirm geometry and compliance with the relevant standards in relation to the Stage 1 DA included as part of this submission. The swept path assessment is included in Appendix C.</p>
<p>A discussion of any interactions between the proposed local internal roads and the preferred alignment for the Southern Link Road Network (as identified in the plan exhibited as part of the WSEA SEPP amendment late 2014) having regard to clause 26 of the WSEA SEPP.</p>	<p>The WSEA SEPP establishes the framework for a regional road network to service the growth of the WSEA into an industrial and warehousing hub. Clause 26 of the WSEA SEPP requires that the consent authority must consider any comments made by the Director-General as to the compatibility of proposed development with proposed transport infrastructure identified under the policy. Of particular relevance to the Site is the proposed future SLR, running through the southern portion of the Site, providing a connection between Wallgrove Road in the east and Mamre Road in the west.</p> <p>Having regard for the above, provision has been made for SLR in the Masterplan, as shown in Figure 4, for the future alignment of the SLR. This adopts an alignment consistent with that detailed in the WSEA SEPP. With reference to the Masterplan, a number of access points are proposed with the future SLR, which are as follows:</p> <ul style="list-style-type: none"> <li>▪ Left-in/left-out access to/from Estate Road 01 (both westbound and eastbound to Precincts 1-3 and Precinct 4, respectively),</li> <li>▪ Left-in/left-out access to/from Estate Road 3 (eastbound), and</li> <li>▪ A fourth approach to the signalised intersection between the WNSLR and the SLR to provide access to Precinct 5 via Estate Road 8.</li> </ul>

SEARs Requirement	Response
<p>Detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian standards.</p>	<p>The layout of the internal road network can be seen in the proposed Masterplan layout presented in Figure 4 of this report.</p> <p>Internal estate roads will be designed as two-lane industrial access roads, providing appropriate width and internal intersection geometry to accommodate the maximum sized vehicles (B-doubles) accessing individual sites.</p> <p>Site access and car park design of the Stage 1 (Precinct 1) buildings has been assessed and complies with the requirements of AS 2890.1, AS 2890.2 and AS 2890.6, where relevant. Subsequent Precincts will be subject to further detailed assessment at DA stage.</p>

## 11 Conclusions

In summary, the key findings of this Traffic Impact Assessment are:

- The proposed application is for the staged development of the Oakdale West Industrial Estate which consists of 154 hectares of land, located within the WSEA. This SSDA comprises the third of four stages of the development of the broader Oakdale Industrial Estate and generally incorporates:
  - A Masterplan for Oakdale West, establishing road layouts (including regional road connections and links to surrounding lands), development precincts, building footprints and proposed development controls for future development.
  - Subdivision of Oakdale West into 5 development Precincts.
  - Staged delivery of essential infrastructure.
  - Stage 1 building works, specifically comprising the construction of warehouse buildings in Precinct 1.
- A number of traffic and transport assessments have been undertaken that have informed the delivery of infrastructure within the WSEA and these assessments have included traffic volumes for the broader Oakdale Industrial Estate commensurate with that now proposed. Accordingly, the previously planned infrastructure requirements are essentially unaffected by the subject proposal.
- Further detailed modelling in relation to the impact of the Western North-South Link Road has also been assessed which resulted in the following findings:
  - Full development of the OWE and Fitzpatrick sites can be accommodated to 2026 by the currently planned road network.
  - Additional background traffic growth to 2036 may require further capacity improvements to the intersection of the Western North-South Link Road and Lenore Drive. It is emphasised that these works are a result of further background regional traffic growth from the 2026 to 2036 design years and not solely attributable to the OWE traffic. Notwithstanding, sufficient space has been provided at this intersection to accommodate the additional turning lanes necessary should these forecast traffic volumes be realised and improvement works be required at some point in the future.
- It is proposed that the minimum car parking rates (1 space per 300m<sup>2</sup> GFA) for the OWE be based on the RMS *Guide to Traffic Generating Developments* rates for warehouse developments. To provide flexibility, it is recommended that this rate be set as a minimum requirement such that additional car parking (commensurate with Council's DCP rate of 1 space per 100m<sup>2</sup> GFA) may be



provided, if desired by future tenants. Car parking for other uses are to be subject to Penrith City Council parking rates.

- Application of the above rates to the Stage 1 DA buildings will require a total of 528 parking spaces. In response, 592 spaces are proposed which readily satisfies this minimum requirement (based on RMS Guide rates) and forms a suitable balance between the minimum requirement and Council's nominal requirement (1,164 spaces).
- The internal configuration of the car park and loading areas generally comply with the relevant requirements of both AS 2890.1 and AS 2890.2. It is expected that a condition of consent can be imposed requiring compliance with AS 2890.1 and AS 2890.2 and any minor adjustments which may be required (if any) can be made at Construction Certificate stage.

It is therefore concluded that the Oakdale West Industrial Estate development is supportable on traffic planning grounds. Appropriate car parking can be provided, and the traffic impacts of the development can be readily accommodated by the planned road network in the vicinity of the site.

# Appendix A

## Reduced Plans

PROPOSED INDUSTRIAL FACILITIES

PRECINCT 1  
OAKDALE WEST  
Estate Road HORSLEY PARK, NSW 2175

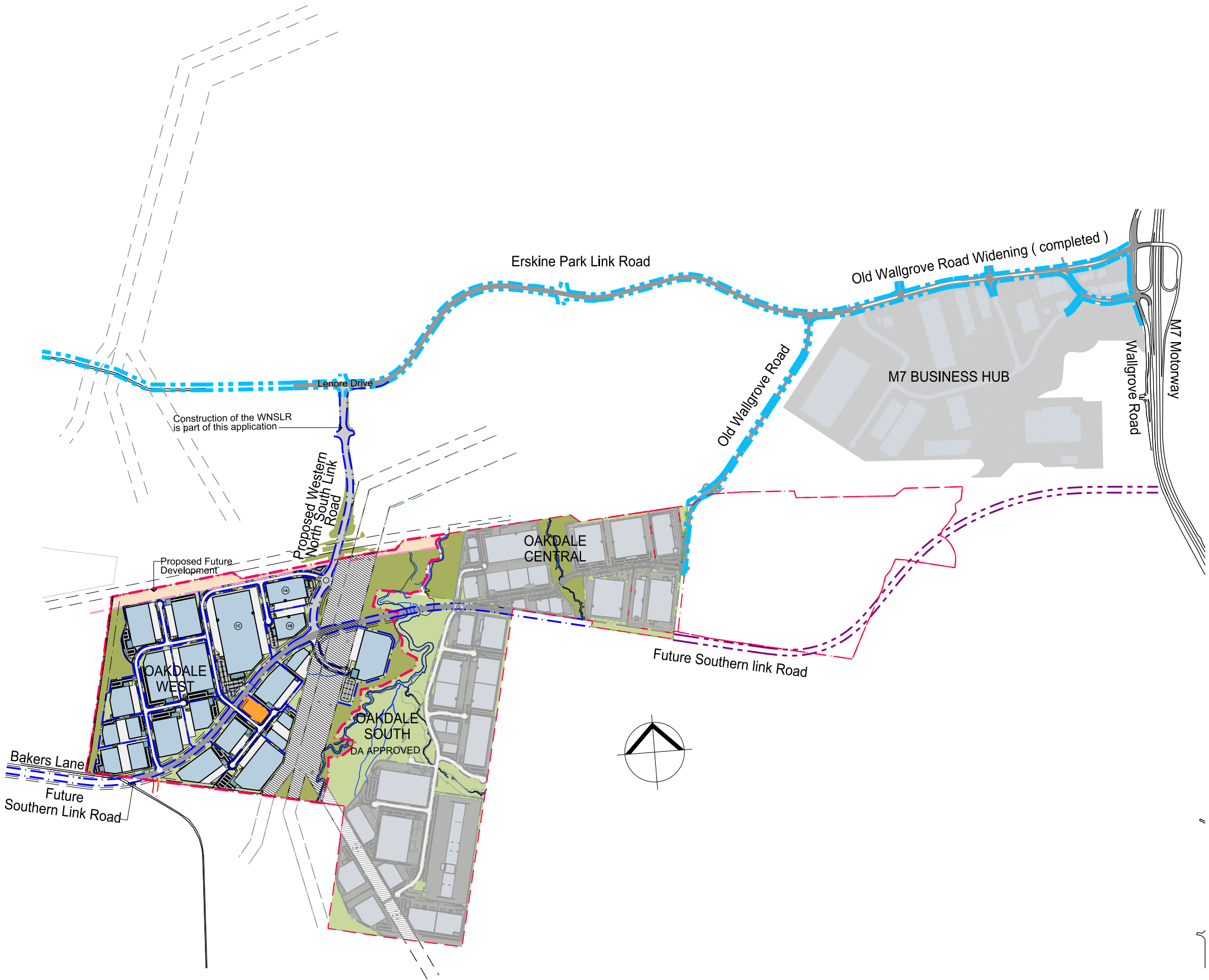
Drawing List

OAK MP01	Y	Cover Sheet & Location
OAK MP02	AW	SSDA Masterplan
OAK MP03	X	Western North South Link Road
OAK MP04	Z	SSDA Stage 1 Development
OAK MP05	Z	Precinct 1 Masterplan
OAK MP06	V	Precinct Plan
OAK MP07	U	Indicative Ultimate Lot Layout
OAK MP08	T	Site Ananlysis Plan
OAK MP09	Q	Existing Zoning
OAK MP10		Not Used
OAK MP11	S	Building Staging Plan (Indicative)
OAK MP12	P	Signage Precinct 1 Plan
OAK MP13	S	Fire Protection Plan
OAK MP14	Y	Biodiversity Management Plan

OAK 1A DA10	J	Site Plan / Floor Plan
OAK 1A DA11	D	Roof Plan
OAK 1A DA12	D	Office Plan Ground Floor
OAK 1A DA13	D	Office Plan First Floor
OAK 1A DA14	D	Elevations Office
OAK 1A DA15	D	Elevations
OAK 1A DA16	E	Sections

OAK 1B DA20	G	Site Plan / Floor Plan
OAK 1B DA21	D	Roof Plan
OAK 1B DA22	C	Office Plan
OAK 1B DA24	C	Elevations Office
OAK 1B DA25	C	Elevations
OAK 1B DA26	C	Sections

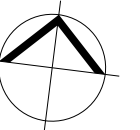
OAK 1C DA30	J	Site Plan / Floor Plan
OAK 1C DA31	D	Roof Plan
OAK 1C DA32	C	Office Plan Ground Floor
OAK 1C DA33	C	Office Plan First Floor
OAK 1C DA34	C	Elevations Office
OAK 1C DA35	D	Elevations Sheet 1
OAK 1C DA36	D	Elevations Sheet 2
OAK 1C DA37	D	Sections







Site Area Schedule	
Total Site Area	154.12 ha
Less:	
Non Developable Land	20.77 ha
Easements	22.45 ha
Regional Roads	6.59 ha
Services Lot	1.26 ha
Estate Roads	8.62 ha
E2 Zone non developable	1.43 ha
	61.12 ha
Development Areas	
Precinct 1	21.40 ha
Precinct 2	19.51 ha
Precinct 3	18.50 ha
Precinct 4	22.39 ha
Precinct 5	6.02 ha
Proposed Future Development	4.85 ha
Amenities Lot	.323 ha
Total Developable	
Total Warehouse	452,493 sqm
Total Office	22,776 sqm
Total Facility	475,269 sqm



