

DEXUS PROPERTY GROUP

TRAFFIC REVIEW OF PROPOSED
DEXUS ESTATE MASTERPLAN,
SOUTHERN EMPLOYMENT LANDS,
GREYSTANES

MARCH 2009

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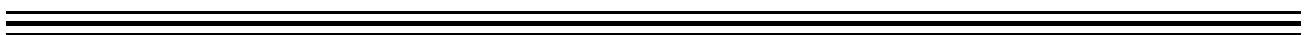
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1. INTRODUCTION

- 1.1 Colston Budd Hunt & Kafes Pty Ltd has been commissioned by Dexus Property Group to review the traffic aspects of the proposed DEXUS Estate Masterplan, located within the Southern Employment Lands at Greystanes (Greystanes SEL). The Greystanes SEL is located within the Greystanes Industrial Estate (identified for development under the framework of SEPP59 Western Sydney Employment). The site location is shown on Figure 1.
- 1.2 The Greystanes SEL is the subject of a concept plan approved by the Minister for Planning in 2007, and an amended approval in 2008. Dexus Property Group proposes to develop an industrial park on a 47 hectare portion of the Greystanes SEL. This review assesses the traffic aspects of the proposed Dexus Estate Masterplan. The review forms part of a project application under Part 3A of the Environmental Planning and Assessment Act 1979.
- 1.3 The regional and local traffic effects of the Greystanes SEL have previously been assessed through a number of studies. These include:-
- ❑ Regional Transport Requirements for Boral's Greystanes Estate (Sinclair Knight Merz, 1999);
 - ❑ Greystanes Estate Transport Plan (Environmental Resources Management Australia, 2000);
 - ❑ Boral Greystanes Estate, Local Traffic Study (Sinclair Knight Merz, 2001);
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- Greystanes Estate, Southern Employment Land Traffic and Transport Assessment, (Sinclair Knight Merz, 2006).

1.4 The traffic aspects of the proposed Dexus Estate Masterplan are reviewed through the following chapter.

2. TRAFFIC REVIEW

- 2.1. The Greystanes SEL is located on the former Prospect Quarry within the Greystanes Industrial Estate, in Western Sydney, as shown on Figure 1. The Greystanes Estate is approximately 330 hectares and comprises the Northern Employment Lands (Greystanes NEL), Residential Lands (Nelson's Ridge), Southern Employment Lands (Greystanes SEL) and open space areas. The Greystanes SEL occupies a total area of some 156 hectares.
- 2.2. To the north of the site is the predominantly established Greystanes NEL, comprising large warehouse/distribution centres and the Boral office building. Total development within the Northern Employment Lands, when fully complete, will comprise some 245,000m² of development.
- 2.3. In July 2007, the Minister for Planning approved a concept plan and project application for the Greystanes SEL. The approval was subsequently modified in January 2008. The concept plan approval (as modified) provides for the creation of an industrial and business park on the Greystanes SEL site. It is understood that quarrying within the Greystanes SEL will be completed within the next two years, at which time development within the SEL would be able to proceed.
- 2.4. The main access to the Greystanes Estate is provided via a north-south spine road through the estate (Reconciliation Drive). This road combines with Prospect Highway to connect to the M4 Western Motorway and the Great Western Highway located to the north of the estate. Currently Reconciliation Drive terminates to the south of Butu Wargun Drive. It has been constructed to provide a divided carriageway with one traffic lane in each direction, clear of
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intersections. The intersections of Reconciliation Drive with Prospect Highway/Reservoir Road and the M4 on/off ramps are controlled by roundabouts.

- 2.5. Butu Wargun Drive and Foundation Place are internal access roads within the estate, servicing the various warehouse/distribution centres located within the Greystanes NEL. These roads provide undivided roads with one traffic lane and one parking lane in each direction, clear of intersections. Butu Wargun Drive and Foundation Place intersect with Reconciliation Drive at roundabout controlled intersections.
- 2.6. In association with the development of the Greystanes SEL, Reconciliation Drive will be extended to connect to Widemere Road, located to the south of the estate. It will be upgraded to provide a divided carriageway, with two traffic lanes in each direction with right turn lanes provided to improve safety and intersection capacity. The main intersections within the estate will be signalised and the intersections of Prospect Highway with Great Western Highway, M4 Motorway and Reservoir Road will be upgraded to cater for the anticipated additional development traffic.
- 2.7. As part of the redevelopment of the Greystanes SEL, a bus transitway will be provided along Reconciliation Drive connecting Blacktown with the Liverpool to Parramatta Bus Transitway.
- 2.8. Dexus Property Group proposes to develop an industrial park on a 47 hectare portion of the Greystanes SEL. The traffic aspects of the proposed development have been reviewed through the following sections:-
- ❑ proposed development;
 - ❑ internal road network;
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- ❑ access arrangements;
 - ❑ parking provision;
 - ❑ b-double routes;
 - ❑ pedestrian network;
 - ❑ cycle network;
 - ❑ traffic generation and effects; and
 - ❑ summary.

