



# traffic impact assessment

**Central Concept Plan No. 1 and DHL Project Application No.1, lot 2 in  
DP120673 estate rd, horsley park – section 75W modifications**

prepared on behalf of goodman international by **TRAFFIX** traffic & transport planners  
ref: 10 097 v3 september 2010

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# 1. introduction

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TRAFFIX has been commissioned by Goodman International to undertake a traffic impact assessment in support of modifications to Concept Plan Application (CP No.1) relating to the development of the Central 1 Area (the northern part of the Central Area); and a Project Application (PA No.1) relating to the development of a DHL Transport Facility located at Lot 2, DP 120673 (the eastern part of the Central 1 Area). The overall development lands are located within the Fairfield Council LGA and the applications to modify the current consents have been assessed under that council's controls; as well as having regard for the requirements of the RTA's Guide to Traffic Generating Developments where appropriate.

This report documents the findings of our investigations and should be read in the context of the Oakdale Concept Plan previously approved in 2008; as well as the Environmental Assessment Report prepared separately for the Project Application No. 1.



## 2. oakdale central concept plan modifications

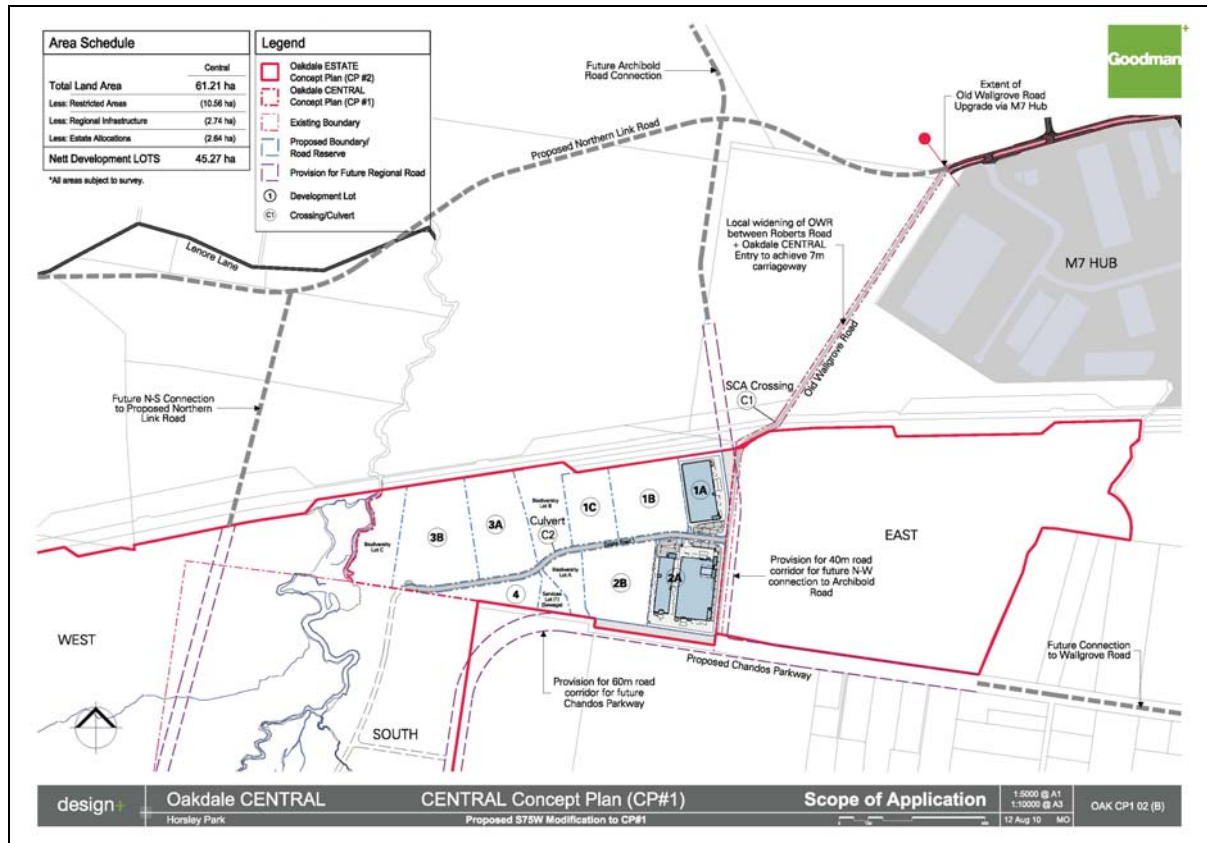
The Concept Plan 1 for the Central 1 Area incorporates a site area of 27.45 hectares. It forms part of the Oakdale Central Concept Plan already approved, which was the subject of a Traffic Impact Assessment prepared by TRAFFIX, dated February 2008.

The only significant amendments to the approved Oakdale Central Concept Plan under the current CP No. 1 modifications are that the road network in the locality has now been more highly developed. Specifically, the current preferred road hierarchy incorporates:

- ➡ Provision for a 40m wide corridor along the alignment of Old Wallgrove Road (the eastern boundary of CP1) which is intended to be extended to the north to connect to Archibald Road;
- ➡ Provision of a 60m corridor for the east-west arterial (Chandos Parkway) which forms the southern boundary of CP1; and
- ➡ Deletion of the road corridor adjacent to the Sydney Water Supply Pipeline which was expected to connect to a new east-west arterial road corridor to the south of the Oakdale Concept Plan areas.

The resultant road hierarchy is shown in the following figure, which is also reproduced in **appendix b** for ease of reference. A photographic record is also provided in **appendix a**, which provides an appreciation of traffic conditions in the locality.





It is expected that the traffic generation associated with the CP1 area will remain unchanged from the levels assumed in the original Oakdale Central Concept Plan report. The main changes will be the need to construct 'T' junctions at the intersections of:

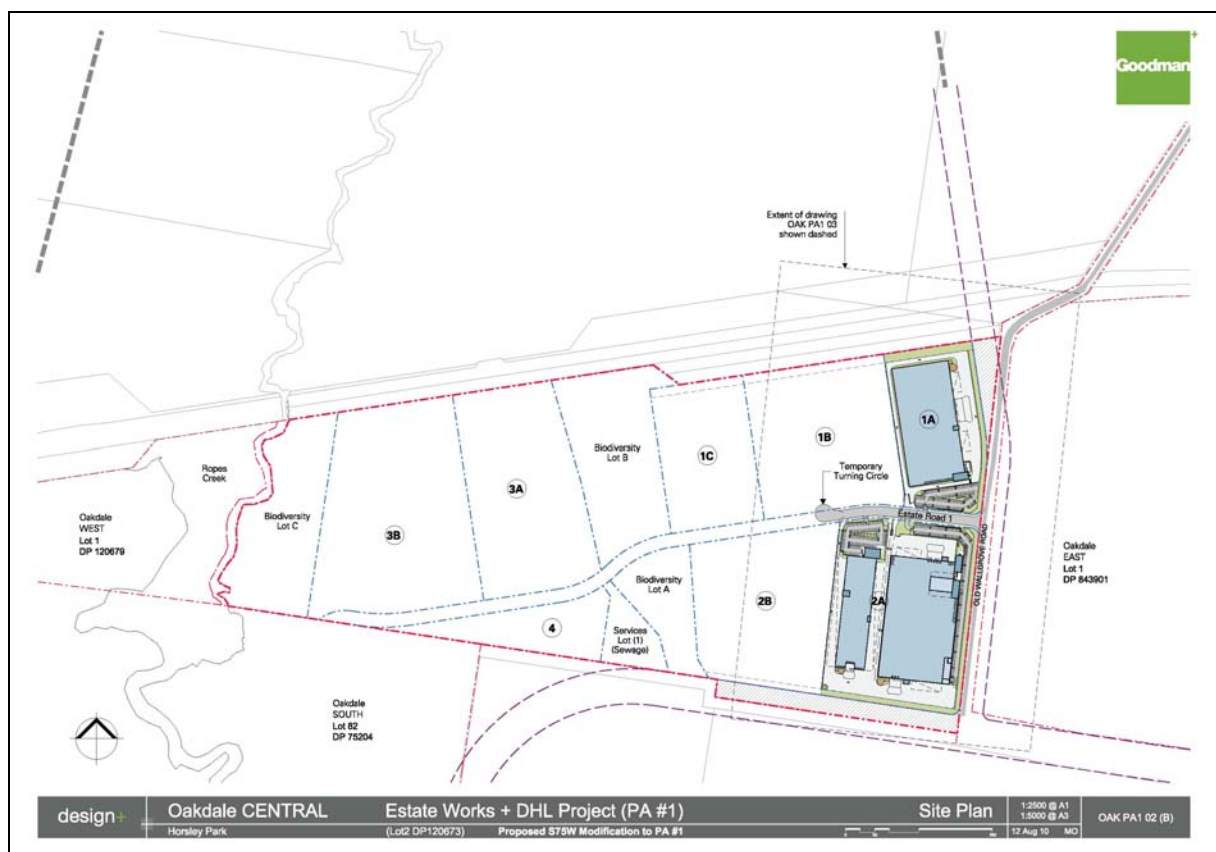
- ➡ Old Wallgrove Road with the new north-south connection between Archibold Road and the Chandos parkway; and
- ➡ Old Wallgrove Road with the proposed Chandos Parkway.

These intersections will be able to be constructed within the road reservations that have been provided and accordingly, the CP1 lands are able to be developed subject to appropriate staged road and intersection upgradings. The extent of upgrading is able to be assessed at Project Application Stage/s.



### 3. project application no.1 modifications

The Project Application 1 development has a floor area of 56,061m<sup>2</sup> with 381 parking spaces and requires referral to the RTA under the provisions of SEPP (Infrastructure) 2007. The PA1 development site is shown in the following figure which is also reproduced in **appendix b**.



The site comprises Site 1A and Site 2A which lie on the eastern boundary of the Oakdale Central area. The site was the subject of a previous Oakdale Central Stage 1 Project Application that was prepared by TRAFFIX, dated May 2008. In this regard, the access principles have been revised to reflect the altered road hierarchy discussed above. The implications of the development are discussed in the following sections.



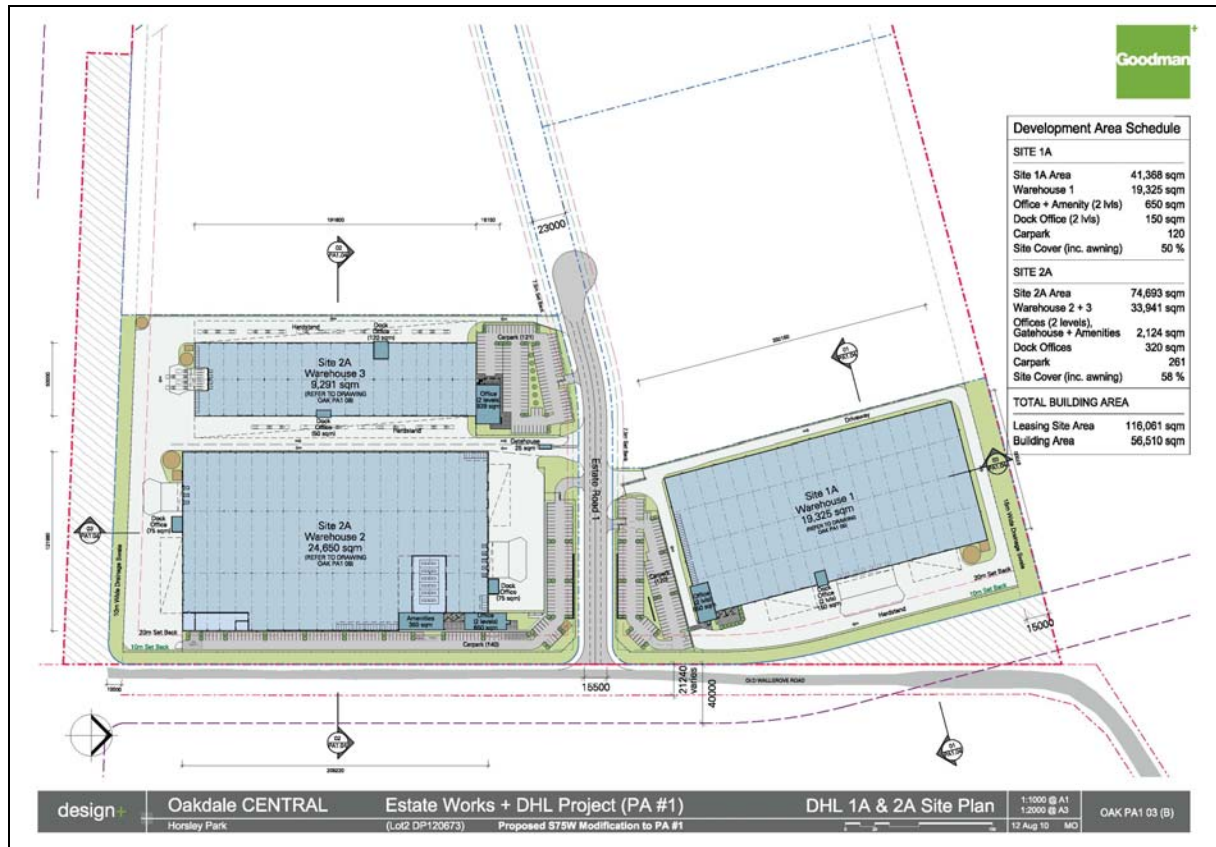
### 3.1 location and site

The site is located within the south-western part of the Eastern Creek Precinct Plan area, to the west of Wallgrove Road along Old Wallgrove Road, immediately south of the Sydney Water Supply Pipeline. It is located within the eastern part of the Oakdale Central Concept Plan area, to the south-west of the existing alignment (and termination) of Old Wallgrove Road. It is therefore to the immediate south west of the M7 Business Hub. The site is within Area 8 of the 656ha site identified as the “Area South of the Sydney Water Pipeline” which forms one of the 10 sites that comprise the Western Sydney Employment Hub. It is the last of these development areas to proceed.