## **Appendix B**

# **Secretary's Environmental Assessment Requirements**

## Secretary's Environmental Assessment Requirements

### Section 78A(8A) of the *Environmental Planning and Assessment Act 1979*

#### State Significant Development

<b>Application Number</b>	SSD 15_7348
<b>Development</b>	<p>The staged development of a warehouse and distribution estate, including:</p> <ul style="list-style-type: none"> <li>• a Concept Proposal for the warehouse and distribution estate comprised of 22 building envelopes, including a development master plan, development controls, landscape concept plan and biodiversity offsets; and</li> <li>• Stage 1 Development Application, including: <ul style="list-style-type: none"> <li>– staged bulk earthworks across the whole site;</li> <li>– staged trunk infrastructure for the site;</li> <li>– staged subdivision;</li> <li>– landscaping and public domain works; and</li> <li>– development comprising the construction and operation of three warehouse and distribution facilities in Precinct 1.</li> </ul> </li> </ul>
<b>Location</b>	Lot 11 DP 1178389, Lot 1 DP 663937, Part Lot 3 DP 85393, Part Lot 2 DP 84578, Part Lot 6 DP 229784 and Part Lot 3031 DP 1168407, Kemps Creek and Erskine Park, Penrith
<b>Applicant</b>	Goodman Property Services (Aust) Pty Ltd
<b>Date of Issue</b>	November 2015
<b>Date of Revision</b>	October 2017
<b>General Requirements</b>	<p>The Environmental Impact Statement (EIS) for the development must meet the form and content requirements of clauses 6 and 7 to Schedule 2 of the <i>Environmental Planning and Assessment Regulation 2000</i>. In addition, the EIS must include a:</p> <ul style="list-style-type: none"> <li>• detailed description of the development, including: <ul style="list-style-type: none"> <li>– need and justification for the development;</li> <li>– likely staging of the development;</li> <li>– likely interactions between the development and existing, approved and proposed operations in the vicinity of the site;</li> <li>– layout and design, including plans of any proposed building works;</li> <li>– identification of the preferred alignment of the Southern Link Road Network (as identified in the plan exhibited as part of the WSEA SEPP amendment late 2014), and the bridge connection required for the development, in all relevant plans; and</li> <li>– written and graphical description of proposed infrastructure and service provision (including any required off-site upgrades);</li> </ul> </li> <li>• consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with those instruments;</li> <li>• risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment;</li> <li>• detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, including: <ul style="list-style-type: none"> <li>– a description of the existing environment, using sufficient baseline data;</li> <li>– an assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes;</li> <li>– a description of the measures that would be implemented to avoid, minimise, mitigate and if necessary, offset the potential impacts of the development, including proposals for adaptive management and/or contingency plans to manage significant risks to the environment; and</li> </ul> </li> <li>• a summary of all of the proposed environmental management and monitoring</li> </ul>



	<p>measures, highlighting commitments included in the EIS.</p> <p>The EIS must also be accompanied by a report from a qualified quantity surveyor providing:</p> <ul style="list-style-type: none"> <li>• a detailed calculation of the capital investment value (CIV) of the proposal as defined at clause 3 of the <i>Environmental Planning and Assessment Regulation 2000</i>, including details of all components of the CIV;</li> <li>• an estimate of jobs that will be created by the development during its construction and operational phases; and</li> <li>• certification that the information provided is accurate at the date of preparation.</li> </ul>
<b>Key issues</b>	<p>The EIS must address the following specific matters that relate to the master plan and Stage 1 works:</p> <ul style="list-style-type: none"> <li>• <b>Strategic and Statutory Context</b> – including: <ul style="list-style-type: none"> <li>– address the relevant statutory provisions applying to the site contained in the relevant EPIs, including: <ul style="list-style-type: none"> <li>○ <i>State Environmental Planning Policy (State and Regional Development) 2011</i>;</li> <li>○ <i>State Environmental Planning Policy No. 33 – Hazardous and Offensive Development</i>;</li> <li>○ <i>State Environmental Planning Policy No. 55 – Remediation of Land</i>;</li> <li>○ <i>State Environmental Planning Policy (Infrastructure) 2007</i>; and</li> <li>○ <i>State Environmental Planning Policy (Western Sydney Employment Area) 2009</i> (WSEA SEPP);</li> </ul> </li> <li>– address the relevant provisions, goals and strategic objectives in the following: <ul style="list-style-type: none"> <li>○ <i>State Plan – NSW 2021</i>;</li> <li>○ <i>A Plan for Growing Sydney</i>;</li> <li>○ <i>Draft West Central &amp; South West Subregional Strategy</i>; and</li> <li>○ relevant Development Control Plans (DCPs) and justification for any inconsistencies; and</li> </ul> </li> <li>– justification for the proposed site layout, considering the environmental constraints and suitability of the site.</li> </ul> </li> <li>• <b>Planning Agreement/Developer Contributions</b> – demonstration that satisfactory arrangements have been or would be made to provide, or contribute to the provision of, necessary local and regional infrastructure required to support the development.</li> <li>• <b>Transport</b> – including: <ul style="list-style-type: none"> <li>– details of all traffic and transport types and volumes likely to be generated during construction and operation, including a description of haul routes;</li> <li>– an assessment of predicted impacts of traffic generation on the safety and capacity of the surrounding road network and access points, using current traffic counts and modelling of key intersections, including Milner Drive and Old Wallgrove Road;</li> <li>– details of proposed site access, including detailed consideration of access options, justification for the proposed locations of main access points, and compliance with Australian Standards;</li> <li>– plans of any road upgrades or new roads required for the development;</li> <li>– a discussion of any interactions between the proposed local internal roads and the preferred alignment for the Southern Link Road Network (as identified in the plan exhibited as part of the WSEA SEPP amendment 2014) with regard to clause 26 of the WSEA SEPP; and</li> <li>– detailed plans of the proposed internal road network layout and on-site parking in accordance with the relevant Australian standards.</li> </ul> </li> <li>• <b>Urban Design and Visual</b> – including: <ul style="list-style-type: none"> <li>– development layout, including staging, site coverage, lot sizes, setbacks, proposed open space and landscaped areas;</li> <li>– suitable landscaping incorporating endemic species;</li> <li>– details of controls for building heights and design, setbacks, floor space ratio, stormwater management and drainage, flooding, access and parking, landscaping, waste removal and storage, and energy and water efficiency/conservation requirements;</li> <li>– outline and justify any inconsistencies with existing precinct plans or other</li> </ul> </li> </ul>

	<p>DCPs applicable to the locality; and</p> <ul style="list-style-type: none"> <li>- provide a visual impact assessment (including photomontages and perspectives) of the development layout and design (buildings and storage areas), including height, colour, scale, building materials and finishes, signage and lighting, having regard to surrounding residential receivers and clause 23 of the WSEA SEPP particularly in terms of potential impacts on: <ul style="list-style-type: none"> <li>o nearby public and private receivers; and</li> <li>o significant vantage points in the broader public domain including Greenway Place in Horsley Park.</li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>• <b>Soil and Water</b> - including: <ul style="list-style-type: none"> <li>- a detailed description of all potential impacts on the watercourses/riparian land (including watercourse realignments), existing riparian vegetation and the rehabilitation of riparian land, including a draft vegetation management plan;</li> <li>- a detailed and consolidated site water balance;</li> <li>- assessment of potential impacts on surface and groundwater sources (quality and quantity), soil (including contamination, salinity and acid sulphate soil), related infrastructure, watercourses, riparian land and measures proposed to reduce and mitigate those impacts;</li> <li>- describe surface and stormwater management measures designed in accordance with Water Sensitive Urban Design principles, including on-site detention, measures to treat or reuse water, and proposed and uses of potable and non-potable waters;</li> <li>- full technical details and data of all surface and groundwater modelling;</li> <li>- proposed surface and groundwater monitoring activities and methodologies;</li> <li>- assessment of any potential cumulative impacts on water resources, and any proposed options to manage those impacts;</li> <li>- description of proposed erosion and sediment controls during construction and operation; and</li> <li>- proposed cut and fill works associated with the development, and measures to minimise the extent of cut and fill.</li> </ul> </li> <li>• <b>Flooding</b> – including: <ul style="list-style-type: none"> <li>- a detailed hydrological and hydraulic assessment, which includes the following: <ul style="list-style-type: none"> <li>o a comprehensive assessment of the impact of flooding on the development for the full range of flood events up to the probable maximum flood. This assessment should address any relevant provisions of the NSW Floodplain Development Manual (2005) including the potential effects of climate change, sea level rise and an increase in rainfall intensity;</li> <li>o assessment of the impact of the development on flood behaviour (i.e., levels, velocities and duration of flooding) and on adjacent, downstream and upstream areas;</li> <li>o detail proposed floor levels for all proposed habitable structures on the site having considered the full range of flood events up to the probable maximum flood; and</li> <li>o detail an emergency response plan for the site, which includes consideration of a flood-free access to or from the development site in extreme flood events.</li> </ul> </li> </ul> </li> <li>• <b>Infrastructure Requirements</b> – including: <ul style="list-style-type: none"> <li>- a detailed written and/or geographical description of infrastructure required on the site;</li> <li>- identification of any infrastructure upgrades required off-site to facilitate the development, and describe any arrangements to ensure that the upgrades will be implemented in a timely manner and maintained;</li> <li>- an infrastructure delivery and staging plan, including a description of how infrastructure on and off-site will be co-ordinated and funded to ensure it is in place prior to the commencement of construction; and</li> <li>- an assessment of the impacts of the development (construction and operation) on existing infrastructure surrounding the site.</li> </ul> </li> <li>• <b>Noise</b> – including: <ul style="list-style-type: none"> <li>- description of all potential noise sources, including construction, operational,</li> </ul> </li> </ul>
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	<p>and on and off-site traffic noise;</p> <ul style="list-style-type: none"> <li>- a noise impact assessment, including cumulative noise in accordance with relevant Environment Protection Authority guidelines; and</li> <li>- details of noise mitigation, management and monitoring measures.</li> </ul> <ul style="list-style-type: none"> <li>• <b>Air Quality and Odour</b> – including: <ul style="list-style-type: none"> <li>- an assessment of the potential air quality impacts (particularly dust) of the development on surrounding receivers, including from construction, operation and transport;</li> <li>- an assessment of potential odour impacts; and</li> <li>- details of proposed mitigation, management and monitoring measures.</li> </ul> </li> <li>• <b>Biodiversity</b> – including: <ul style="list-style-type: none"> <li>- assessment and documentation of biodiversity impacts, including on groundwater dependent ecosystems, related to the development in accordance with the <i>NSW Biodiversity Offsets Policy for Major Projects</i> (2014) and the Framework for Biodiversity Assessment, in accordance with section 142B(1)(c) of the <i>Threatened Species Conservation Act 1995</i>.</li> </ul> </li> <li>• <b>Aboriginal Cultural Heritage</b> – including: <ul style="list-style-type: none"> <li>- Aboriginal cultural heritage in accordance with the relevant OEH guidelines. Any impacts on Aboriginal cultural heritage as a result of the development must be adequately mitigated;</li> <li>- where it is likely that the development will impact upon Aboriginal cultural heritage, adequate community consultation should take place regarding the assessment of significance, likely impacts, and management/mitigation measures; and</li> <li>- describe any actions that will be taken in order to avoid or mitigate impacts the development may have on Aboriginal cultural heritage.</li> </ul> </li> <li>• <b>Subdivision</b> <ul style="list-style-type: none"> <li>- provide details, including a plan of subdivision, of any staging that demonstrates the lots will be released in an orderly and coordinated manner including the release of lots for sale, the installation of services and infrastructure.</li> </ul> </li> <li>• <b>Bushfire</b> – including consideration of bush fire measures as outlined in <i>Planning for Bushfire Protection 2006</i>, particularly asset protection zones, access and water/utilities.</li> <li>• <b>Greenhouse Gas and Energy Efficiency</b> - including an assessment of the energy use on-site, and demonstrate the measures to be implemented to ensure the proposal is energy efficient.</li> <li>• <b>Waste Management</b> – during construction and operation.</li> </ul>
<b>Plans and Documents</b>	<p>The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 to the <i>Environmental Planning and Assessment Regulation 2000</i>. Provide all such documentation as part of the EIS rather than separate documents.</p>
<b>Consultation</b>	<p>During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular, you must consult with:</p> <ul style="list-style-type: none"> <li>• Penrith City Council;</li> <li>• Fairfield City Council;</li> <li>• Blacktown City Council;</li> <li>• Roads and Maritime Services;</li> <li>• Department of Primary Industries;</li> <li>• Environment Protection Authority;</li> <li>• Office of Environment and Heritage;</li> <li>• Rural Fire Service;</li> <li>• Water NSW;</li> <li>• Sydney Water;</li> <li>• TransGrid;</li> <li>• Endeavour Energy;</li> <li>• AGL; and</li> <li>• surrounding landowners/occupiers who may be affected by the proposal.</li> </ul>