Proposed Development

2.9. The development of an industrial park within the 47 hectare portion of the Greystanes SEL is generally consistent with the approved concept plan. The project involves:-

- ❑ subdivision of the site;
- ❑ construction of internal estate roads and site services;
- ❑ earthworks; and
- ❑ construction and use of industrial facilities (warehouse and distribution centres).

2.10 The proposed Masterplan for the project is shown on plans prepared by T Design Pty Ltd and Mackenzie Pronk Architects. The proposed Masterplan for warehouse and distribution facilities plus three alternative Masterplan layouts for the Dexus Estate have been prepared, to provide flexibility in the ultimate development of the site.

2.11 Masterplan options are based on the same internal road layout, broad subdivision layout, urban design and built form principles. The alternative Masterplan options have been considered in the environmental assessment, with the largest

components of the warehouse area and office area from the alternative Masterplan options, used as the basis for the traffic assessment. A development summary of the Masterplan options is shown in Table 2.1.

Areas (m²)	Masterplan	Alternative Option 1	Alternative Option 2	Alternative Option 3
Site Area	472,310	472,310	472,310	472,310
Warehouse Area	220,865	223,265	220,720	226,970
Office Area	20,900	26,225	25,040	22,670
Total	241,765	249,490	245,760	249,640

2.12 Access to the various facilities within the site will be provided via the construction of internal estate roads and the extension and upgrade of Reconciliation Drive through the Greystanes SEL. As previously noted, Reconciliation Drive will be extended to the south to connect into the Wetherill Park Industrial Area via Widemere Road. Intersections along Reconciliation Drive within the Greystanes SEL will be controlled by traffic signals. It is understood that, Boral will undertake these works within the Greystanes SEL in accordance with the Deed of Agreement.

2.13 The transport assessment for the Greystanes SEL (Sinclair Knight Merz, 2006) has previously been prepared in association with the approved concept plan. That report concluded that based on the net traffic generation from the estate not exceeding the traffic level from the Precinct Plan and Deed of Agreement, the surrounding road network incorporating the road improvements set out in the deed, would operate at an appropriate level of service.

Internal Road Network

- 2.14 The internal road network, as shown on Figure 2, is generally in accordance with the approved concept plan for the Greystanes SEL. The internal road network incorporates a logical hierarchy of road functions and appropriate design to facilitate vehicle, pedestrian and cycle activity. The internal road network will provide a mixture of collector roads and estate access roads.
- 2.15 In accordance with the approved concept plan and the Deed of Agreement, Reconciliation Drive will be extended to connect to Widemere Road located to the south of the estate. It will be upgraded to provide a divided carriageway, with two traffic lanes in each direction with right turn lanes provided to improve safety and intersection capacity. The three main intersections within the estate will be signalised and the intersections of Prospect Highway with Great Western Highway, M4 Motorway and Reservoir Road will be upgraded to cater for the anticipated additional development traffic. These works will be undertaken by Boral in accordance with the deed.
- 2.16 As part of the redevelopment of the Greystanes SEL, a bus transitway will be provided along Reconciliation Drive connecting Blacktown with the Liverpool to Parramatta Bus Transitway.
- 2.17 The estate access roads within the subject site will include Bellevue Circuit and Basalt Road. Bellevue Circuit will provide an undivided industrial road with one traffic lane and one parking lane in each direction, clear of intersections. It will circulate through the northern and eastern parts of the estate, providing access to the industrial developments. Bellevue Circuit intersects Reconciliation Drive at two locations to the north and south of the estate.
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- 2.18 Basalt Road will provide the main east-west access road through the estate linking Bellevue Circuit to Reconciliation Drive. It will incorporate a divided road with one traffic lane and one parking lane in each direction, clear of intersections.
- 2.19 The internal road network within the estate will be designed to accommodate industrial traffic, including b-doubles. These arrangements are considered appropriate to provide efficient and appropriate access to the proposed industrial development within the estate.