The site that is the subject of this Project Application occupies a total site area of 11.6ha with a total floor area of 56,510m<sup>2</sup> and has its main eastern frontage to Old Wallgrove Road which will ultimately be widened within a 40 metre road reserve, to connect to the proposed Chandos Parkway which in turn will provide an east-west arterial link between Wallgrove Road (and the M7) in the east; and Mamre Road in the west. The opportunity for such a link was also discussed in the Oakdale Central Concept Plan Application, with the intention at that time to divert Old Wallgrove Road along the northern site boundary, which is no longer proposed.

For the purpose of this PA1, reliance is to be made on access via Old Wallgrove on its existing alignment to connect to Wallgrove Road. Hence, all entry and exit movements will occur via right turn entries and left turn exits onto Old Wallgrove Road, connecting to Wallgrove Road and the M7 Sydney Orbital. The minor subdivisional road that traverse between Sites 1 and 2 will also be constructed, terminating in a cul-de-sac to the immediate west of these sites.

The site layout is depicted in the following figure and is also reproduced in **appendix c**.



### 3.2 existing traffic conditions

The site is presently only accessible via Old Wallgrove Road to/from the north-east of the site across the Sydney Water Supply Pipeline. This is presently a single lane carriageway in each direction between the site and Roberts Road and this section will need to be upgraded as discussed further below.

Old Wallgrove Road forms a signal-controlled intersection with Wallgrove Road to the north-east of the site. As this is the most critical intersection in the network in relation to the site access, surveys were undertaken during both peak periods in August 2010, between 7-9am and 4-6pm. The results of these surveys were analysed for the times of maximum traffic volumes over the period surveyed,





which was 8-9am and 4-5pm. The results of these surveys were analysed using the SIDRA computer program to determine their performance characteristics under existing traffic conditions. The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DOS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LOS) criteria. These performance measures can be interpreted using the following explanations:

**DOS** - the DOS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DOS approaches 1, it is usual to attempt to keep DOS to less than 0.9. When DOS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DOS of 0.8 or less.

**AVD** - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

**LOS** - this is a comparative measure which provides an indication of the operating performance of an intersection as shown below:

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 and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.



A summary of the modelled results are provided below. Reference should also be made to the SIDRA outputs provided in **appendix d** which provide detailed results for individual lanes and approaches.

**table 1: existing intersection performance: am and pm peak hour**

Intersection Description	Period	Control Type	Degree of Saturation	Intersection Delay	Level of Service
Wallgrove Road and Old Wallgrove Road	AM	signals	1.046	48.6	D
	PM		1.204	65.6	E

It can be seen from Table 1 that the intersection operates at capacity under the existing 'base case' scenario, with a level of service D during the morning peak and E during the PM peak. Nevertheless, it is stressed that the most relevant use of this analysis is to compare the relative change in the performance parameters as a result of the proposed development. This is discussed further below.

### 3.3 description of proposed development

A detailed description of the proposed development is provided in the Project Application Report prepared on behalf of Goodman International. This is based on the plans prepared by Goodman International dated 4<sup>th</sup> April 2008 which are reproduced at reduced scale in **Appendix A**. In summary, the development for which approval is now sought has a total building area of 53,350m<sup>2</sup>, as follows: These will all operate 24 hours per day, 7 days per week.

Site 1A (The DHL Facility – Warehouse 1)

- ➡ 19,325m<sup>2</sup> of warehouse area;
- ➡ 800m<sup>2</sup> of ancilliary office and dock office area; and
- ➡ 120 parking spaces;



#### Site 2A (Warehouse 2)

- 33,941m<sup>2</sup> of warehouse area;
- 2,424m<sup>2</sup> of office area, gatehouse area and dock office area; and
- 261 parking spaces;

A total of 381 parking spaces are proposed. All access to the overall site is via a staged central estate road as shown above and also in **appendix c**. This includes the construction of a temporary cul-de-sac (turning head) to the west of the site boundary that lies within the future link estate road corridor as depicted in the Oakdale Central CP1 Application. This will be constructed to a standard that will enable the future development of the balance of the Oakdale Central Project area, within a road reservation of width 23 metres.

This road traverses between Sites 1A and 2A. Access is proposed by 25m long B Doubles to both warehouse buildings.

It is emphasised that the total office space for the overall development is 3,244m<sup>2</sup> which represents 5.7% of the total floor area. This is substantially below the 20% limit for ancillary office area within an industrial development.

The traffic and parking impacts arising from the development are discussed in the following sections. Reference should be made to the plans submitted separately to the Department of Planning which are presented at reduced scale in **appendix c**.

### 3.4 parking requirements

The requirements of Fairfield Council's City Wide DCP (Chapter 12) have been reviewed as well as the rates embodied in the RTA's document entitled "Guide to Traffic Generating Developments." The application of Council and RTA parking rates to the proposed development under the Project Application results in parking requirements as shown in Table 2.



**table 2: comparative parking requirements**

Site	Area (m <sup>2</sup> )	Council DCP Requirement		RTA Guideline Requirement	
		Rate	Spaces	Rate	Spaces
	Warehouse	1/80m <sup>2</sup>		1/300m <sup>2</sup>	
	Office	1/70m <sup>2</sup>		1/300m <sup>2</sup>	
1A	19,325		242		
	800		11		
	20,125		253		67
2A	33,941		424		
	2,424		34		
	36,385		458		121
Total Warehouse	53,266				
Total Office	3,224				
TOTAL	56,510	56,510	711		188

It can be seen that the development would require between 188 spaces based on the RTA's requirements and 711 spaces if based on Council's DCP requirement. It is noted that the above parking rates are 'generic' rates that are averaged across the LGA/metropolitan area and do not take due account of the particular requirements of specific tenants or the wide variation in surveyed parking demands for industrial uses. Accordingly, a significant degree of flexibility is required.

In this regard, the plans incorporate 381 spaces (120 for Site 1A and 261 for Site 2A) which are substantially more than the RTA's requirement which demonstrates that all parking demands will be fully accommodated within the site. Application of Council's rate is considered excessive and is not considered representative of a modern distribution facility. The provision of reduced rates is also likely to contain travel by private car more effectively, thereby achieving the Director General's requirements. Finally, in relation to the DHL facility on Site 2A, the parking provision is commensurate with expected demands.

### 3.5 disabled parking

Site 1A, with 120 parking spaces, is provided with two disabled spaces immediately adjacent to the main office. Site 2A, with 261 parking spaces, is provided with three disabled parking spaces, also



adjacent to the main office. These spaces represent 1-2% of all parking and this is consistent with the requirements of AS 2890.1. The disabled spaces are 3.2 metres wide.

### 3.6 motorcycle parking

It is considered that motorcycle parking can occur within the parking spaces provided, as necessary, in accordance with demands.

### 3.7 bicycle facilities

While bicycle parking demands are expected to be minimal in this location, it is recommended that bicycle racks be provided in proximity to the main offices (or space identified for this to be provided). It is also recommended that shower facilities be provided within the amenities areas.

### 3.8 traffic impacts

#### 3.8.1 traffic generation under rta guideline trip rates

The proposed development embodies areas as shown in Table 1 below, with trip rates adopted by the Roads and Traffic Authority for the relevant land use components.

**table 1: traffic generation under rta trip rates (peak periods)**

Floor Space Component	Area (m <sup>2</sup> )	RTA Trip Rate	Trips Per Hour
Free Standing Office <sup>1</sup>	Nil		-
Warehouse <sup>2</sup>	56,510 (100%)	0.5/100m <sup>2</sup>	282
Total	56,510 (100%)		282

Note 1: No Free Standing Office Proposed

Note 2: Includes 3,224m<sup>2</sup> ancillary office areas (5.6% of total area)





It can be seen that a total of 282 vehicle trips per hour would result from application of the Roads and Traffic Authority's 'generic' trip rates; with 80% in the direction of peak flow as follows:

- 282 vehicle trips per hour in the morning peak (226 in, 56 out);
- 282 vehicle trips per hour in the evening peak (56 in, 226 out);

These are comparable to the traffic levels implicit under current approvals. However these are average rates over the metropolitan area and more recent data is available.

### **3.8.2 warehouse distribution trip rates**

The rate of 15 trips per hectare has been generally adopted by the RTA in other comparable locations (including Eastern Creek and the M7 Business Hub), where there is a similar high proportion of warehouse and distribution facilities. The basis of this rate is not fully appreciated but it arguably does not take full account of public transport improvements as would occur if the 10% target set under SEPP 59 was achieved. That is, it is a worst-case scenario which in the long term (pending implementation of public transport initiatives) is likely to overstate the traffic generation arising from Oakdale in general, and the DHL Facility in particular. Application of this rate to the 11.61ha for this development results in the following trips:

- 174 vehicle trips per hour in the morning peak (140 in, 34 out);
- 174 vehicle trips per hour in the evening peak (34 in, 140 out);

These trips are preferred to the RTA's generic rate. In addition, many of the development applications within Erskine Park and the M7 Business Hub have demonstrated trip rates that are lower than 15 trips/ha and this is a direct consequence of the following factors:

- Large warehouse developments typically operate 24 hours per day and 7 days per week, thereby spreading traffic loads and minimising peak period generation;



- Warehouse staff are usually rostered over this 24 hour shift with changeover times that do not generally coincide with the on-street peak period; and
- Peak period travel is usually associated with administrative staff, which is a small proportion of the overall workforce.

Accordingly, the adoption of 164 veh/hr would be considered to represent a worst-case scenario, which is nevertheless appropriate for assessment. With a total of 381 parking spaces, this represents about 0.43 trips/space/hr which is also within the expected range.

### 3.8.3 DHL operational data

The operational requirements of DHL are well known and understood from experience, having regard for its expected staff levels and rosters; as well as truck frequencies over the day. Based on information provided by DHL, the development that is the subject of these modifications will operate with:

- 35 main office staff (8.30am to 5.30pm);
- 16 warehouse office staff (6.00am to 10.00am; and 2.00pm to 9.00pm);
- 43 warehouse staff (4.00am to midday and midday to 10pm);
- 222 truck trips per day on an average day (111 in, 111 out);
- 270 truck trips on a peak day (135 in, 135 out);
- 40 trips per day by couriers and other visitors on an average day (20 in, 20 out); and
- 48 trips per day by couriers and other visitors on a peak day (24 in, 24 out); and

If it is assumed that truck and courier trips occur over a 14 hour period (which is conservative and overestimates hourly volumes), then the site will generate maximum hourly trips as follows on a peak day, assuming that all employees drive and with an average car occupancy of 1.1 persons per car:



- 56 veh/hr between 7.30am and 8.30am (44 in, 12 out); and
- 56 veh/hr between 5.30pm and 6.30pm (12 in, 44 out).

These trips are clearly very moderate and substantially less than the 174 veh/hr assessed above based on historic warehouse data. Having regard for the nature of the specific nature of the DHL facility and the fact that it is purpose-built and with long term occupation, it is proposed to adopt the following trips for assessment purposes, which provides a factored increase of about 50% for sensitivity testing purposes:

- 84 vehicle trips per hour in the morning peak (66 in, 18 out);
- 84 vehicle trips per hour in the evening peak (18 in, 66 out);

#### 3.8.4 impacts of generated traffic

The existing route and intersection performance was assessed in the 2008 Concept Plan Application report and was found to be satisfactory subject to minor improvements. The impact of the Project Application No. 1 on the critical intersection of Old Wallgrove Road with Wallgrove Road has been assessed based on the existing geometry and the results are provided in full **appendix d** and is summarised in **table 2** below.

**table 2: future intersection performance: am and pm peak hour**

Intersection Description	Period	Control Type	Degree of Saturation	Intersection Delay	Level of Service
Wallgrove Road and Old Wallgrove Road	AM	signals	1.233	67.6	E
	PM		1.309	92.7	F

It is evident that the intersection performance deteriorates and this demonstrates the need for improvements as embodied in the RTA's forward planning based on contributions by developers. Importantly the result would be less satisfactory based on the traffic generation that implicit under



current approvals, which has higher assumed trip rates. Hence no additional improvements are required at this intersection beyond those already proposed. The PA1 Application does not therefore depend upon any intersection improvements external to the site. The PA1 development does however require the following improvements and these can be conditioned:

- ➡ The Estate Road serving the Project Application No.1 forms a T junction with Old Wallgrove Road. It is recommended that this intersection incorporate a passing lane for southbound traffic on Old Wallgrove Road having regard for the expected short term peak activity at shift changeover times; as well as its use by B Doubles. It is proposed that a passing bay be provided for southbound traffic to enable passing of vehicles waiting to turn right into the site. This would need to incorporate a 6 metre wide southbound carriageway with appropriate diverge and merge tapers based on the RTA's Road Design Guide. This will require 25 metre long tapers (both sides) with a 40 metre long passing lane, based on Estate Road entry by a 25 metre B Double. This local widening can occur within the proposed 40 metre road reserve and it is noted that this intersection will be upgraded in the long term, in order to deliver the road hierarchy proposed under the Oakdale Concept Plan.
- ➡ Old Wallgrove Road traverse the bridge over the Sydney Water Pipeline and this will need to be designed to accommodate a 7m wide road carriageway. The horizontal and vertical geometry at this bridge will however need to be assessed and improvements only undertaken if they are required to achieve compliance with relevant standards and guidelines, including the RTA's Road Design Guide. This appears to be achievable without widening the existing structure (subject to further detailed assessment); and
- ➡ Old Wallgrove Road will need to be widened to a width of 7 metres between the Estate Road and Roberts Road. Local widening at bends may also be required to safely accommodate B Doubles and this will need to be assessed at the detailed design (cc) stage.

It is noted that with the development, the through movement along Old Wallgrove Road north of the site (between the site and Roberts Road) will be about 120 veh/hr during peak periods including existing traffic which is estimated at 30 veh/hr at peak times (combined flow in both directions). This volume can be readily accommodated by Old Wallgrove Road, which has a mid-block capacity of about 1,200 veh/hr for a single undivided lane under interrupted flow conditions. Therefore a 7.0 metre wide undivided carriageway with one lane in each direction will readily accommodate the traffic generated under the Project Application.