	The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.
<b>Further consultation after 2 years</b>	If you do not lodge an EIS for the development within 2 years of the issue date of these SEARs, you must consult with the Secretary in relation to the requirements for lodgement.
<b>References</b>	The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. Whilst not exhaustive, the <b>Attachment 1</b> contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this development.

## Appendix C

### Swept Path Analysis

Estate

+ RL 69.00

Truck  
Entry / Exit

Sprinkler  
Tank

Pump  
Room

FNC-2

Swing Security  
Gate

B-Double (26m)

Estate

+ RL 69.00

Truck  
Entry / Exit

Sprinkler  
Tank

Pump  
Room

FNC-2

Swing Security  
Gate

B-Double (26m)

A/C Unit (26m)

Notes:

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Document Info:

Drawn by: Shihui Hu  
File name: 0129d03 Stage 1 - OWE.dwg

Client:

Goodman Property Service (Aust) PTY LTD

Project:

0129  
Oakdale West Estate (1A)

Drawing Title:

26m B-double  
Site Access - Ingress & Egress

Date:

24-Sep-18

Scale @ A3:

1:300

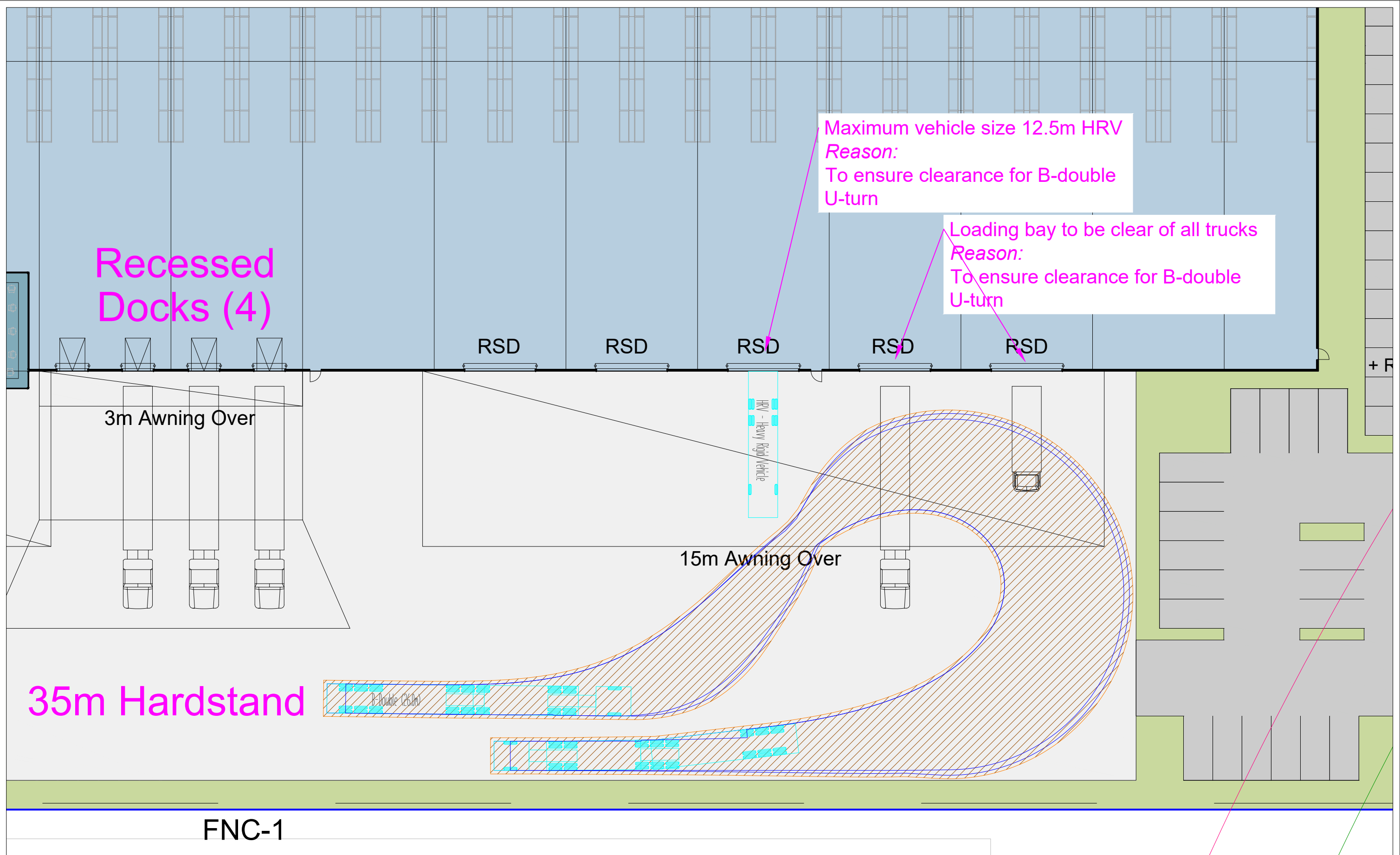
Drawing Number:

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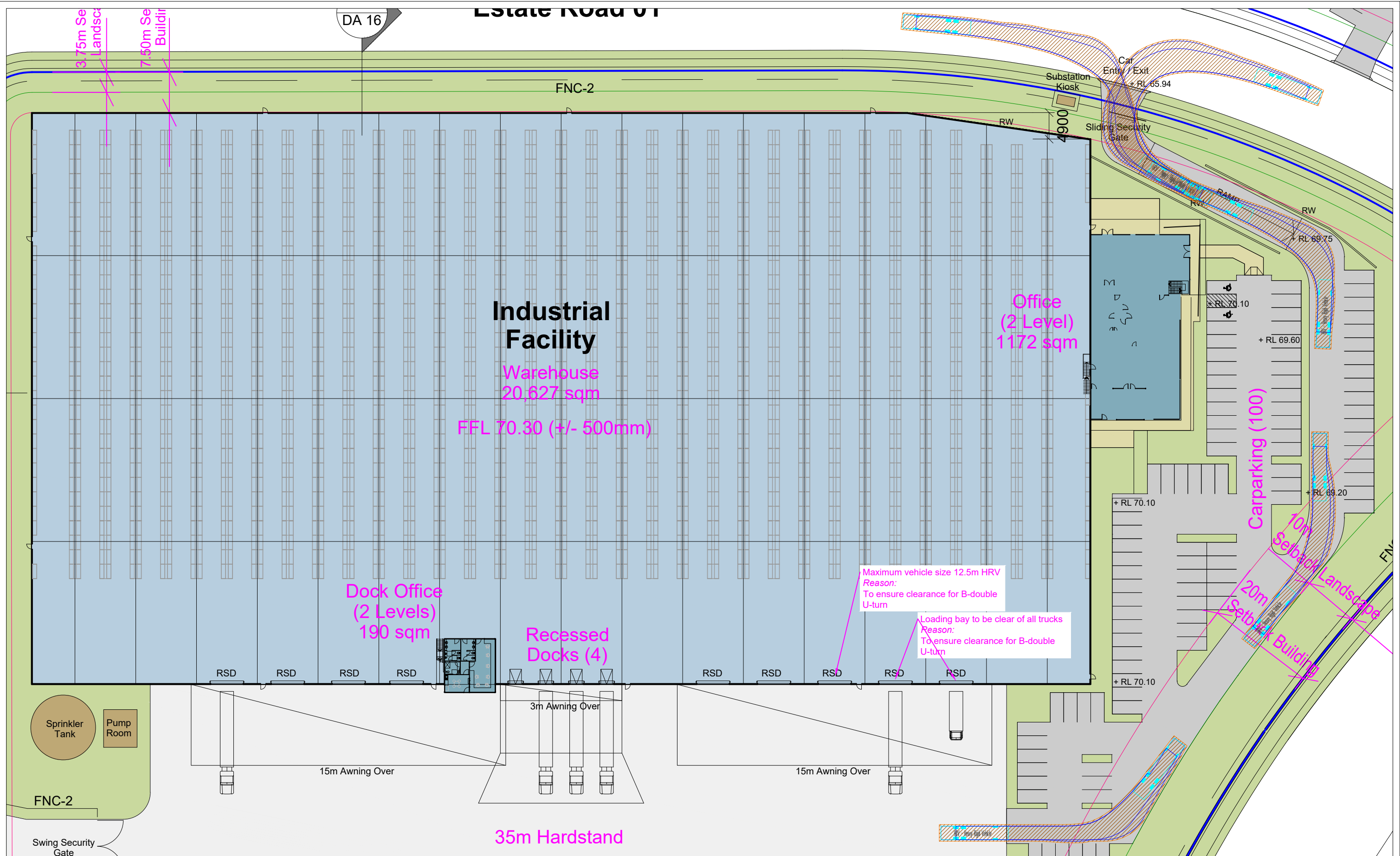
**asongroup**

Suite 1202, Level 12, 220 George Street  
Sydney NSW 2000  
info@asongroup.com.au