In summary the traffic generated by this Project Application No. 1 can be readily accommodated with the external traffic improvements implemented as discussed. The overall traffic levels are in fact lower than those that would occur under current approvals. These improvements were also identified in the approved Concept Plan and this reflects the fact that the current modifications relate to a development which is substantially the same.

Notwithstanding the above results, the existing intersection of Old Wallgrove Road with Wallgrove Road has been assessed based on current (2010) survey data (and with PA1 traffic added) with a 4-phase arrangement, with a leading right turn from north to west and this delivers improved performance (as shown in **appendix d**) and is recommended for further investigation by the RTA, in the context of its ongoing strategic planning responsibilities.

## 3.9 access & internal design aspects

### 3.9.1 access

The access arrangements comply with all relevant standards. The following factors are noted:

- The main truck access driveways to Site 1A and site 2A are slightly off-set and incorporate generous splays. Access for a 25m B Double is demonstrated in the swept path analysis provided in **appendix e**. This will need to be further assessed at cc stage to ensure compliance with AS 2890.2.
- Separate car access driveways are provided and these will operate satisfactorily. A suitable condition requiring compliance with AS 2890.1 is invited. Finally, sight distances at these driveways is very good;

In summary, the proposed site accesses will operate effectively.

### 3.9.2 internal design

The internal design complies with the requirements of AS 2890.1 and AS 2890.2 and incorporates the following elements:





- Site 1A incorporates a one-way clockwise flow-through system for trucks which is safe and efficient and also provides a safer environment for pedestrians;
- Site 2A (Warehouse 3) incorporates a one-way anti-clockwise flow-through system and this is also safe and efficient;
- Site 2A (Warehouse 2) incorporates a two-way roadway that also serves the shared exit movements from Warehouse 3;
- Provision of sufficient clearances to accommodate a B Double operating with a 12.5 metre radius turn, as defined by Austroads Guidelines is shown in **appendix e**. The detailed design of these areas will require further assessment at construction certificate stage, taking account also of Fairfield Council's requirements for driveway crossings;
- Extensive internal queuing capacity is provided for both sites;
- Cars and trucks are provided with separate access driveways and are separated internally, providing maximum safety for both car drivers and pedestrians;
- Available sight distances at all driveways will be satisfactory, subject to the road verge being landscaped with appropriate species; and
- The parking bays and aisles comply with the requirements of AS 2890.1 and generally incorporate bays of minimum width 2.5 metres with aisles of minimum width 6.0 metres;

In summary, the internal design is considered to be satisfactory and will provide a very good level of safety, convenience and amenity. It will however be necessary to review truck movements prior to construction to ensure that the detailed designs for vertical and horizontal geometry comply with relevant standards.

### 3.10 PA1 conclusions

In summary:

- The traffic generation arising from Project Application No. 1 (84 veh/hr combined in both directions at peak times) can be accommodated on the road network with a 7.0 metre wide road



carriageway along Old Wallgrove Road, providing single lane traffic flow in each direction. This will require improvements to some existing sections of Old Wallgrove Road (including the bridge over the Sydney Water Supply Pipeline), subject to a detailed road conditions audit. The traffic generation is substantially less than was predicted (and is implicit) under current approvals;

- ➡ The intersection of the Estate Road provides safe access, subject to provision of a passing lane as an interim arrangement, pending implementation of the long term road hierarchy;
- ➡ Parking is provided for 381 spaces which is substantially more than required under the RTA's Guideline (188 spaces) and less than Fairfield Council's requirements (711 spaces). This will ensure that on-street parking does not occur;
- ➡ The proposed means of site access is considered satisfactory and traffic will be able to enter and exit the site safely and efficiently in a forward direction, including B-Doubles. In addition, cars and heavy vehicles are physically separated to a significant extent;
- ➡ The internal design arrangements comply with the requirements of AS 2890.1 and AS 2890.2 and will accommodate all required vehicles. The detailed design of the facility, including driveway crossing levels and on-street parking controls, will need to be reviewed prior to construction; and
- ➡ Provision will be made for visitors as well as disabled parkers;

It is therefore concluded that the proposed development (modification) is supportable on traffic planning grounds and the proposed development will operate satisfactorily. Indeed, it will result in an overall improvement when compared with the approved development under Project Application No.1.



## appendix a

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photographic record



View looking south along the Old Wallgrove Road site frontage.



View looking north along the Old Wallgrove Road site frontage.







View looking south along Old Wallgrove Road on approach to the Sydney Water supply pipeline bridge.



View looking west from the M7 Motorway on/off-ramp (southbound) towards its intersection with Wallgrove Road.







View looking east from Old Wallgrove Road towards its intersection with Wallgrove Road.



View looking south along Wallgrove Road towards its intersection with Old Wallgrove Road and the M7 Motorway on/off ramp (southbound).

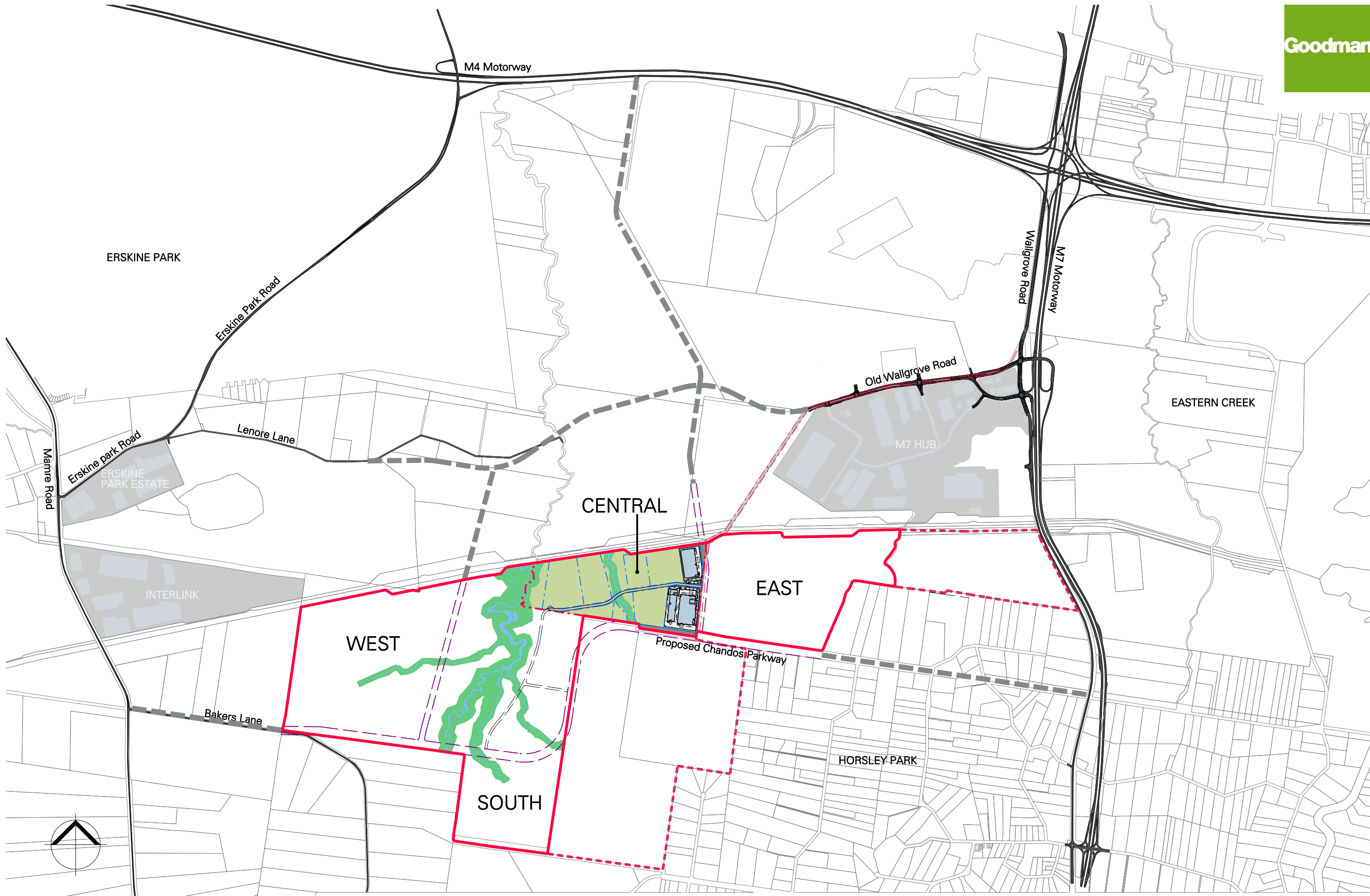




## appendix b

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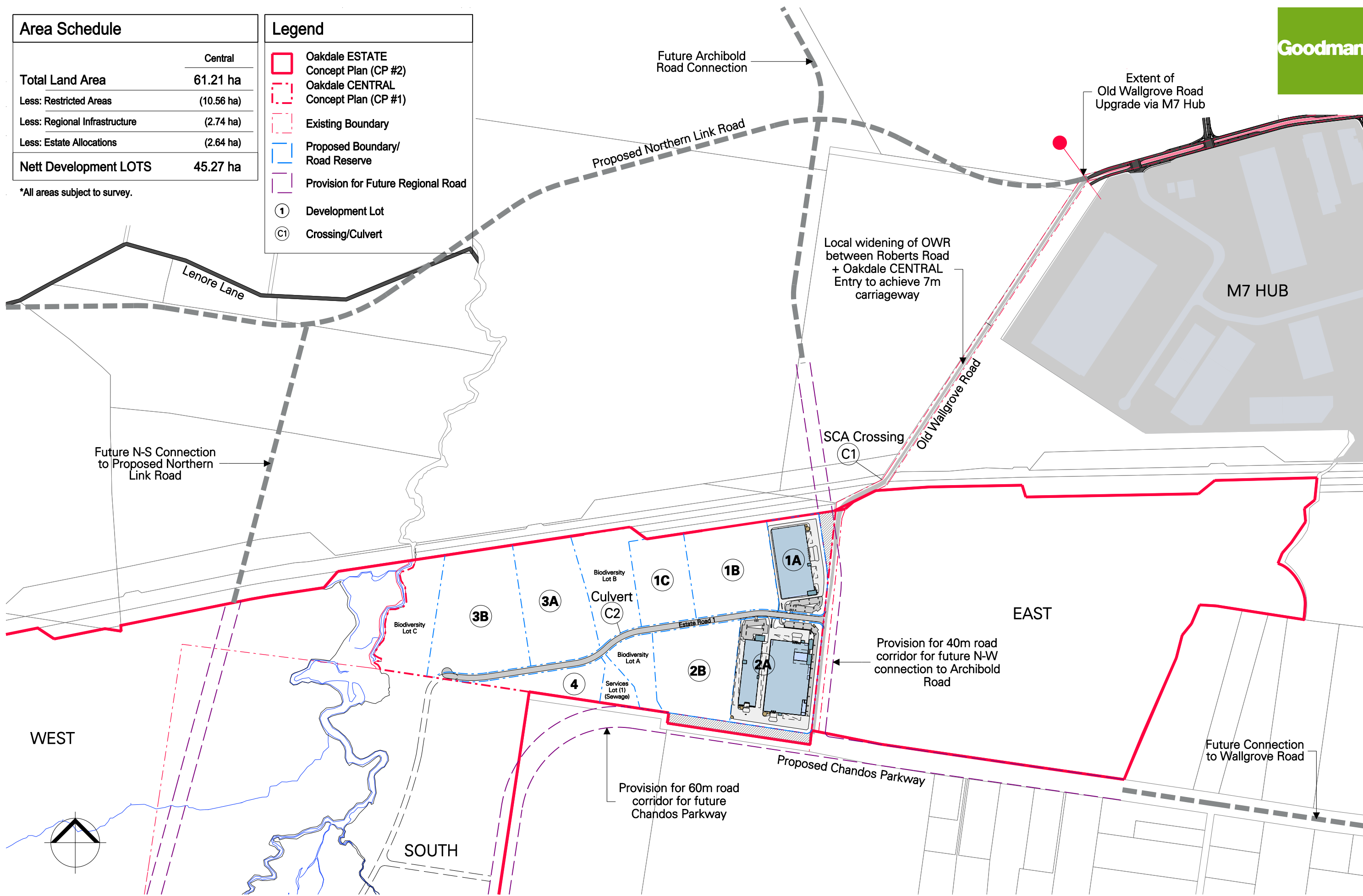
reduced CP1 plans





Area Schedule	
	Central
Total Land Area	61.21 ha
Less: Restricted Areas	(10.56 ha)
Less: Regional Infrastructure	(2.74 ha)
Less: Estate Allocations	(2.64 ha)
Nett Development LOTS	45.27 ha

- Legend**
- Oakdale ESTATE Concept Plan (CP #2)
  - Oakdale CENTRAL Concept Plan (CP #1)
  - Existing Boundary
  - Proposed Boundary/ Road Reserve
  - Provision for Future Regional Road
  - ① Development Lot
  - ①C Crossing/Culvert



Legend

Oakdale ESTATE  
Concept Plan (CP #2)

Oakdale CENTRAL  
Concept Plan (CP #1)

IN1 General Industrial

E2 Environmental Conservation







## appendix c

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reduced CP2 plans

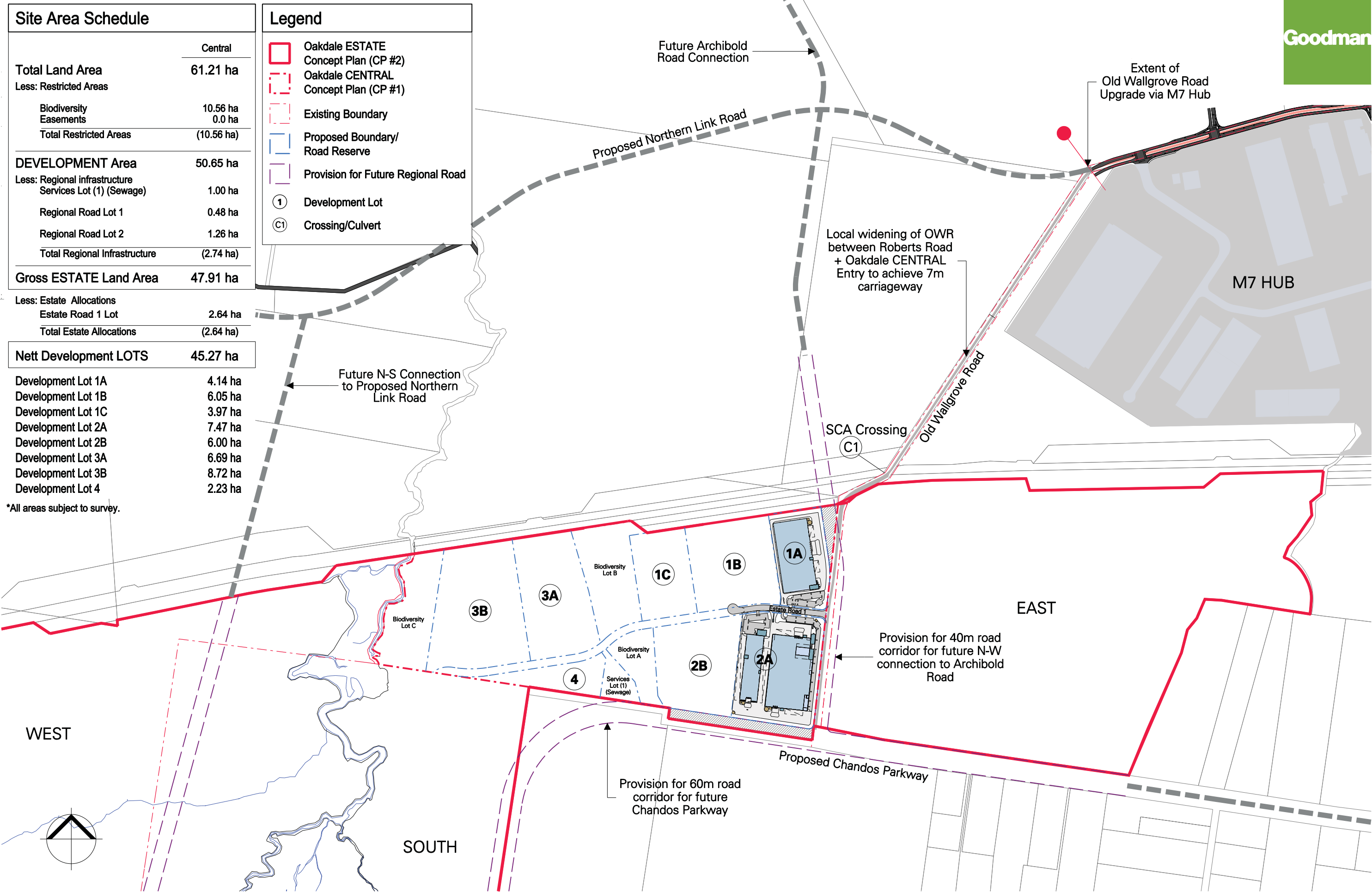
Site Area Schedule	
	Central
Total Land Area	61.21 ha
Less: Restricted Areas	
Biodiversity Easements	10.56 ha
Total Restricted Areas	(10.56 ha)
DEVELOPMENT Area	50.65 ha
Less: Regional infrastructure	
Services Lot (1) (Sewage)	1.00 ha
Regional Road Lot 1	0.48 ha
Regional Road Lot 2	1.26 ha
Total Regional Infrastructure	(2.74 ha)
Gross ESTATE Land Area	47.91 ha

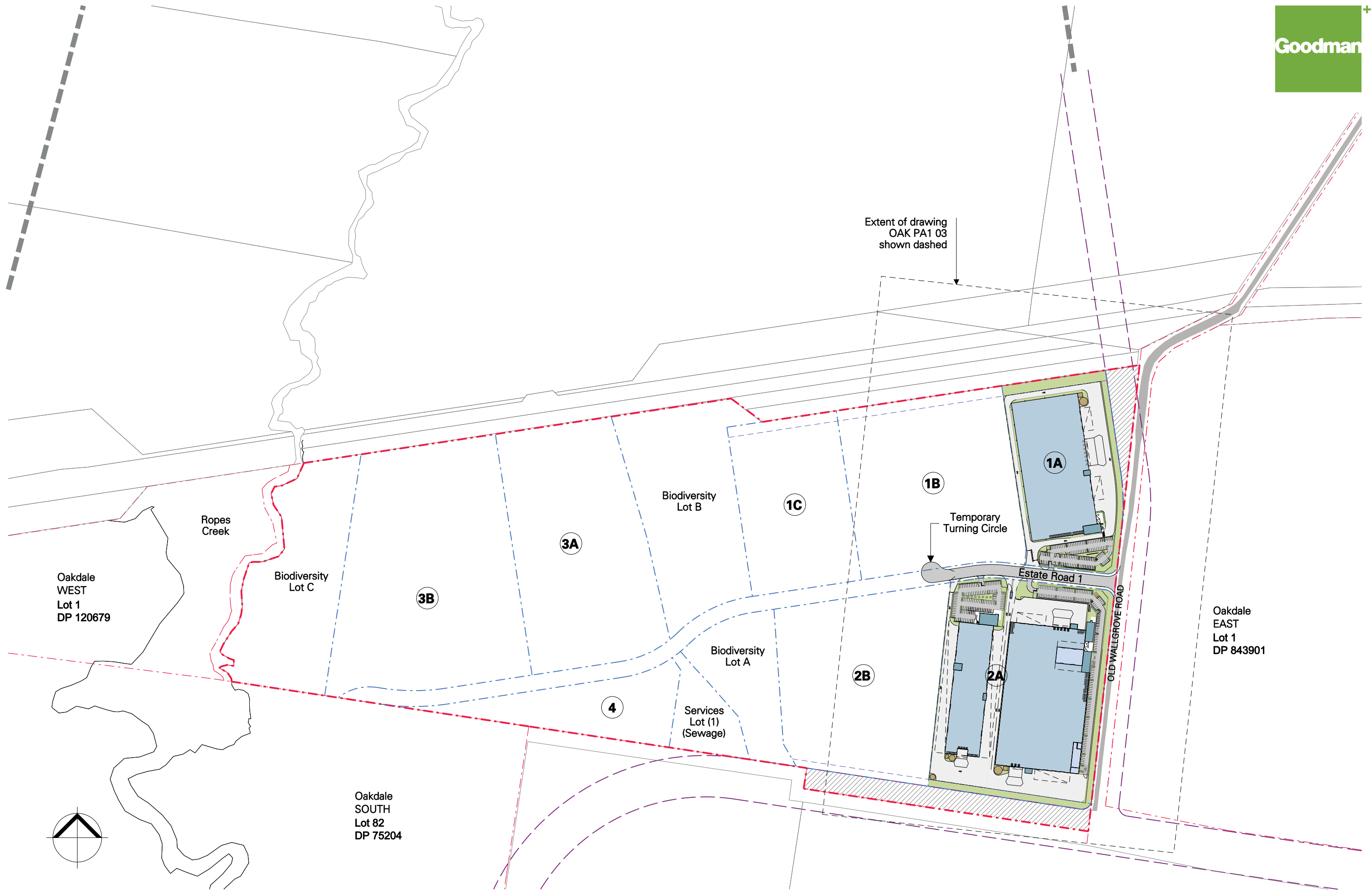
Less: Estate Allocations	
Estate Road 1 Lot	2.64 ha
Total Estate Allocations	(2.64 ha)

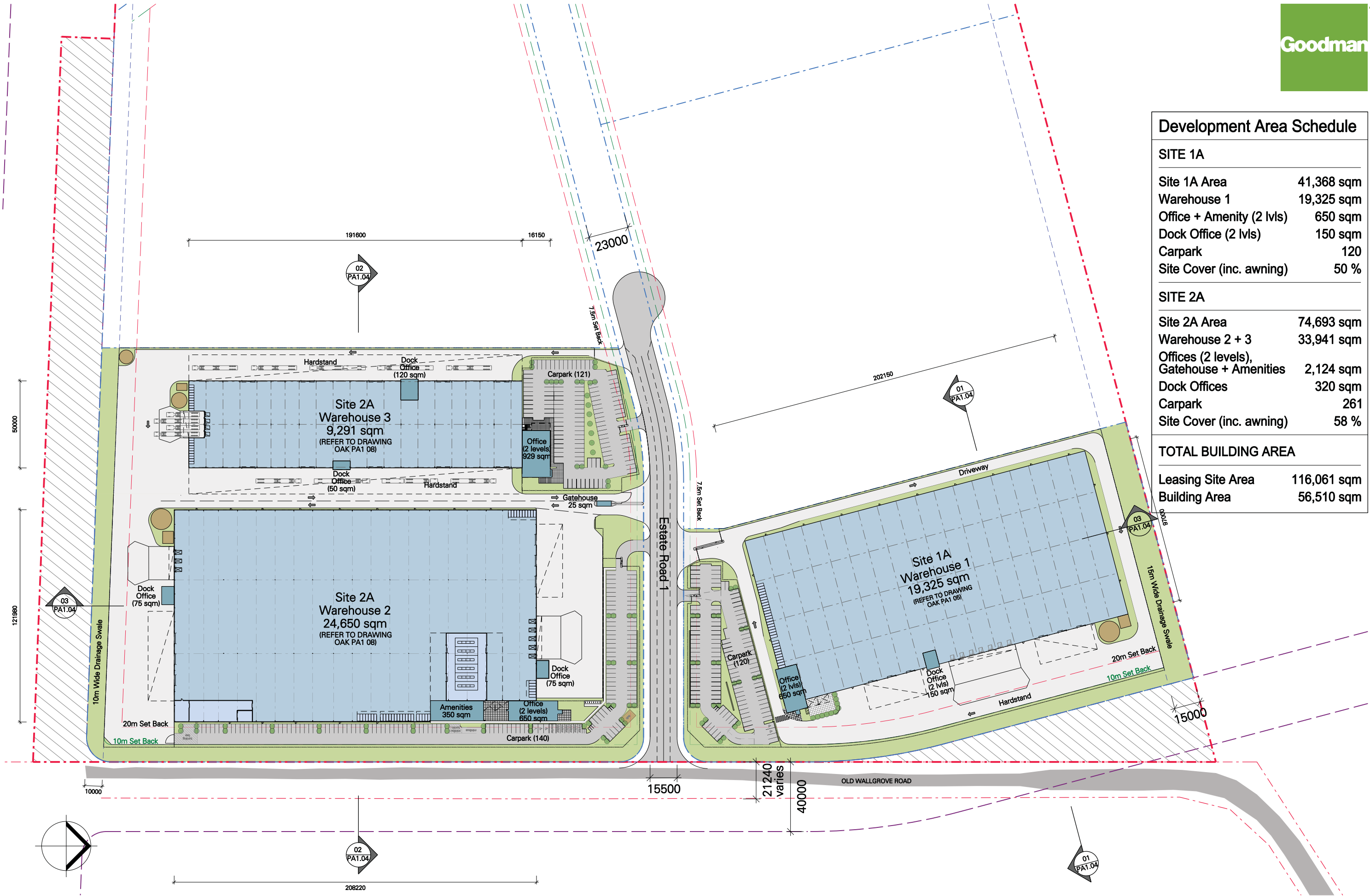
Nett Development LOTS	45.27 ha
Development Lot 1A	4.14 ha
Development Lot 1B	6.05 ha
Development Lot 1C	3.97 ha
Development Lot 2A	7.47 ha
Development Lot 2B	6.00 ha
Development Lot 3A	6.69 ha
Development Lot 3B	8.72 ha
Development Lot 4	2.23 ha

\*All areas subject to survey.

Legend	
	Oakdale ESTATE Concept Plan (CP #2)
	Oakdale CENTRAL Concept Plan (CP #1)
	Existing Boundary
	Proposed Boundary/ Road Reserve
	Provision for Future Regional Road
	Development Lot
	Crossing/Culvert







Development Area Schedule

SITE 1A

Site 1A Area	41,368 sqm
Warehouse 1	19,325 sqm
Office + Amenity (2 lvls)	650 sqm
Dock Office (2 lvls)	150 sqm
Carpark	120
Site Cover (inc. awning)	50 %

SITE 2A

Site 2A Area	74,693 sqm
Warehouse 2 + 3	33,941 sqm
Offices (2 levels), Gatehouse + Amenities	2,124 sqm
Dock Offices	320 sqm
Carpark	261
Site Cover (inc. awning)	58 %

TOTAL BUILDING AREA

Leasing Site Area	116,061 sqm
Building Area	56,510 sqm



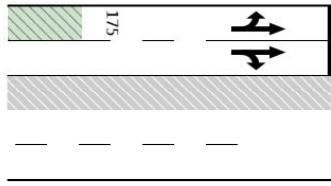
## appendix d

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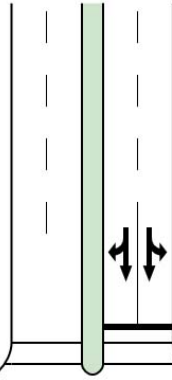
sidra outputs



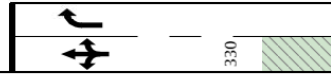
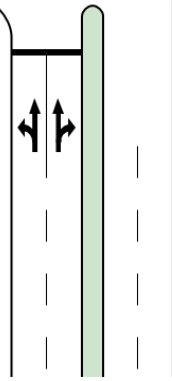
Old Wallgrove Road



Wallgrove Road North



Wallgrove Road South



M7 Ramps

# MOVEMENT SUMMARY

Site: Existing AM Peak

Wallgrove Rd / Old Wallgrove Rd

Scenario: Existing

Period: AM

Signals - Fixed Time Cycle Time = 150 seconds

## Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV Deg. Satn %	Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Wallgrove Road South											
1	L	163	8.0	0.482	20.7	LOS B	19.5	146.0	0.52	0.96	39.5
2	T	886	8.0	0.482	18.1	LOS B	21.8	163.3	0.60	0.56	38.3
3	R	6	8.0	0.481	32.2	LOS C	21.8	163.3	0.68	0.95	33.4
Approach		1056	8.0	0.482	18.6	LOS B	21.8	163.3	0.59	0.62	38.4
East: M7 Ramps											
4	L	69	8.0	1.047	154.9	LOS F	19.0	141.9	1.00	1.23	11.5
5	T	95	8.0	1.046	146.4	LOS F	19.0	141.9	1.00	1.23	11.6
6	R	43	8.0	0.283	79.6	LOS F	4.3	32.1	0.97	0.75	18.8
Approach		207	8.0	1.046	135.3	LOS F	19.0	141.9	0.99	1.13	12.6
North: Wallgrove Road North											
7	L	93	8.0	0.942	47.9	LOS D	86.9	649.7	0.98	1.02	27.2
8	T	1052	8.0	0.939	39.4	LOS C	86.9	649.7	0.98	1.00	27.4
9	R	180	8.0	1.026	160.6	LOS F	23.5	176.1	1.00	1.23	11.1
Approach		1324	8.0	1.026	56.5	LOS D	86.9	649.7	0.98	1.03	22.8
West: Old Wallgrove Road											
10	L	41	8.0	0.335	75.8	LOS F	6.2	46.6	0.96	0.77	19.7
11	T	46	8.0	0.335	67.4	LOS E	6.2	46.6	0.96	0.74	19.8
12	R	48	8.0	0.335	75.8	LOS F	6.2	46.4	0.96	0.77	19.7
Approach		136	8.0	0.335	72.9	LOS F	6.2	46.6	0.96	0.76	19.8
All Vehicles		2723	8.0	1.046	48.6	LOS D	86.9	649.7	0.83	0.87	25.0

Level of Service (Aver. Int. Delay): LOS D. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on average delay for all vehicle movements.

## Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate per ped
					Pedestrian ped	Distance m		
P5	Across N approach	5	69.1	LOS F	0.0	0.0	0.96	0.96
P7	Across W approach	5	12.4	LOS B	0.0	0.0	0.41	0.41
All Pedestrians		10	40.8				0.68	0.68

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).

Level of Service (Worst Movement): LOS F. LOS Method for individual pedestrian movements: Delay (HCM).

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# PHASING SUMMARY

Site: Existing AM Peak

Wallgrove Rd / Old Wallgrove Rd

Scenario: Existing

Period: AM

Signals - Fixed Time Cycle Time = 150 seconds

Cycle Time Option: **User-specified Cycle Time**

Phase times determined by the program

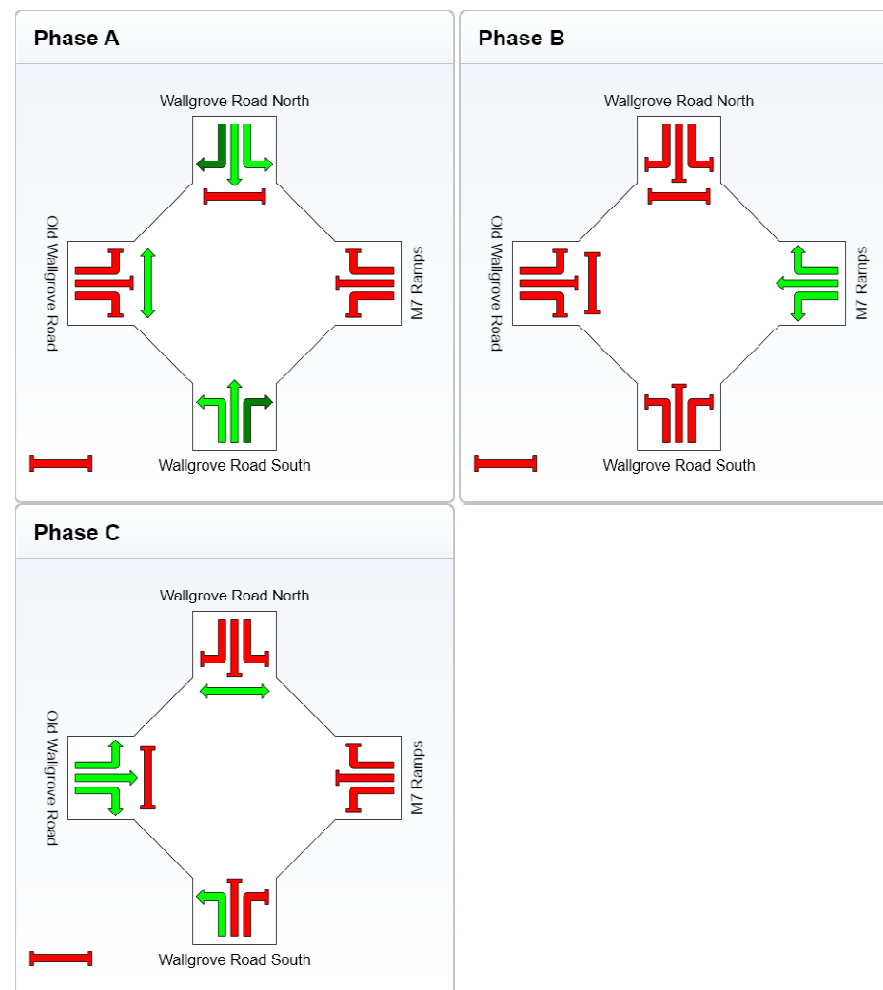
Sequence: Three-phase

Input Sequence: A, B, C

Output Sequence: A, B, C

## Phase Timing Results

Phase	A	B	C
Green Time (sec)	99	13	17
Yellow Time (sec)	5	5	5
All-Red Time (sec)	2	2	2
Phase Time (sec)	106	20	24
Phase Split	71 %	13 %	16 %



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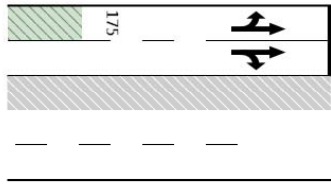
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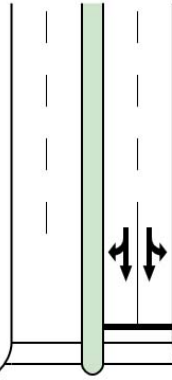
**SIDRA**  
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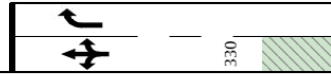
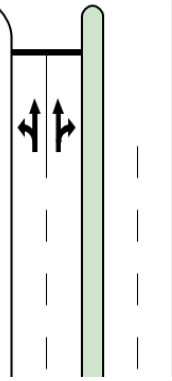
Old Wallgrove Road



Wallgrove Road North



Wallgrove Road South



M7 Ramps

# MOVEMENT SUMMARY

Site: Existing PM Peak

Wallgrove Rd / Old Wallgrove Rd

Scenario: Existing

Period: PM

Signals - Fixed Time Cycle Time = 150 seconds

## Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV Deg. Satn %	Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Wallgrove Road South											
1	L	57	8.0	0.681	26.6	LOS B	36.3	271.5	0.67	0.99	36.4
2	T	1453	8.0	0.679	21.2	LOS B	36.3	271.5	0.72	0.67	36.2
3	R	9	8.0	0.681	33.2	LOS C	35.3	263.8	0.77	0.95	33.1
Approach		1519	8.0	0.679	21.5	LOS B	36.3	271.5	0.71	0.68	36.2
East: M7 Ramps											
4	L	69	8.0	1.134	223.6	LOS F	22.7	169.6	1.00	1.38	8.5
5	T	95	8.0	1.133	215.1	LOS F	22.7	169.6	1.00	1.38	8.5
6	R	43	8.0	0.307	80.9	LOS F	4.3	32.4	0.98	0.74	18.6
Approach		207	8.0	1.133	190.0	LOS F	22.7	169.6	1.00	1.25	9.6
North: Wallgrove Road North											
7	L	144	8.0	0.881	30.9	LOS C	62.8	469.6	0.89	0.95	34.2
8	T	925	8.0	0.881	22.4	LOS B	62.8	469.6	0.89	0.84	34.9
9	R	111	8.0	1.205	309.0	LOS F	20.2	151.0	1.00	1.51	6.3
Approach		1180	8.0	1.204	50.3	LOS D	62.8	469.6	0.90	0.92	24.5
West: Old Wallgrove Road											
10	L	252	8.0	1.195	276.0	LOS F	38.3	286.8	1.00	1.37	7.0
11	T	55	8.0	0.933	91.4	LOS F	18.4	137.4	1.00	1.04	16.2
12	R	140	8.0	0.933	99.8	LOS F	18.4	137.4	1.00	1.04	16.2
Approach		452	8.0	1.195	197.7	LOS F	38.3	286.8	1.00	1.23	9.3
All Vehicles		3358	8.0	1.204	65.6	LOS E	62.8	469.6	0.83	0.87	21.0

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on average delay for all vehicle movements.

## Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate per ped
					Pedestrian ped	Distance m		
P5	Across N approach	5	68.2	LOS F	0.0	0.0	0.95	0.95
P7	Across W approach	5	12.4	LOS B	0.0	0.0	0.41	0.41
All Pedestrians		10	40.3				0.68	0.68

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).

Level of Service (Worst Movement): LOS F. LOS Method for individual pedestrian movements: Delay (HCM).

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# PHASING SUMMARY

Site: Existing PM Peak

Wallgrove Rd / Old Wallgrove Rd

Scenario: Existing

Period: PM

Signals - Fixed Time Cycle Time = 150 seconds

Cycle Time Option: **User-specified Cycle Time**

Phase times determined by the program

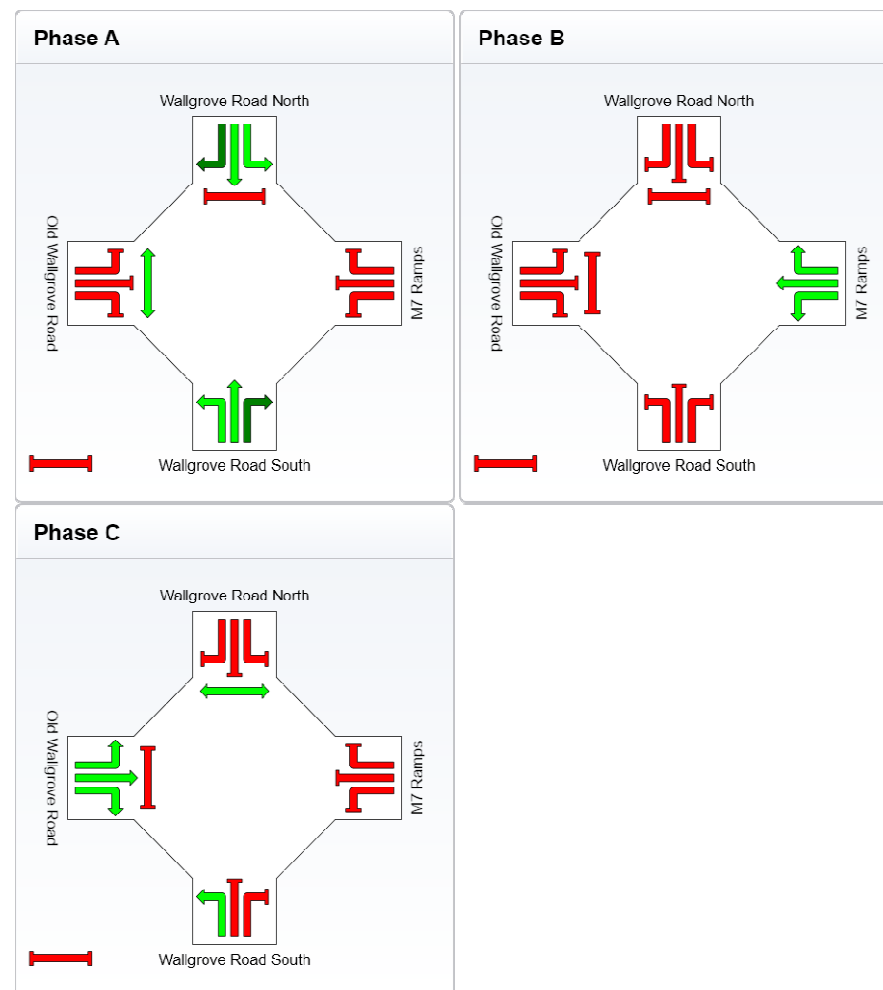
Sequence: **Three-phase**

Input Sequence: **A, B, C**

Output Sequence: **A, B, C**

## Phase Timing Results

Phase	A	B	C
Green Time (sec)	99	12	18
Yellow Time (sec)	5	5	5
All-Red Time (sec)	2	2	2
Phase Time (sec)	106	19	25
Phase Split	71 %	13 %	17 %



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**SIDRA**  
**INTERSECTION**

Existing plus Development (existing phasing)

# MOVEMENT SUMMARY

Site: 3 Phase Proposed AM Peak

Wallgrove Rd / Old Wallgrove Rd  
Scenario: Existing + Development  
Period: AM  
Signals - Fixed Time Cycle Time = 150 seconds

## Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		Vehicles	Distance		per veh	km/h
							veh	m			
South: Wallgrove Road South											
1	L	187	8.0	0.484	19.7	LOS B	19.1	142.7	0.51	0.95	40.1
2	T	886	8.0	0.484	17.3	LOS B	22.1	165.1	0.60	0.55	38.9
3	R	6	8.0	0.484	31.1	LOS C	22.1	165.1	0.67	0.95	33.9
Approach		1080	8.0	0.484	17.8	LOS B	22.1	165.1	0.58	0.62	39.0
East: M7 Ramps											
4	L	69	8.0	1.232	309.3	LOS F	29.1	217.4	1.00	1.55	6.3
5	T	109	8.0	1.233	300.8	LOS F	29.1	217.4	1.00	1.55	6.4
6	R	43	8.0	0.307	80.9	LOS F	4.3	32.4	0.98	0.74	18.6
Approach		222	8.0	1.233	260.8	LOS F	29.1	217.4	1.00	1.40	7.3
North: Wallgrove Road North											
7	L	93	8.0	0.933	43.3	LOS D	82.6	618.1	0.96	1.01	28.8
8	T	1052	8.0	0.930	34.9	LOS C	82.6	618.1	0.96	0.97	29.1
9	R	208	8.0	1.195	291.6	LOS F	35.7	266.9	1.00	1.48	6.7
Approach		1353	8.0	1.196	75.0	LOS F	82.6	618.1	0.97	1.05	19.1
West: Old Wallgrove Road											
10	L	47	8.0	0.382	76.3	LOS F	7.0	52.3	0.97	0.78	19.6
11	T	53	8.0	0.382	67.8	LOS E	7.0	52.3	0.97	0.75	19.8
12	R	55	8.0	0.382	76.2	LOS F	7.0	52.1	0.97	0.78	19.6
Approach		155	8.0	0.382	73.4	LOS F	7.0	52.3	0.97	0.77	19.7
All Vehicles		2809	8.0	1.233	67.6	LOS E	82.6	618.1	0.82	0.90	20.6

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on average delay for all vehicle movements.

## Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian	Distance		
					ped	m		per ped
P5	Across N approach	5	69.1	LOS F	0.0	0.0	0.96	0.96
P7	Across W approach	5	12.0	LOS B	0.0	0.0	0.40	0.40
All Pedestrians		10	40.6				0.68	0.68

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).

Level of Service (Worst Movement): LOS F. LOS Method for individual pedestrian movements: Delay (HCM).

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# MOVEMENT SUMMARY

Site: 3 Phase Proposed PM  
Peak

Wallgrove Rd / Old Wallgrove Rd  
Scenario: Existing + Development  
Period: PM  
Signals - Fixed Time Cycle Time = 150 seconds

## Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		Vehicles	Distance		per veh	km/h
							veh	m			
South: Wallgrove Road South											
1	L	60	8.0	0.673	25.7	LOS B	35.5	265.6	0.65	0.99	36.9
2	T	1453	8.0	0.672	20.1	LOS B	35.5	265.6	0.70	0.66	36.9
3	R	9	8.0	0.674	31.9	LOS C	34.7	259.3	0.75	0.96	33.7
Approach		1522	8.0	0.672	20.4	LOS B	35.5	265.6	0.70	0.67	36.9
East: M7 Ramps											
4	L	69	8.0	1.260	333.2	LOS F	28.4	212.1	1.00	1.57	5.9
5	T	98	8.0	1.259	324.7	LOS F	28.4	212.1	1.00	1.57	6.0
6	R	43	8.0	0.335	82.3	LOS F	4.4	32.7	0.99	0.74	18.4
Approach		211	8.0	1.259	277.8	LOS F	28.4	212.1	1.00	1.40	6.9
North: Wallgrove Road North											
7	L	144	8.0	0.872	29.4	LOS C	61.0	456.1	0.87	0.95	35.0
8	T	925	8.0	0.872	21.0	LOS B	61.0	456.1	0.87	0.82	35.8
9	R	123	8.0	1.309	399.0	LOS F	25.0	187.1	1.00	1.65	5.0
Approach		1193	8.0	1.309	61.0	LOS E	61.0	456.1	0.88	0.92	21.9
West: Old Wallgrove Road											
10	L	252	8.0	1.196	276.0	LOS F	38.3	286.8	1.00	1.37	7.0
11	T	65	8.0	1.256	320.7	LOS F	44.9	336.2	1.00	1.61	6.0
12	R	162	8.0	1.257	329.1	LOS F	44.9	336.2	1.00	1.61	6.0
Approach		521	8.0	1.257	302.8	LOS F	44.9	336.2	1.00	1.48	6.5
All Vehicles		3446	8.0	1.309	92.7	LOS F	61.0	456.1	0.83	0.91	17.0

Level of Service (Aver. Int. Delay): LOS F. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on average delay for all vehicle movements.

## Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian	Distance		
					ped	m		per ped
P5	Across N approach	5	68.2	LOS F	0.0	0.0	0.95	0.95
P7	Across W approach	5	12.0	LOS B	0.0	0.0	0.40	0.40
All Pedestrians		10	40.1				0.68	0.68

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).

Level of Service (Worst Movement): LOS F. LOS Method for individual pedestrian movements: Delay (HCM).

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Existing plus Development (New 4 Phase Signals)

# MOVEMENT SUMMARY

Site: Proposed AM Peak

Wallgrove Rd / Old Wallgrove Rd

Scenario: Existing + Development (New Signal Phasing)

Period: AM

Signals - Fixed Time Cycle Time = 150 seconds

## Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV Deg. Satn %	v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Wallgrove Road South											
1	L	187	8.0	0.791	50.7	LOS D	36.2	270.9	0.95	0.90	25.9
2	T	886	8.0	0.791	44.4	LOS D	36.2	270.9	0.95	0.86	25.7
3	R	6	8.0	0.800	54.5	LOS D	34.0	254.1	0.96	0.91	25.2
Approach		1080	8.0	0.791	45.6	LOS D	36.2	270.9	0.95	0.87	25.8
East: M7 Ramps											
4	L	69	8.0	0.821	84.8	LOS F	15.2	113.7	1.00	0.93	18.4
5	T	109	8.0	0.822	76.3	LOS F	15.2	113.7	1.00	0.93	18.5
6	R	43	8.0	0.205	73.5	LOS F	4.1	30.6	0.94	0.75	19.9
Approach		222	8.0	0.822	78.4	LOS F	15.2	113.7	0.99	0.89	18.7
North: Wallgrove Road North											
7	L	93	8.0	0.826	31.2	LOS C	52.6	393.7	0.84	0.95	34.0
8	T	1052	8.0	0.823	27.2	LOS B	52.6	393.7	0.87	0.82	32.4
9	R	208	8.0	0.823	55.4	LOS D	23.4	175.3	1.00	0.99	24.3
Approach		1353	8.0	0.823	31.8	LOS C	52.6	393.7	0.89	0.86	30.9
West: Old Wallgrove Road											
10	L	47	8.0	0.382	76.3	LOS F	7.0	52.3	0.97	0.78	19.6
11	T	53	8.0	0.382	67.8	LOS E	7.0	52.3	0.97	0.75	19.8
12	R	55	8.0	0.382	76.2	LOS F	7.0	52.1	0.97	0.78	19.6
Approach		155	8.0	0.382	73.4	LOS F	7.0	52.3	0.97	0.77	19.7
All Vehicles		2809	8.0	0.823	43.1	LOS D	52.6	393.7	0.93	0.86	26.6

Level of Service (Aver. Int. Delay): LOS D. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on average delay for all vehicle movements.

## Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate per ped
					Pedestrian ped	Distance m		
P5	Across N approach	5	69.1	LOS F	0.0	0.0	0.96	0.96
P7	Across W approach	5	36.1	LOS D	0.0	0.0	0.69	0.69
All Pedestrians		10	52.6				0.83	0.83

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).

Level of Service (Worst Movement): LOS F. LOS Method for individual pedestrian movements: Delay (HCM).

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**SIDRA**  
**INTERSECTION**

# PHASING SUMMARY

Site: Proposed AM Peak

Wallgrove Rd / Old Wallgrove Rd

Scenario: Existing + Development (New Signal Phasing)

Period: AM

Signals - Fixed Time Cycle Time = 150 seconds

Cycle Time Option: **User-specified Cycle Time**

Phase times determined by the program

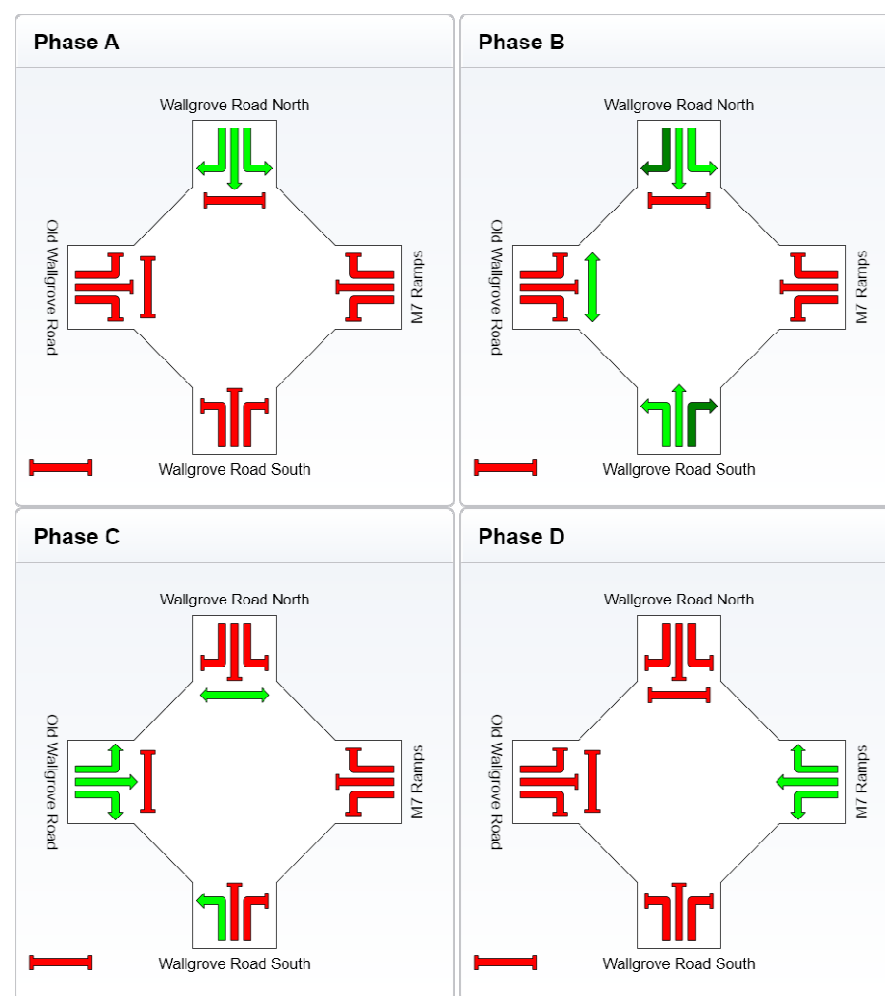
Sequence: **Four-phase**

Input Sequence: **A, B, C, D**

Output Sequence: **A, B, C, D**

## Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	31	56	17	18
Yellow Time (sec)	5	5	5	5
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	38	63	24	25
Phase Split	25 %	42 %	16 %	17 %



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**INTERSECTION**

# MOVEMENT SUMMARY

Site: Proposed PM Peak

Wallgrove Rd / Old Wallgrove Rd

Scenario: Existing + Development (New Signal Phasing)

Period: PM

Signals - Fixed Time Cycle Time = 150 seconds

## Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV Deg. Satn %	Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Wallgrove Road South											
1	L	60	8.0	0.942	68.7	LOS E	70.4	526.8	1.00	1.06	21.6
2	T	1453	8.0	0.941	64.7	LOS E	70.4	526.8	1.00	1.07	20.8
3	R	9	8.0	0.940	78.2	LOS F	58.8	439.8	1.00	1.08	19.8
Approach		1522	8.0	0.941	64.9	LOS E	70.4	526.8	1.00	1.07	20.8
East: M7 Ramps											
4	L	69	8.0	0.924	98.9	LOS F	15.6	116.7	1.00	1.04	16.4
5	T	98	8.0	0.924	90.5	LOS F	15.6	116.7	1.00	1.04	16.5
6	R	43	8.0	0.246	77.0	LOS F	4.2	31.5	0.96	0.75	19.3
Approach		211	8.0	0.924	90.5	LOS F	15.6	116.7	0.99	0.98	17.0
North: Wallgrove Road North											
7	L	144	8.0	0.956	64.4	LOS E	88.1	658.7	1.00	1.07	22.5
8	T	925	8.0	0.956	56.9	LOS E	88.1	658.7	1.00	1.07	22.3
9	R	123	8.0	0.956	89.9	LOS F	12.4	92.7	1.00	1.09	17.4
Approach		1193	8.0	0.956	61.3	LOS E	88.1	658.7	1.00	1.07	21.7
West: Old Wallgrove Road											
10	L	294	8.0	0.964	107.0	LOS F	27.7	207.1	1.00	1.03	15.2
11	T	65	8.0	0.735	65.5	LOS E	17.5	130.5	1.00	0.86	20.1
12	R	162	8.0	0.735	73.9	LOS F	17.5	130.5	1.00	0.86	20.0
Approach		521	8.0	0.964	91.5	LOS F	27.7	207.1	1.00	0.96	17.0
All Vehicles		3446	8.0	0.964	69.2	LOS E	88.1	658.7	1.00	1.05	20.2

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on average delay for all vehicle movements.

## Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate per ped
					Pedestrian ped	Distance m		
P5	Across N approach	5	60.8	LOS F	0.0	0.0	0.90	0.90
P7	Across W approach	5	25.8	LOS C	0.0	0.0	0.59	0.59
All Pedestrians		10	43.3				0.74	0.74

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).

Level of Service (Worst Movement): LOS F. LOS Method for individual pedestrian movements: Delay (HCM).