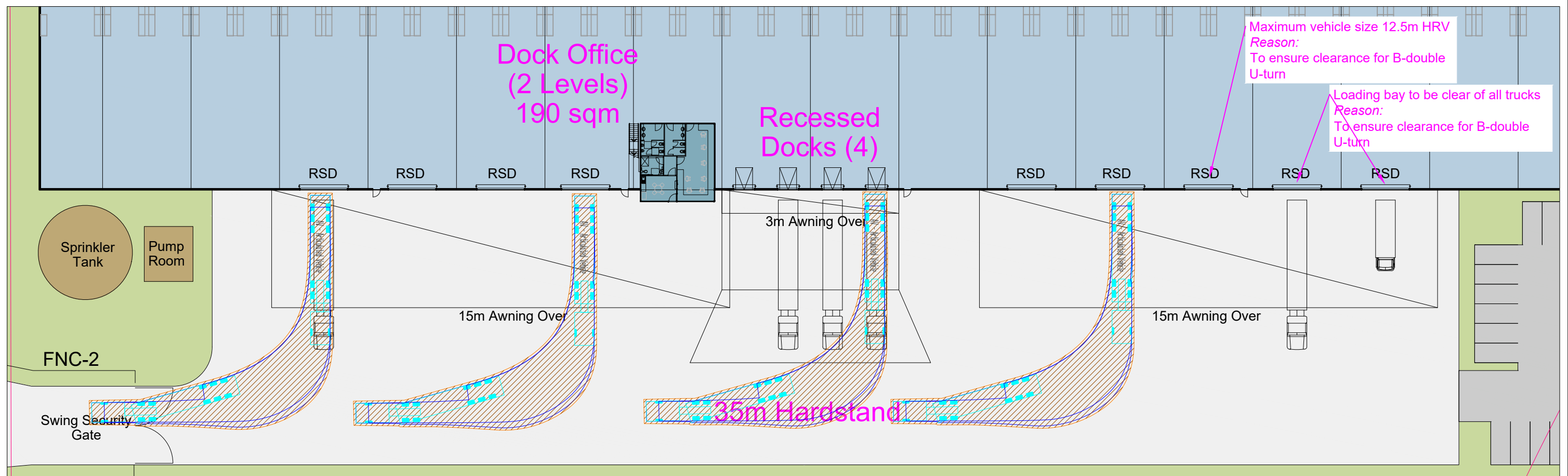
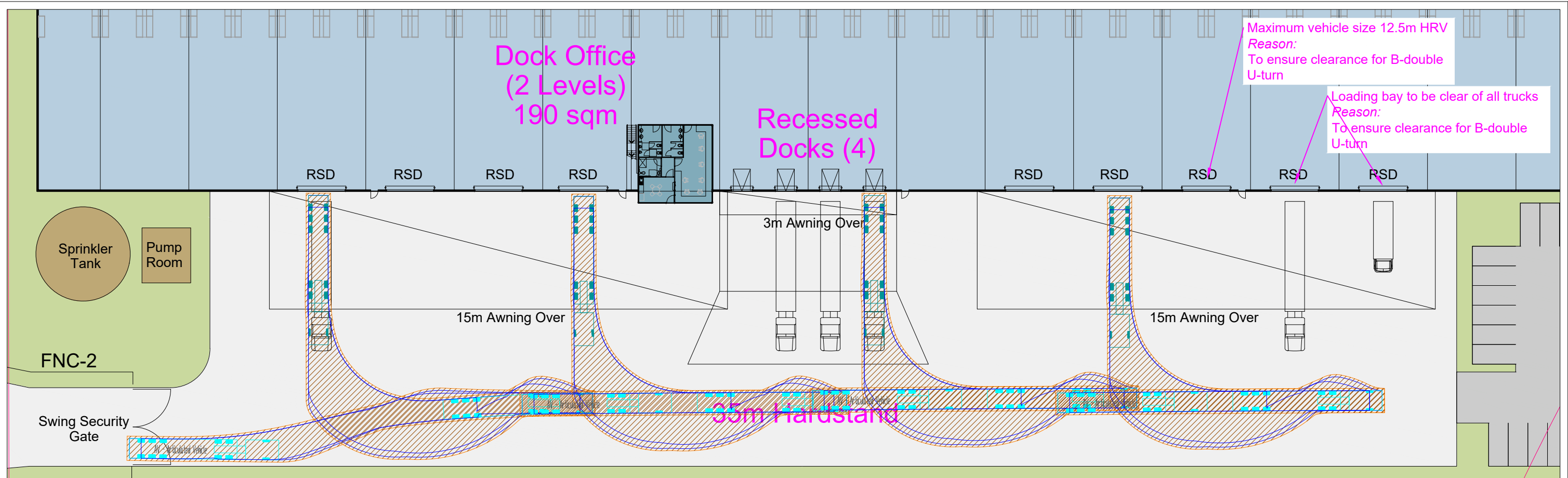




<b>Notes:</b> This drawing is provided for information purposes only and should not be used for construction.		<b>Document Info:</b> Drawn by: Shihui Hu File name: 0129d03 Stage 1 - OWE.dwg	<b>Project:</b> 0129 Oakdale West Estate (1A)	<b>Date:</b> 24-Sep-18	<b>asongroup</b>  Suite 1202, Level 12, 220 George Street Sydney NSW 2000 info@asongroup.com.au
		<b>Client:</b> Goodman Property Service (Aust) PTY LTD	<b>Drawing Title:</b> 26m B-double U-turn	<b>Scale @ A3:</b> 1:300	
				<b>Drawing Number:</b> AG02	



<p>Notes:</p> <p>This drawing is provided for information purposes only and should not be used for construction.</p>	<p>Document Info:</p> <p>Drawn by: Shihui Hu</p> <p>File name: 0129d03 Stage 1 - OWE.dwg</p> <p>Client:</p> <p>Goodman Property Service (Aust) PTY LTD</p>	<p>Project:</p> <p>0129</p> <p>Oakdale West Estate (1A)</p> <p>Drawing Title:</p> <p>Fire Truck (HRV)</p> <p>Circulation</p>	<p>Date:</p> <p>24-Sep-18</p> <p>Scale @ A3:</p> <p>1:650</p> <p>Drawing Number:</p> <p>AG03</p>	<p><b>asongroup</b></p> <p>Suite 1202, Level 12, 220 George Street Sydney NSW 2000</p> <p>info@asongroup.com.au</p>
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Notes:

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**Document Info:**  
 Drawn by: Shihui Hu  
 File name: 0129d03 Stage 1 - OWE.dwg

**Client:**  
 Goodman Property Service (Aust) PTY LTD

**Project:**  
 0129  
 Oakdale West Estate (1A)

**Drawing Title:**  
 19m Articulated Vehicle  
 Access Loading Dock

**Date:**  
 24-Sep-18

**Scale @ A3:**  
 1:500

**Drawing Number:**  
 AG04

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 Sydney NSW 2000  
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# Estate Road 02

16080

3.75m Setback  
Landscape  
7.5m Setback  
Building

Swing Security  
Gate

Truck  
Entry / Exit

B-Double (26.0m)

FNC-2

Pump  
Room

Sprinkler  
Tank

FNC-2

# Estate Road 02

16080

3.75m Setback  
Landscape  
7.5m Setback  
Building

Swing Security  
Gate

Truck  
Entry / Exit

B-Double (26.0m)

FNC-2

Pump  
Room

Sprinkler  
Tank

FNC-2

## Notes:

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## Document Info:

Drawn by: Shihui Hu  
File name: 0129d03 Stage 1 - OWE.dwg

## Client:

Goodman Property Service (Aust) PTY LTD

## Project:

0129  
Oakdale West Estate (1B)

## Drawing Title:

26m B-double  
Site Access - Ingress & Egress

## Date:

24-Sep-18

## Scale @ A3:

1:300

## Drawing Number:

AG05

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# FNC-1

35m Hardstand

5m Awning Over

3m Awning Over

15m Awning Over

RSD  
Dock Office  
(2 Levels)  
190 sqm

RSD  
Recessed  
Docks (4)

RSD

RSD

Maximum vehicle size 8.8m MRV  
Reason:  
To ensure clearance for B-double  
U-turn

cess

## Notes:

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## Document Info:

Drawn by: Shihui Hu  
File name: 0129d03 Stage 1 - OWE.dwg

## Client:

Goodman Property Service (Aust) PTY LTD

## Project:

0129  
Oakdale West Estate (1B)

## Drawing Title:

26m B-double  
U-turn

## Date:

24-Sep-18

## Scale @ A3:

1:300

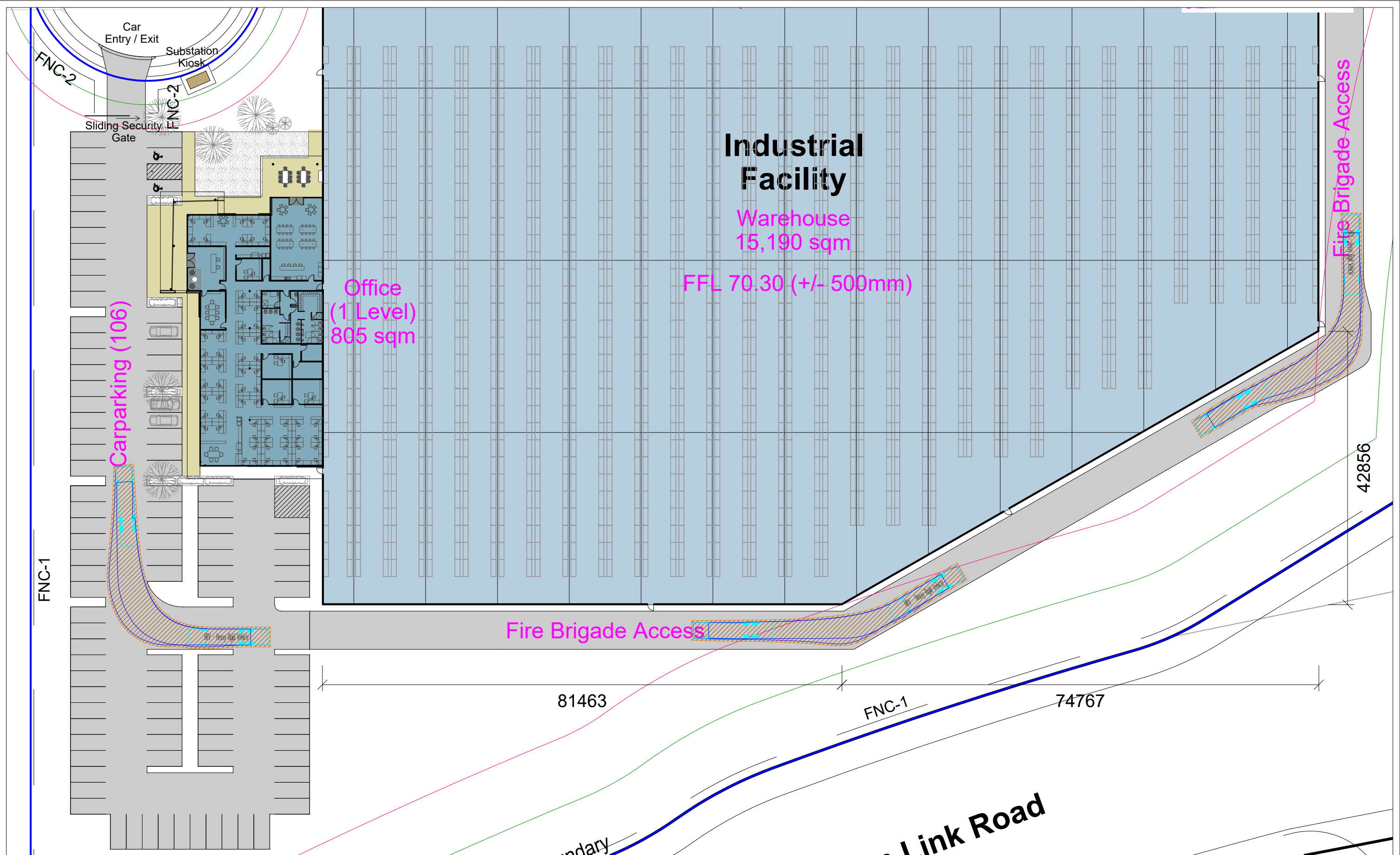
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AG06

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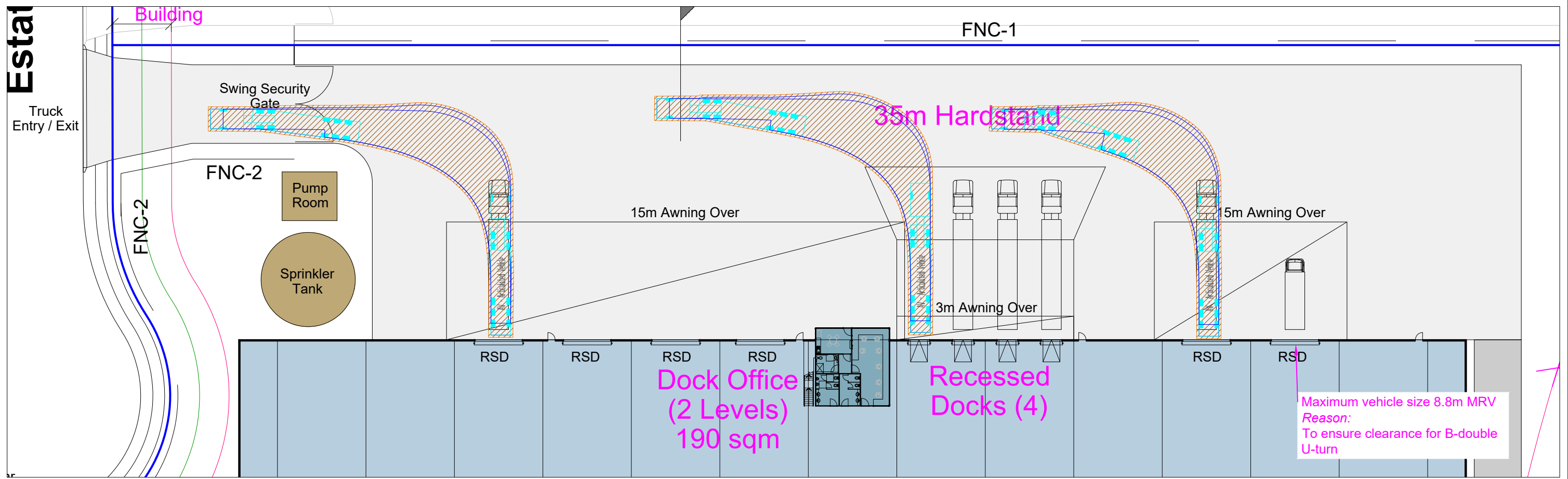
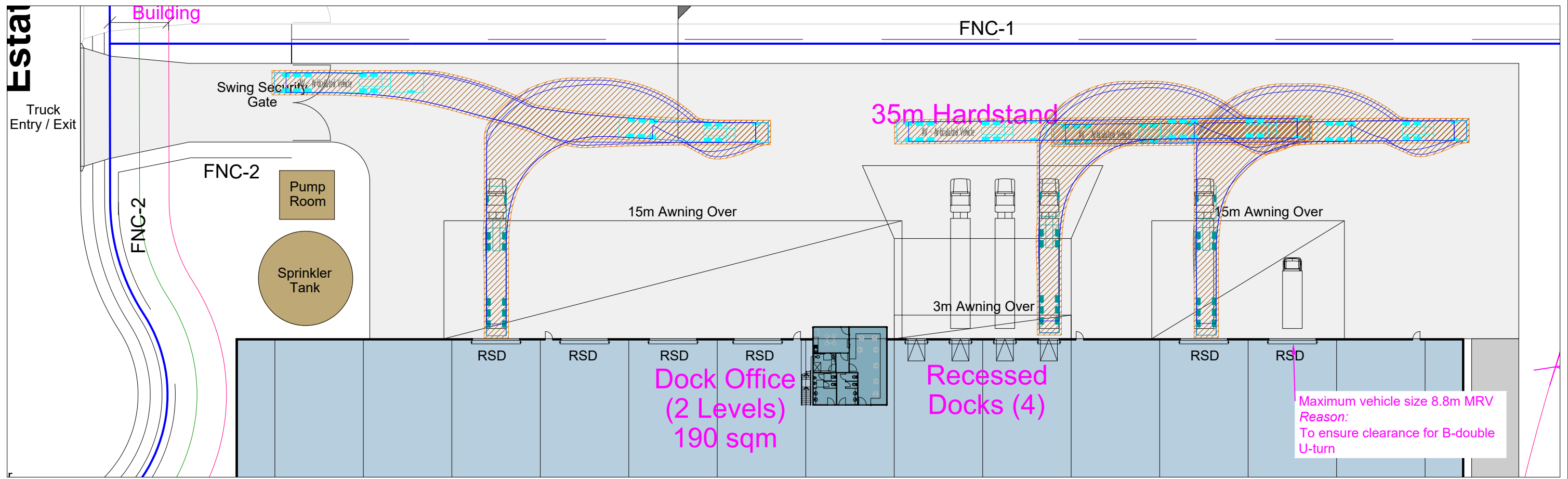
Suite 1202, Level 12, 220 George Street  
Sydney NSW 2000

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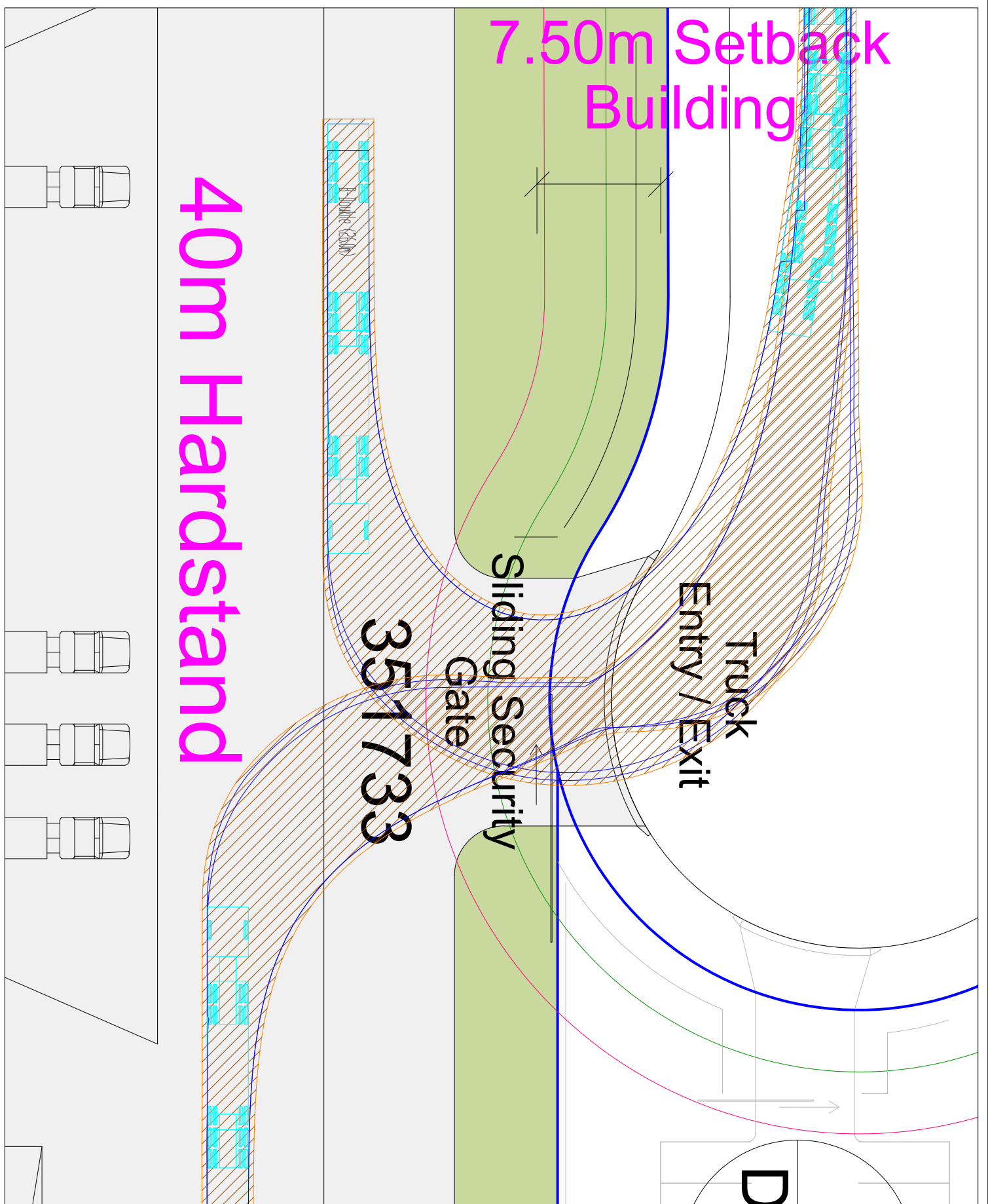
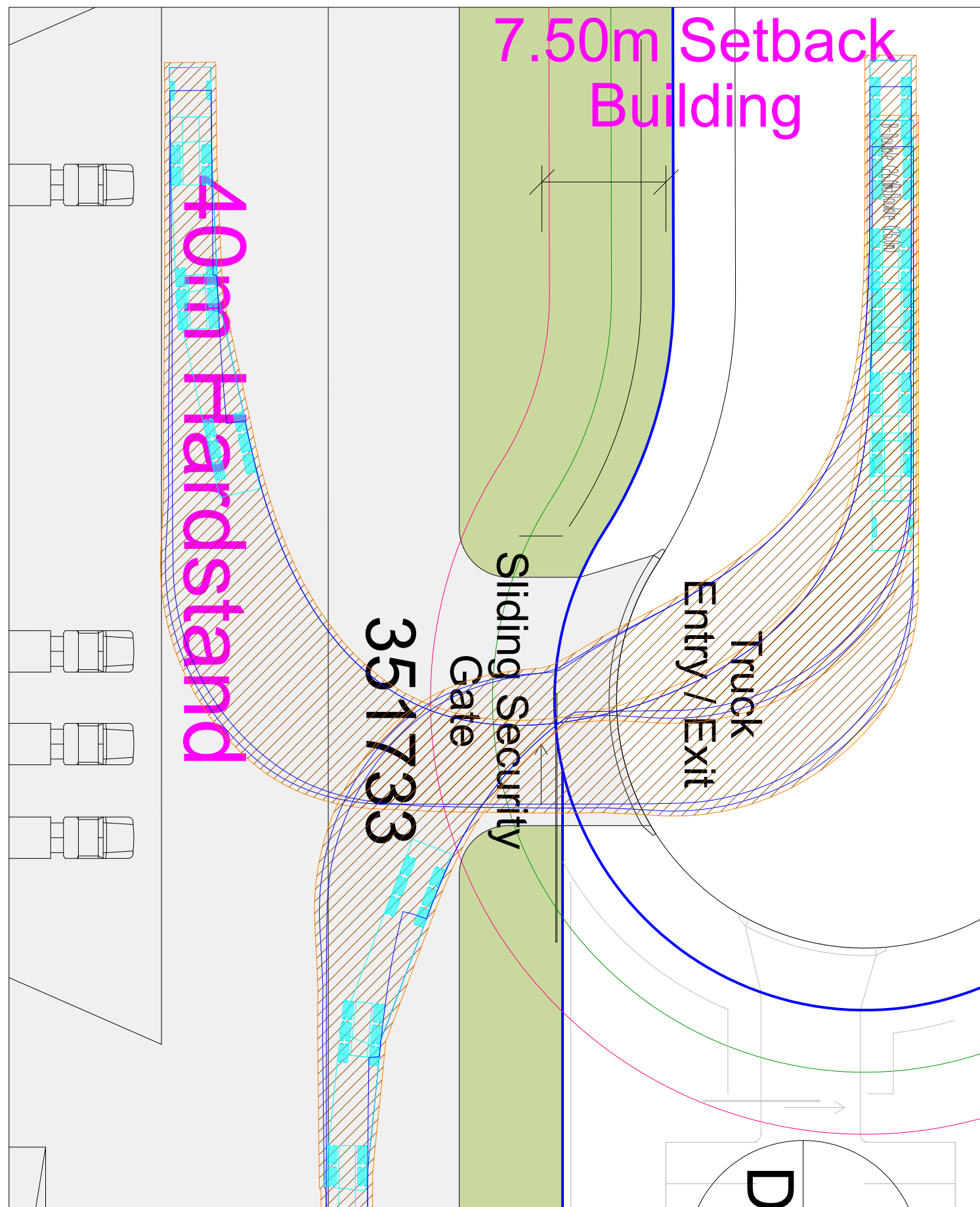