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# PHASING SUMMARY

Site: Proposed PM Peak

Wallgrove Rd / Old Wallgrove Rd

Scenario: Existing + Development (New Signal Phasing)

Period: PM

Signals - Fixed Time Cycle Time = 150 seconds

Cycle Time Option: **User-specified Cycle Time**

Phase times determined by the program

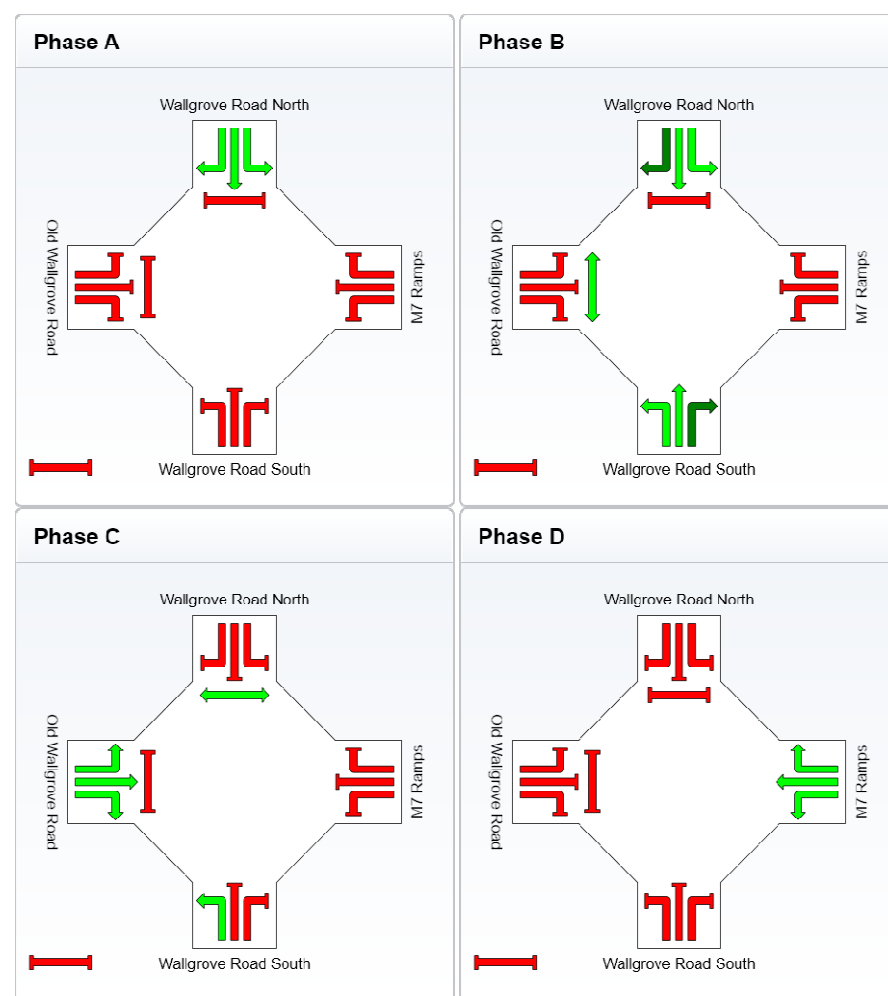
Sequence: **Four-phase**

Input Sequence: **A, B, C, D**

Output Sequence: **A, B, C, D**

## Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	9	72	26	15
Yellow Time (sec)	5	5	5	5
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	16	79	33	22
Phase Split	11 %	53 %	22 %	15 %



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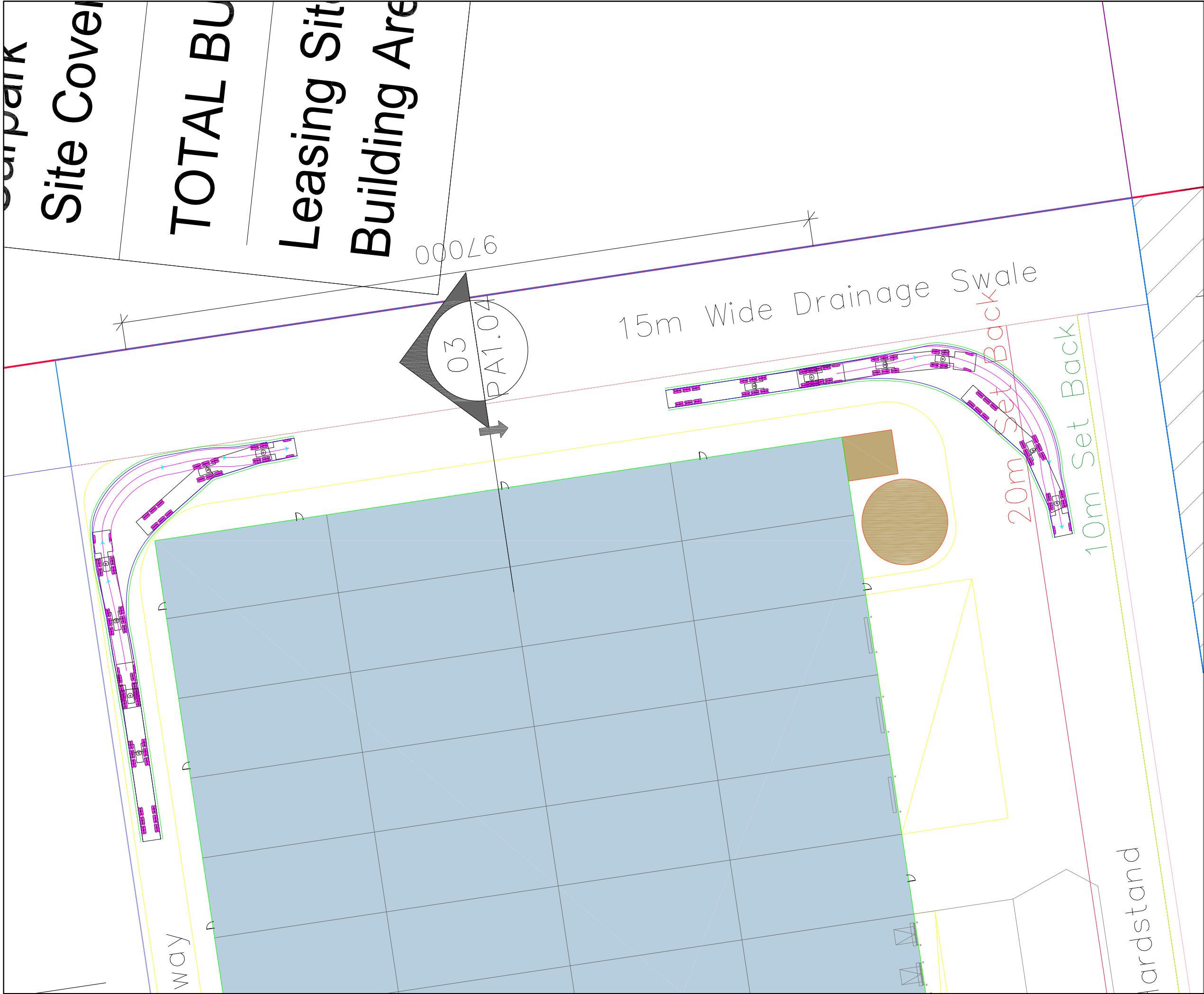




## appendix e

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swept path analysis



notes

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no.

revision note

by.

date

client

Goodman International

Level 10  
60 Castlereagh Street  
Sydney NSW 2000

scale

1:500 @ A3

m

0

5

10

15

20

project

Estate Works + DHL Project  
Oakdale Central  
Horsley Park

drawing prepared by

**TRAFFIX**  
traffic and transport planners  
suite 3.08 46a madaey street  
potts point NSW 2011  
PO Box 1061 potts point nsw 1035  
t: +61 2 8324 8700  
f: +61 2 9380 4481  
e: info@trafix.com.au

drawing title

25 M B-Double Swept Paths 5

drawn:

checked:

date:

10 097

DA

TX.05

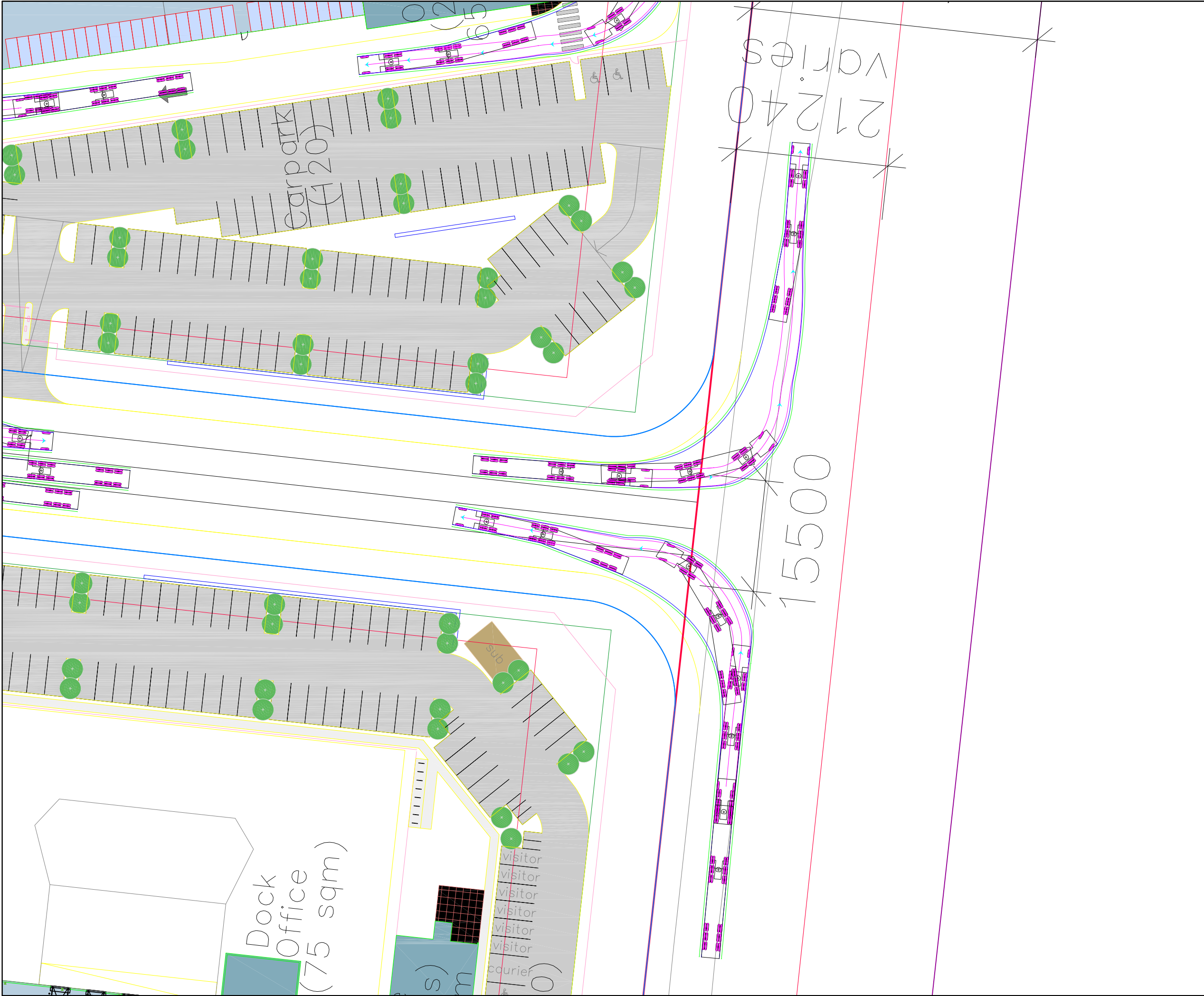
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project no.

drawing phase.

drawing no.

rev



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no.

revision

note

by.

date

client

Goodman International

Level 10  
60 Castlereagh Street  
Sydney NSW 2000

scale

1:500 @ A3

m

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project

Estate Works + DHL Project

Oakdale Central

Horsley Park

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drawing title

25 M B-Double Swept Paths 4

drawn:

checked:

date:

10 097

DA

TX.04

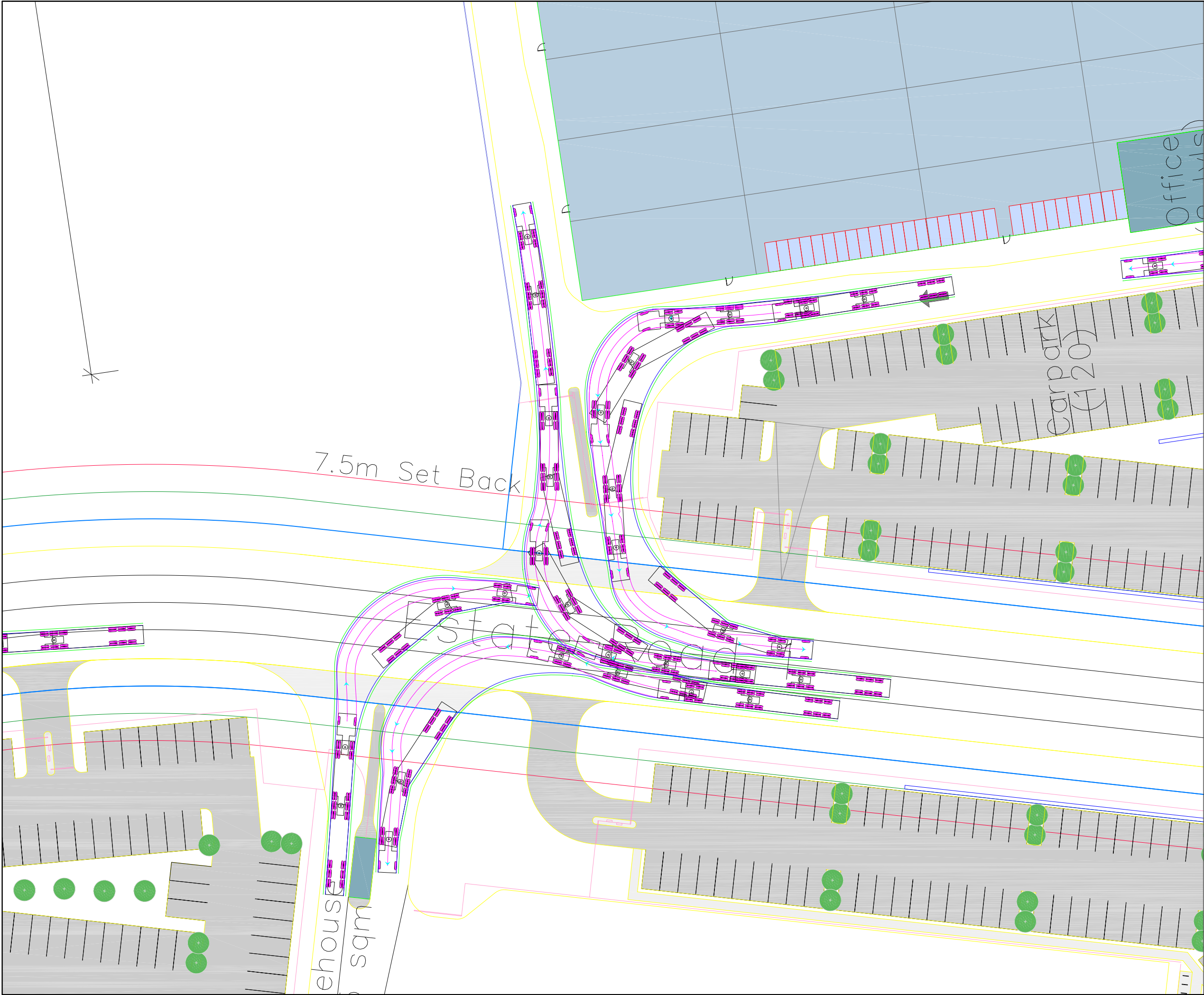
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project no.

drawing phase.

drawing no.

rev



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client  
Goodman International  
Level 10  
60 Castlereagh Street  
Sydney NSW 2000

scale  
1:500 @ A3  
m 0 5 10 15 20  
0

project  
Estate Works + DHL Project  
Oakdale Central  
Horsley Park

drawing prepared by  
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PO Box 1061 potts point nsw 1035  
t: +61 2 8324 8700  
f: +61 2 9380 4481  
e: info@traffix.com.au

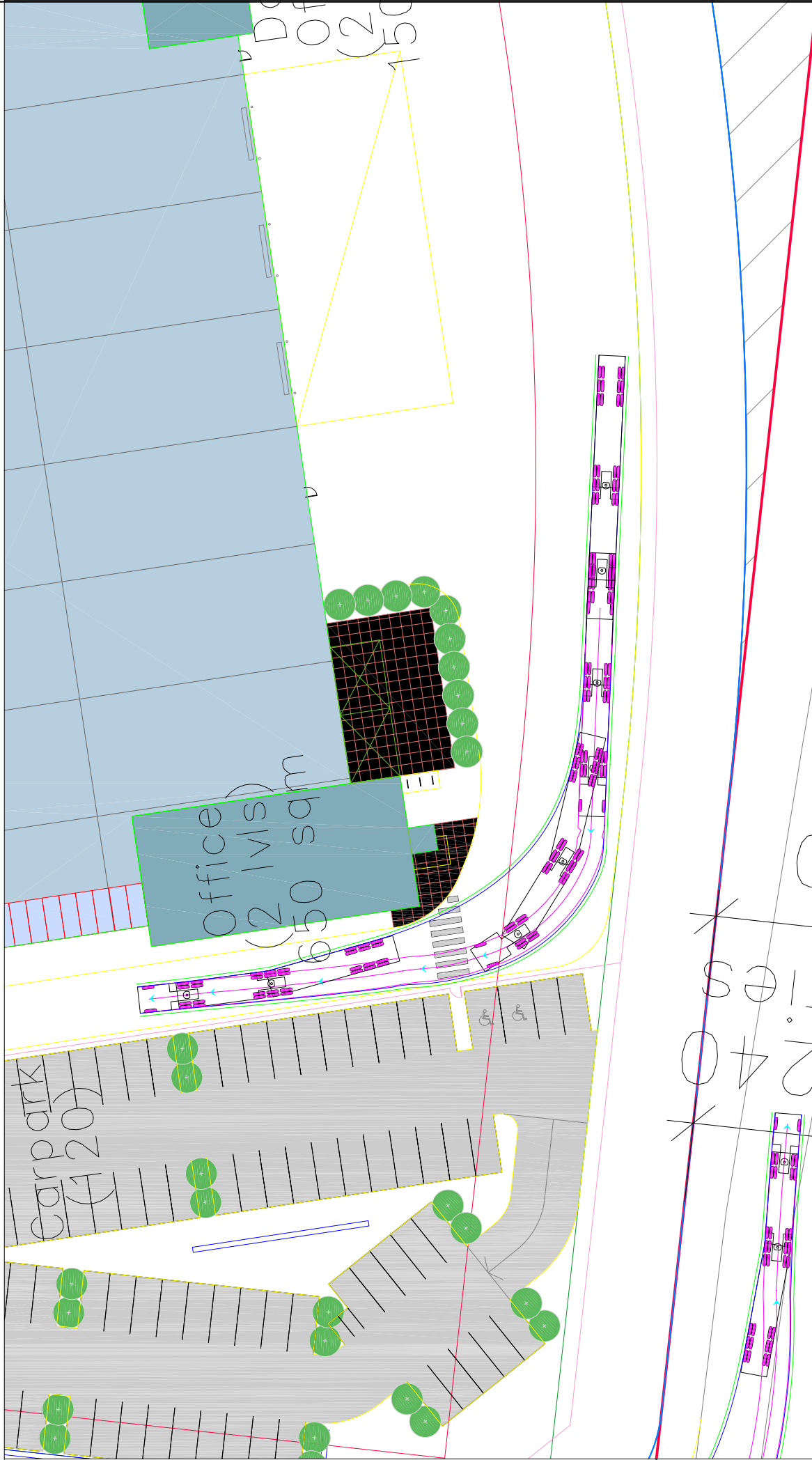
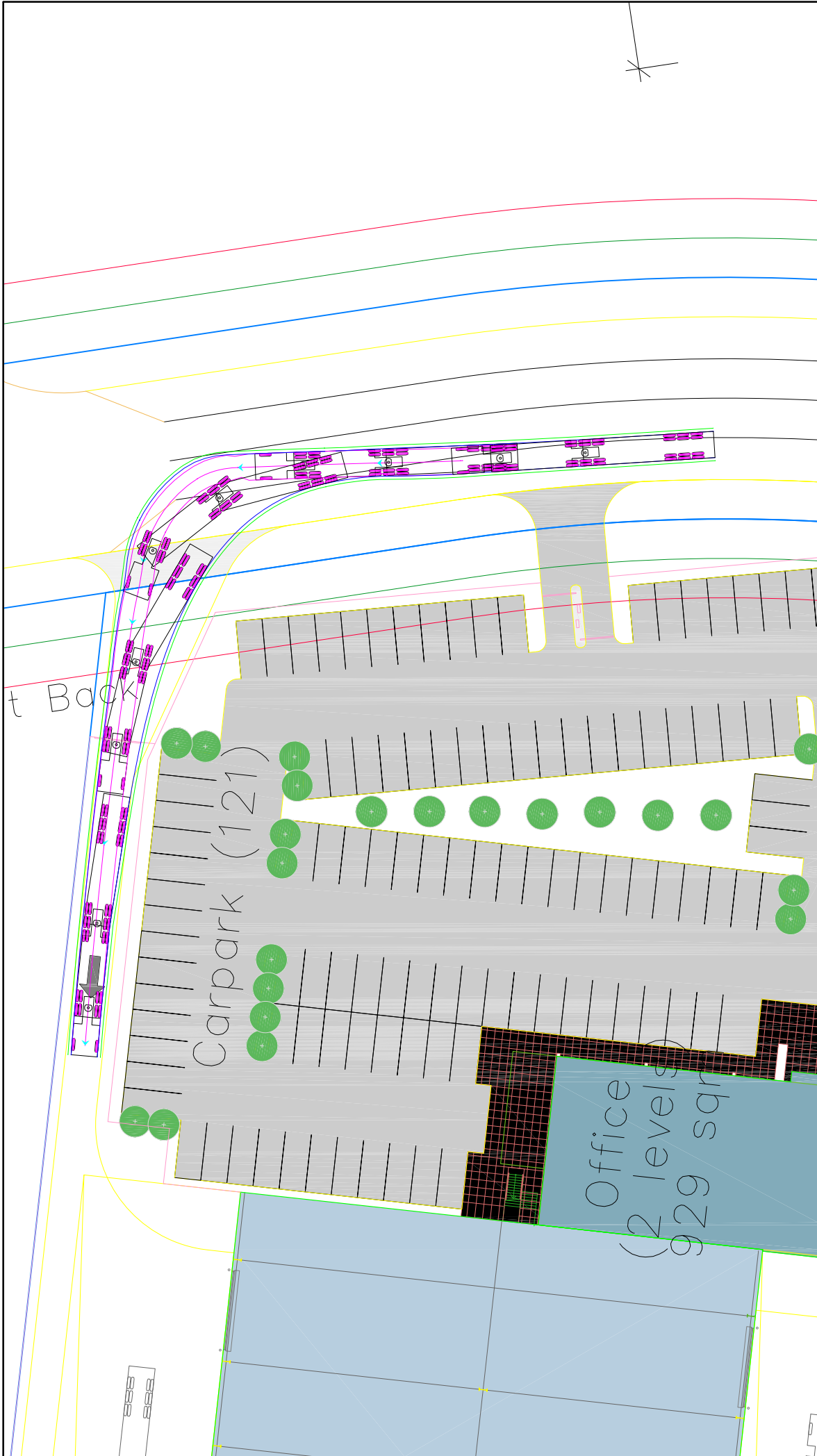


drawing title  
25 M B-Double Swept Paths 3

drawn: checked: date:

10 097	DA	TX.03	-
project no.	drawing phase.	drawing no.	rev





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client  
Goodman International  
Level 10  
60 Castlereagh Street  
Sydney NSW 2000

scale  
1:500 @ A3  
m 0 5 10 15 20

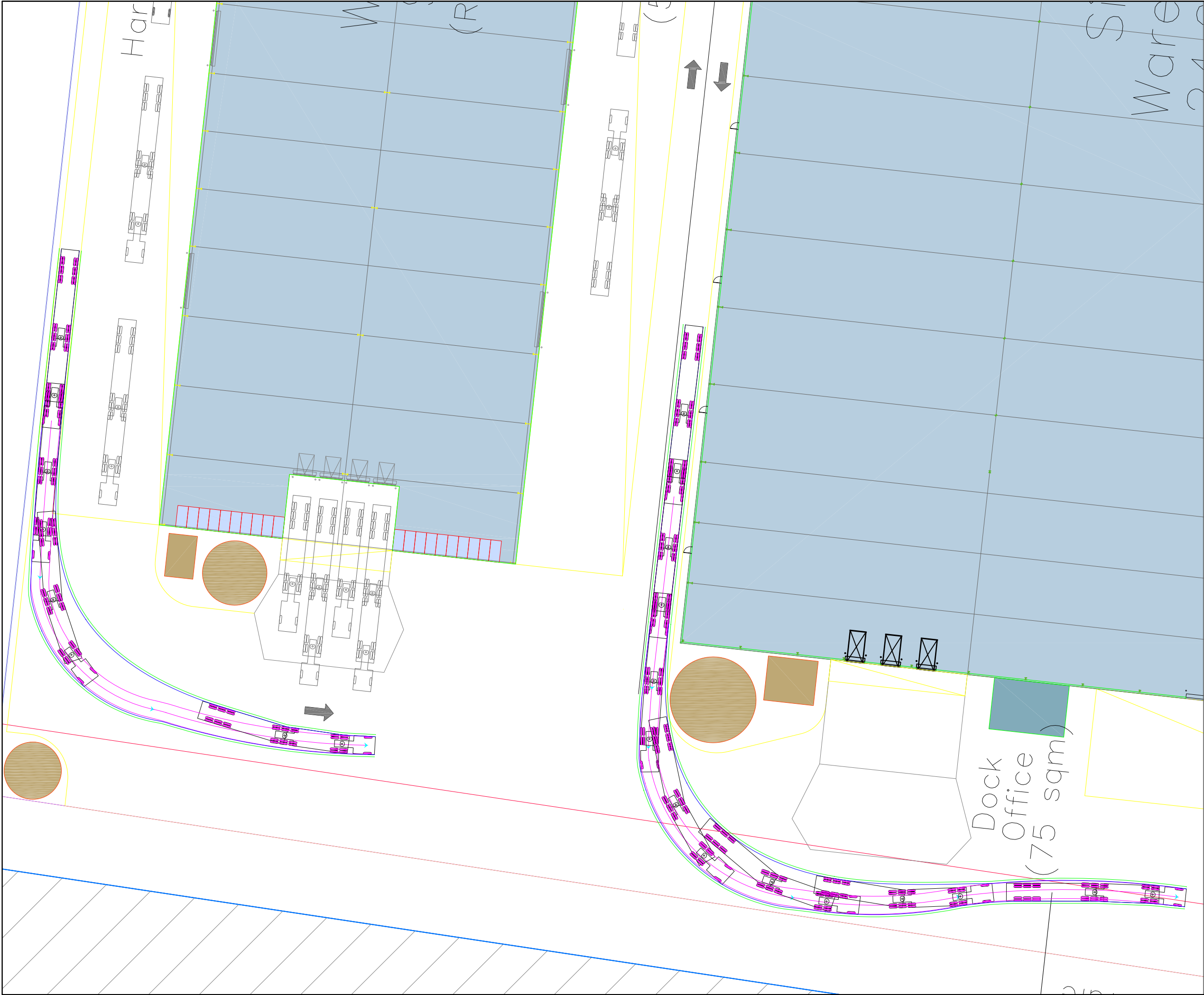
project  
Estate Works + DHL Project  
Oakdale Central  
Horsley Park

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drawing title  
25 M B-Double Swept Paths 2

drawn: checked: date:


10 097 project no. DA drawing phase. TX.02 drawing no. - rev




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no.	revision note	by.	date
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client  
**Goodman International**  
Level 10  
60 Castlereagh Street  
Sydney NSW 2000

scale  
1:500 @ A3  
m 0 5 10 15 20  


project  
**Estate Works + DHL Project**  
**Oakdale Central**  
**Horsley Park**

drawing prepared by  
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f: +61 2 9380 4481  
e: info@traffix.com.au  


drawing title  
**25 M B-Double Swept Paths 1**

drawn:	checked:	date:
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10 097 project no.	DA drawing phase.	TX.01 drawing no.	- rev
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