<b>Notes:</b> This drawing is provided for information purposes only and should not be used for construction.		<b>Document Info:</b> Drawn by: Shihui Hu File name: 0129d03 Stage 1 - OWE.dwg	<b>Project:</b> 0129 Oakdale West Estate (1B)	<b>Date:</b> 24-Sep-18	  Suite 1202, Level 12, 220 George Street Sydney NSW 2000 info@asongroup.com.au
		<b>Client:</b> Goodman Property Service (Aust) PTY LTD	<b>Drawing Title:</b> Fire Truck (HRV) Circulation	<b>Scale @ A3:</b> 1:550	
				<b>Drawing Number:</b> AG07	

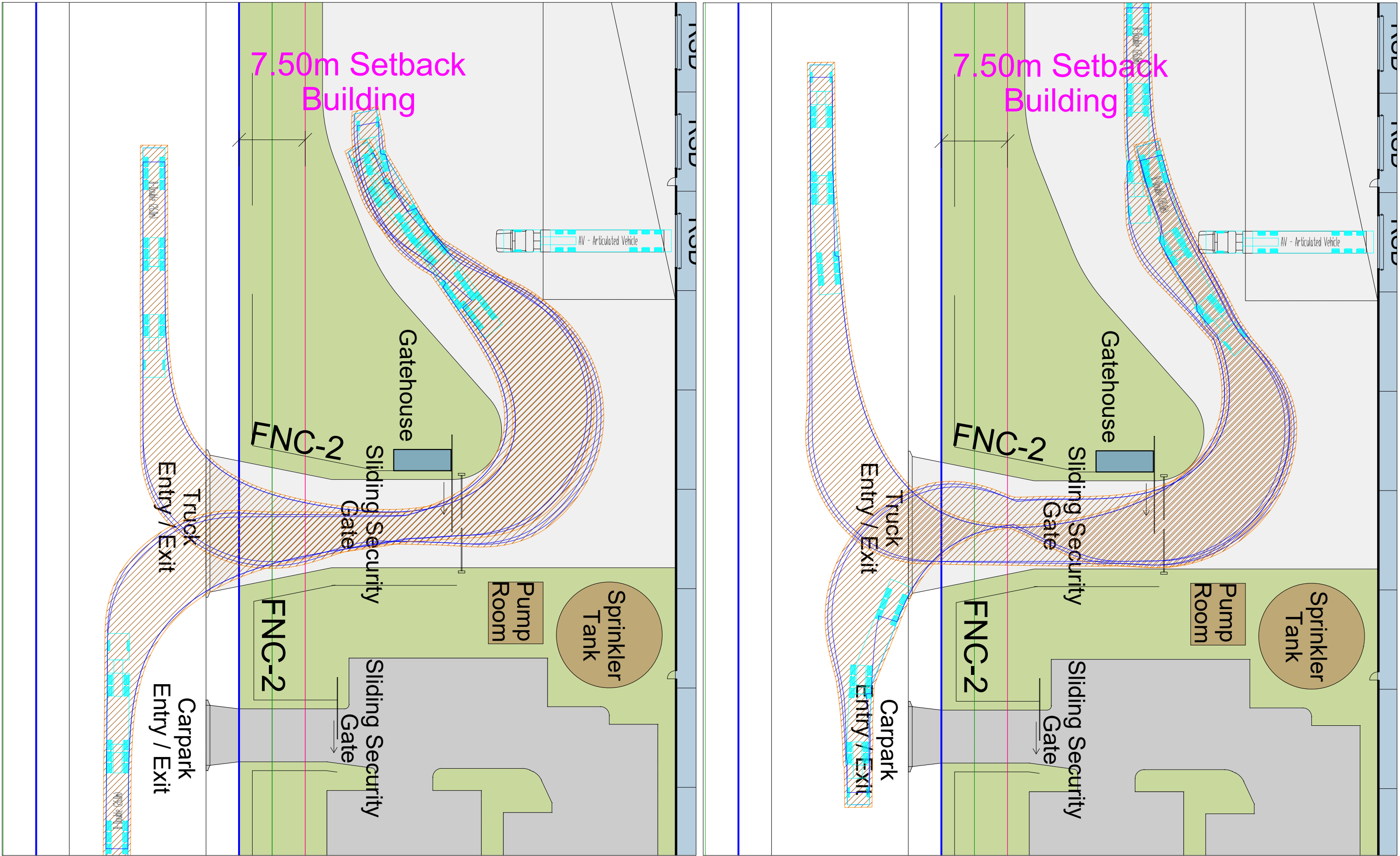




<p><b>Notes:</b></p> <p>This drawing is provided for information purposes only and should not be used for construction.</p>	<p><b>Document Info:</b></p> <p>Drawn by: Shihui Hu File name: 0129d03 Stage 1 - OWE.dwg</p> <p><b>Client:</b></p> <p>Goodman Property Service (Aust) PTY LTD</p>	<p><b>Project:</b></p> <p>0129 Oakdale West Estate (1B)</p> <p><b>Drawing Title:</b></p> <p>19m Articulated Vehicle Access Loading Dock</p>	<p><b>Date:</b></p> <p>24-Sep-18</p> <p><b>Scale @ A3:</b></p> <p>1:500</p> <p><b>Drawing Number:</b></p> <p>AG08</p>	<p><b>asongroup</b></p> <p>Suite 1202, Level 12, 220 George Street Sydney NSW 2000 info@asongroup.com.au</p>
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		<b>Client:</b> Goodman Property Service (Aust) PTY LTD	<b>Drawing Title:</b> 26m B-double Site Access - Ingress & Egress	<b>Scale @ A3:</b> 1:300	
				<b>Drawing Number:</b> AG09	



Notes:

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Document Info:

Drawn by: Shihui Hu

File name: 0129d03 Stage 1 - OWE.dwg

Client:

Goodman Property Service (Aust) PTY LTD

Project:

0129

Oakdale West Estate (1C)

Drawing Title:

26m B-double

Site Access - Ingress & Egress

Date:

24-Sep-18

Scale @ A3:

1:400

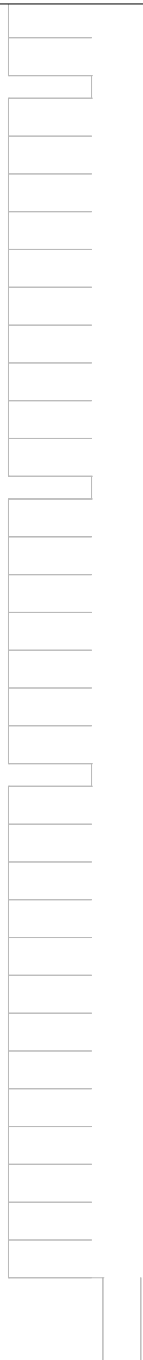
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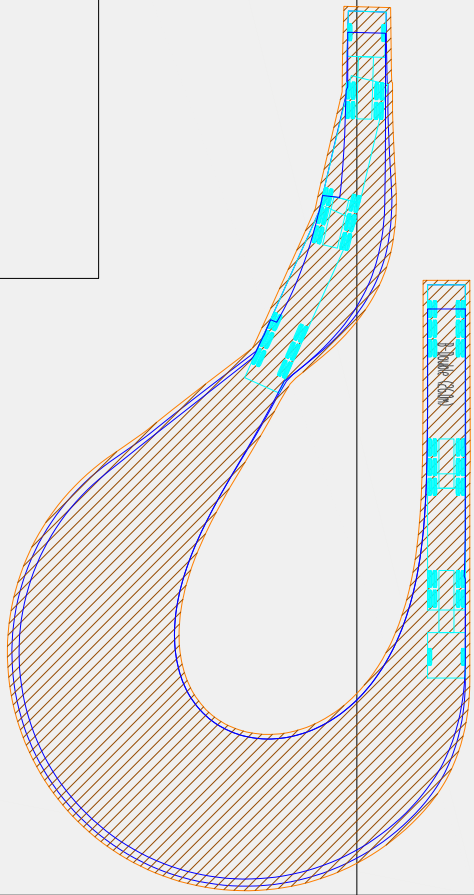
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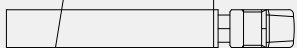




FNC-1



15m Awning Over



RSD

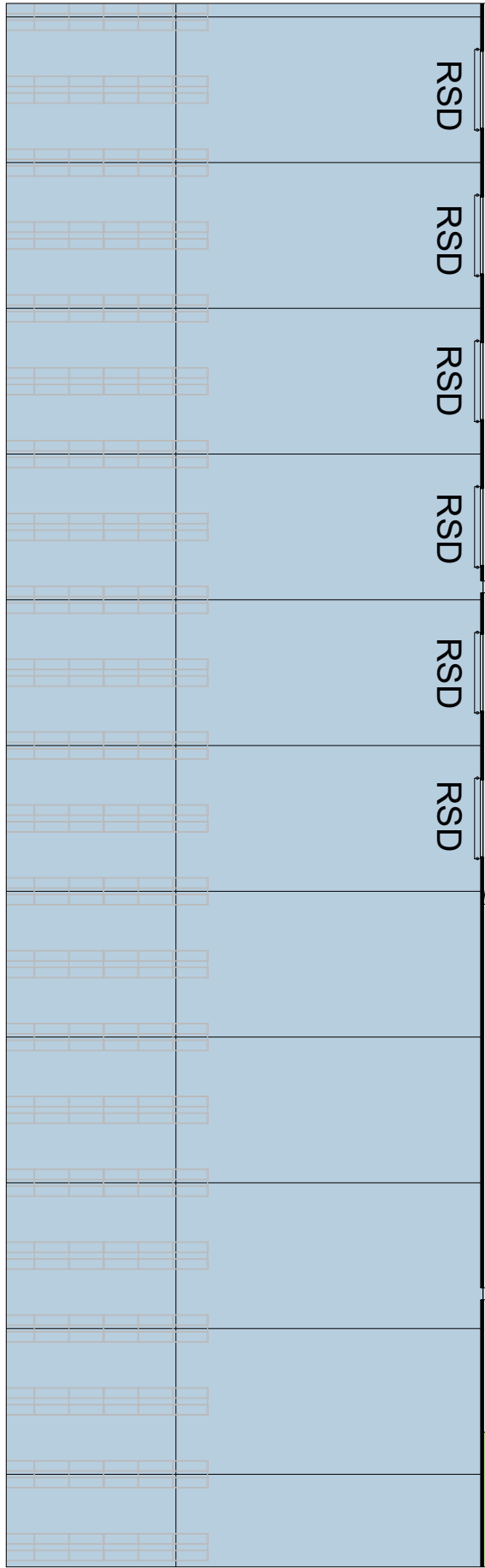
RSD

RSD

RSD

RSD

RSD



# Estate Road 02

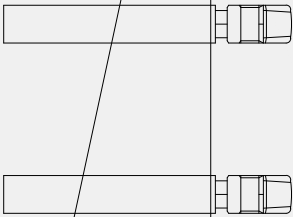
Boundary

FNC-2

21439



15m Awning Over



RSD

RSD

RSD

RSD

RSD

F

Dock Offi  
(2 Levels)  
190 sqn

Notes:

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Document Info:

Drawn by: Shihui Hu  
File name: 0129d03 Stage 1 - OWE.dwg

Client:

Goodman Property Service (Aust) PTY LTD

Project:

0129  
Oakdale West Estate (1C)

Drawing Title:

26m B-double  
U-turn

Date:

24-Sep-18

Scale @ A3:

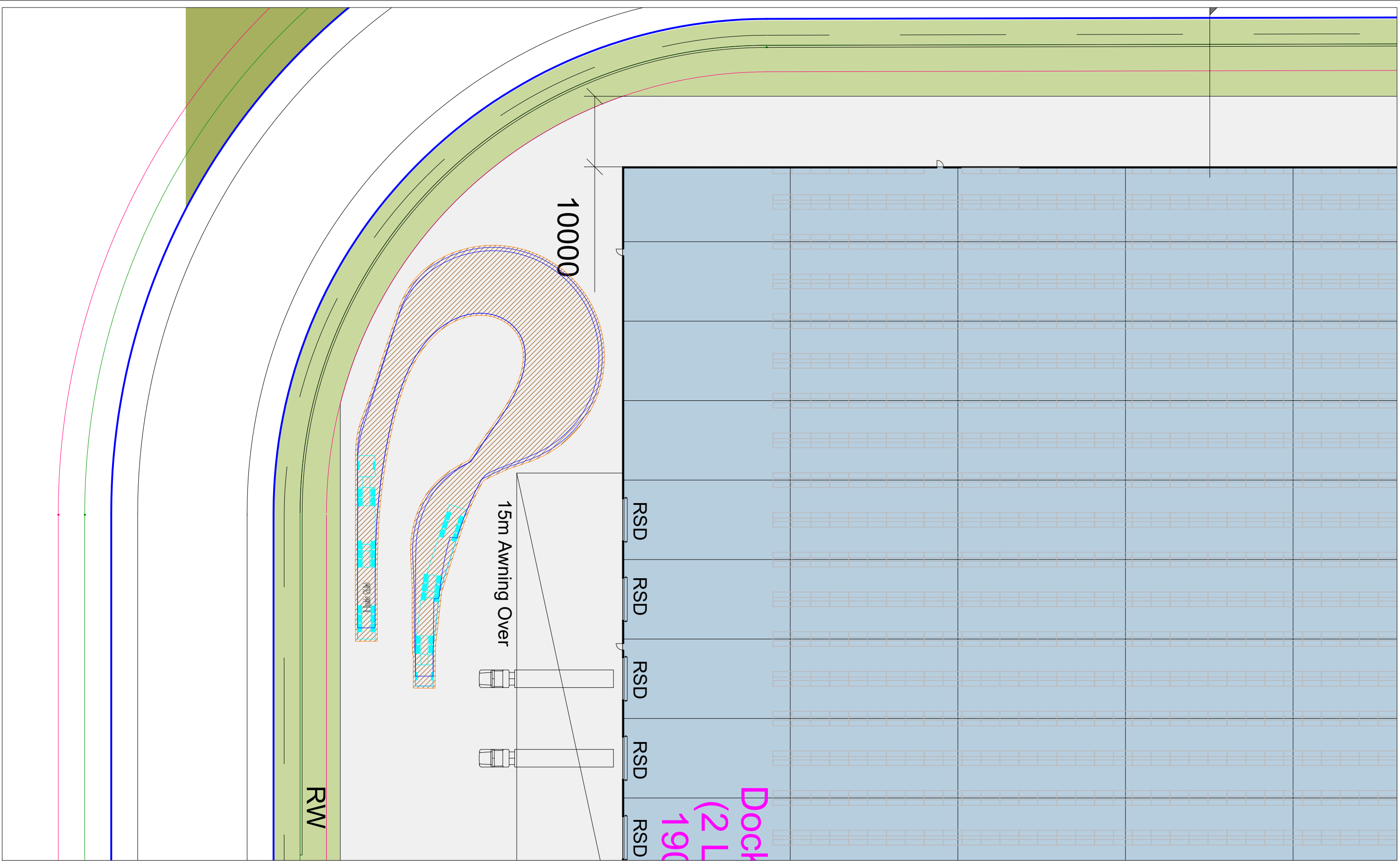
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Drawing Number:

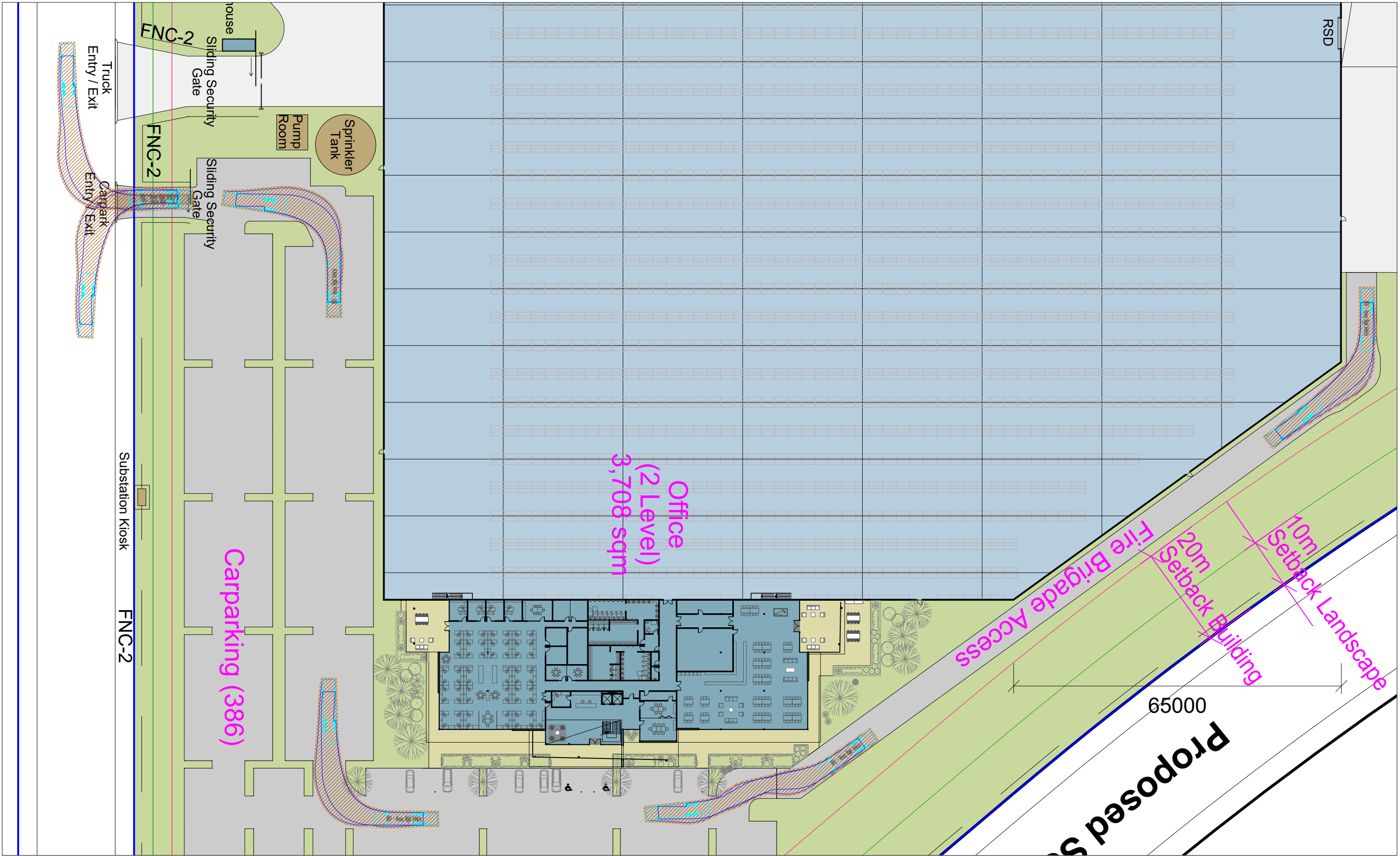
AG11



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info@asongroup.com.au

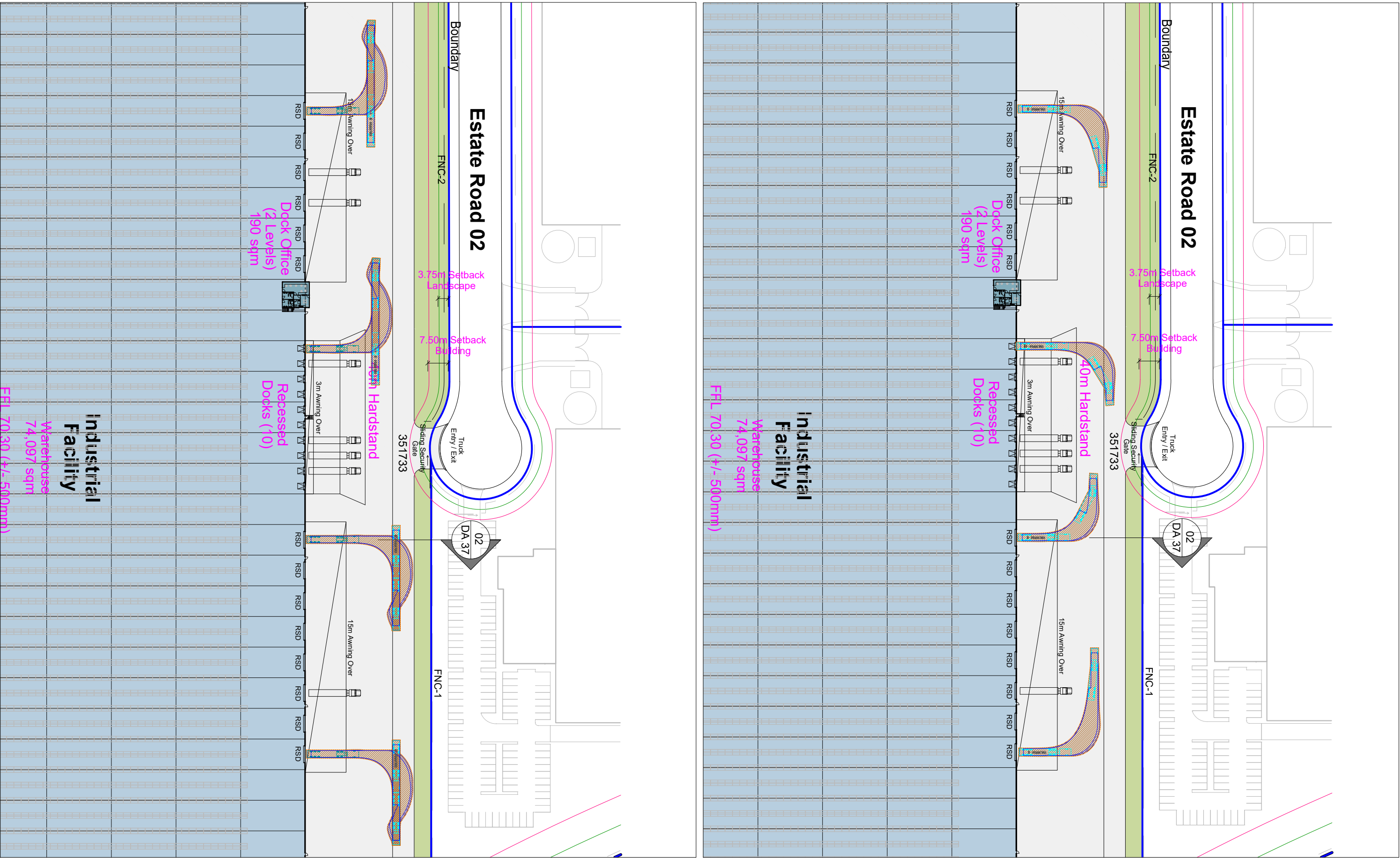


<b>Notes:</b> This drawing is provided for information purposes only and should not be used for construction.		<b>Document Info:</b> Drawn by: Shihui Hu File name: 0129d03 Stage 1 - OWE.dwg	<b>Project:</b> 0129 Oakdale West Estate (1C)	<b>Date:</b> 24-Sep-18	 <b>Suite 1202, Level 12, 220 George Street Sydney NSW 2000</b> <a href="mailto:info@asongroup.com.au">info@asongroup.com.au</a>
		<b>Client:</b> Goodman Property Service (Aust) PTY LTD	<b>Drawing Title:</b> 26m B-double U-turn	<b>Scale @ A3:</b> 1:500	
				<b>Drawing Number:</b> AG12	



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		<b>Client:</b> Goodman Property Service (Aust) PTY LTD		<b>Drawing Title:</b> Fire Truck (HRV) Circulation		<b>Scale @ A3:</b> 1:700	
						<b>Drawing Number:</b> AG13	
						<b>asongroup</b> Suite 1202, Level 12, 220 George Street Sydney NSW 2000 info@asongroup.com.au	





Notes:

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Drawn by: Shihui Hu

File name: 0129d03 Stage 1 - OWE.dwg

Client:

Goodman Property Service (Aust) PTY LTD

Project:

0129

Oakdale West Estate (1C)

Drawing Title:

Access Loading Dock

Site Access - Ingress & Egress

Date:

24-Sep-18

Scale @ A3:

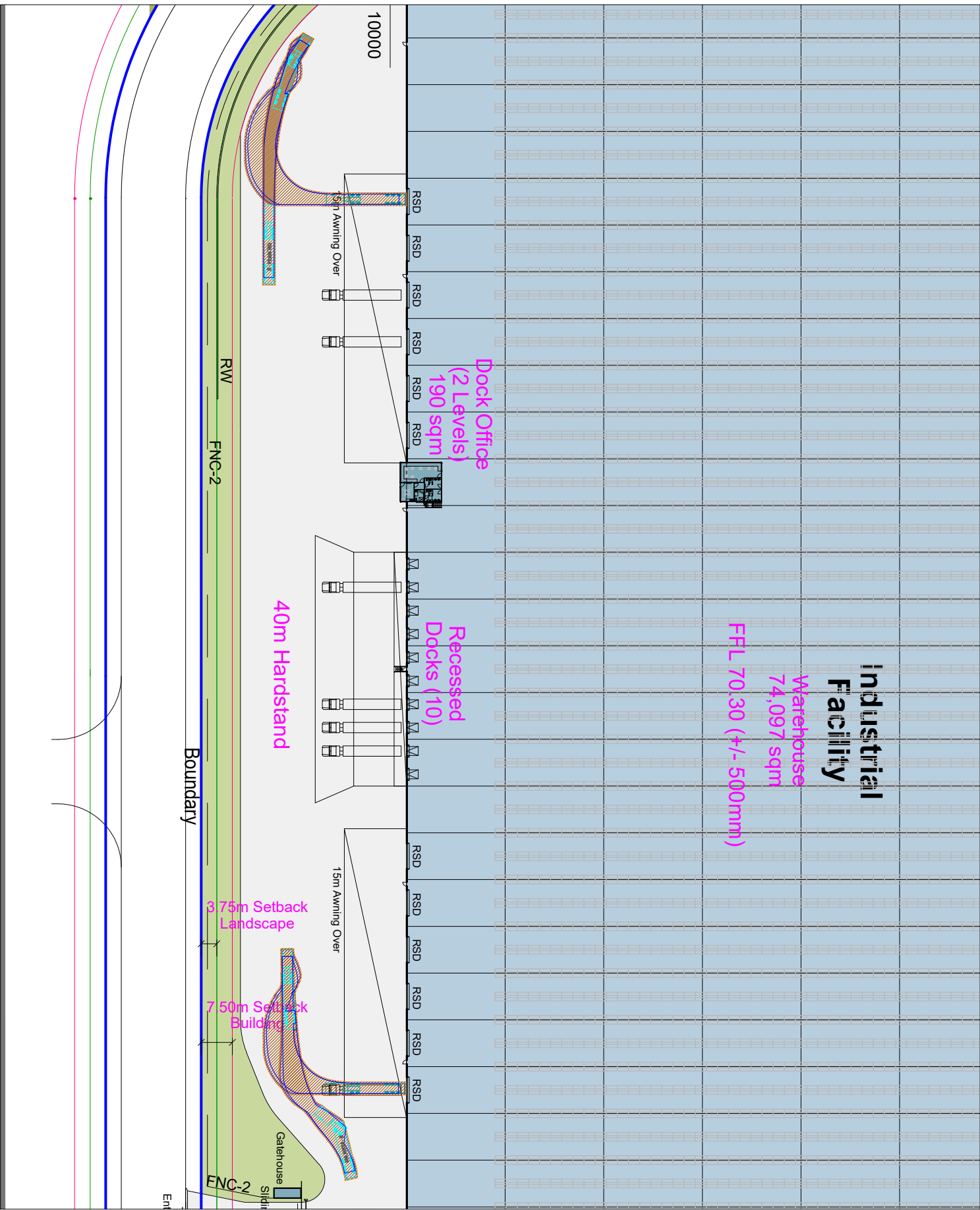
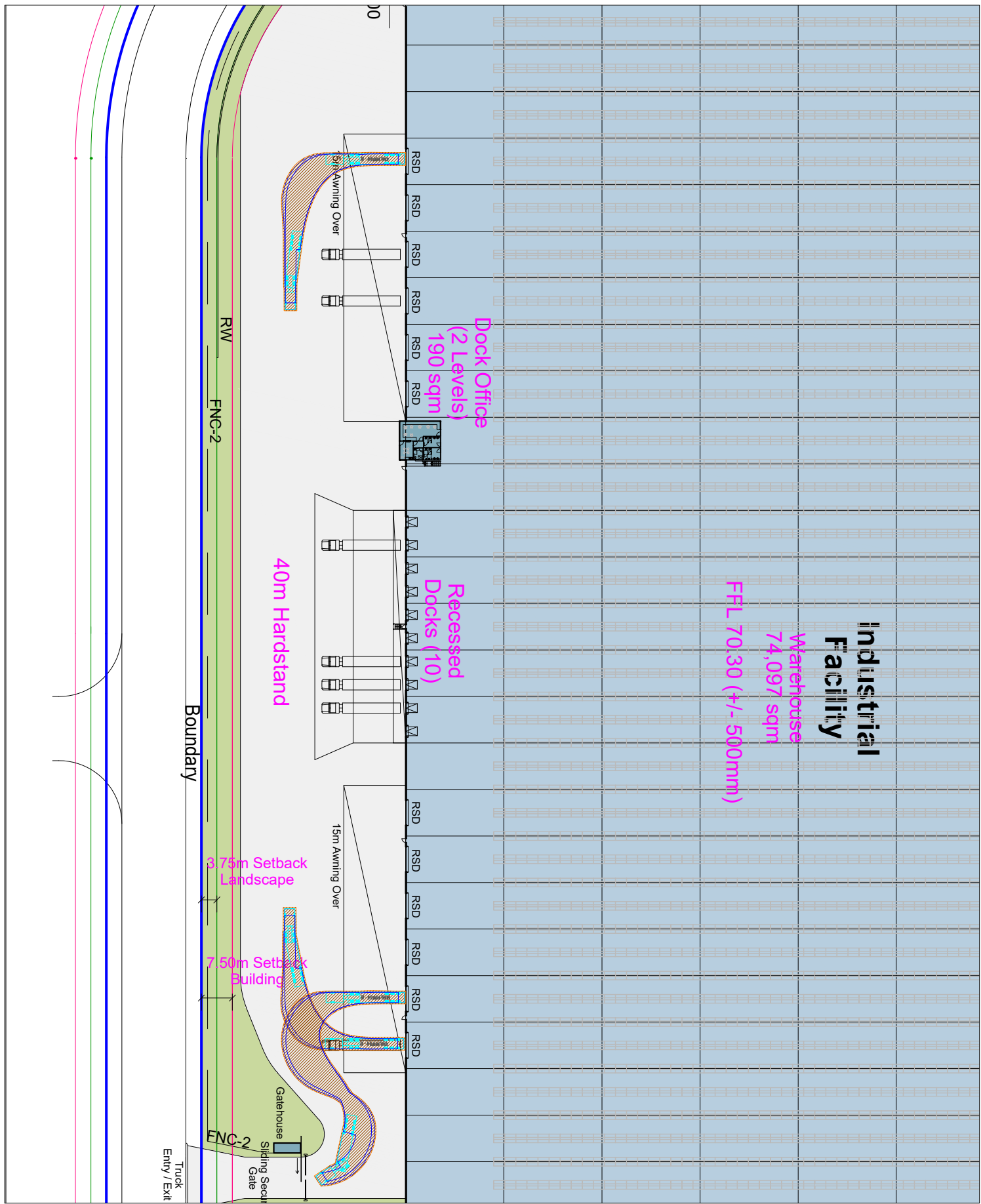
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Drawing Number:

AG14

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Document Info:	Drawn by: Shihui Hu
	File name: 0129d03 Stage 1 - OWE.dwg
Client:	Goodman Property Service (Aust) PTY LTD

Project:	0129
	Oakdale West Estate (1C)
Drawing Title:	Access Loading Dock
	Site Access - Ingress & Egress

Date:	24-Sep-18
Scale @ A3:	1:1200
Drawing Number:	AG15



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Sydney NSW 2000  
info@asongroup.com.au