Access Arrangements

- 2.20 The proposed access arrangements for the various industrial developments within the estate will be designed to cater for the swept path of service vehicles including articulated vehicles and b-doubles. For the larger warehouse distribution centres, separate access driveways will be provided for staff/visitor parking and industrial traffic.
- 2.21 The final access arrangements will be determined at the time of the development applications for the individual sites, with access arrangements being designed in accordance with Australian Standards AS2890.1-2004 and AS2890.2-2002.

Parking Provision

- 2.22 Car parking provision within the Greystanes SEL will be determined at the time of the development applications for the individual sites. Car parking will be provided in accordance with the following approved parking rates:-
- Warehouse
 - one space per 300m² GFA; and

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- Commercial
 - one space per 40m² GFA.

B-Double Routes

- 2.23 Roads within the area approved for use by 25 and 26 metre b-doubles include the M4 Motorway, Great Western Highway, Prospect Highway, Blacktown Road, Reservoir Road, Reconciliation Drive, Widemere Road, Davis Road and Hassall Street. The existing approved routes are shown in the attached Figure 3.
- 2.24 In association with the development of the Greystanes SEL and the extension and upgrade of Reconciliation Drive through to Widemere Road, it would be appropriate to classify all roads within the Greystanes NEL and SEL for b-double access. The Roads and Traffic Authority's *"Route Assessment Guidelines for Restricted Access Vehicles"* outlines the procedure for having roads classified for b-double use.

Pedestrian Network

- 2.25 A network of pedestrian footpaths will be provided within the road reserves, and through landscape areas within the Greystanes SEL. The network will be incorporated into controlled pedestrian crossings at the three signalised intersections along Reconciliation Drive. Local roads within the site will have pedestrian footpaths on both verges.
- 2.26 The pedestrian and cycle networks will be designed to maximise clear and unobstructed sight lines at all crossing points. All path crossings will be at-grade incorporating pram ramps. Paths will be designed and constructed in accordance with the Australian Standards AS1428.
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Cycle Network

- 2.27 Cycleway provision will be made in the Transitway road reserve which is to be constructed by the Roads and Traffic Authority, as part of the Transitway works. This cycleway will link to the cycleway network north and south of the Greystanes Estate and integrate with "Bikeplan 2010" as issued by the Roads and Traffic Authority.

Traffic Generation and Effects

- 2.28 The traffic generated by the proposed development will have its greatest effects during the morning and afternoon periods when it combines with commuter traffic on the surrounding road network. Surveys undertaken by the Roads and Traffic Authority found the following two-way peak hour traffic generation rates for industrial/warehouse and commercial developments:-

- ❑ Warehouse
 - 0.5 vehicles per hour per 100m² GFA;
- ❑ Commercial
 - two vehicles per hour per 100m² GFA.

- 2.29 Based on these rates the proposed Masterplan would generate some 1600 to 1800 vehicles per hour two-way (in plus out) during the morning and afternoon peak periods. By way of comparison the previous traffic assessment (Sinclair Knight Merz, 2006) assessed a traffic generation for the overall development of some 4800 vehicles per hour two-way during peak periods, including a traffic generation of some 2700 to 2800 vehicles per hour two-way for the subject Masterplan area. Noting that the proposed development has some taller
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warehouse buildings of 25 metre and 40 metres in a few areas, compared to the approved concept plan of up to 15 metres, the proposed masterplan would be expected to generate considerably less traffic during peak periods than that was previously assessed.

2.30 In order to assess the operation of the three proposed signalised intersections on Reconciliation Drive within the Greystanes SEL, the traffic generated by the proposed development has been combined with the forecast traffic generated by the overall Greystanes Industrial Estate (NEL and SEL) for 2016. The forecast morning and afternoon peak period traffic flows within the Greystanes SEL are shown on Figures 4 and 5.

2.31 The operation of the proposed signalised intersections shown on Figures 4 and 5, incorporating the road network improvements set out in the Precinct Plan and Deed of Agreement, have been analysed using the SIDRA program. The program simulates the operation of the intersections to provide a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):-

□ For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:-

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive

			delays. Roundabouts require other control mode
>70	=	"F"	Unsatisfactory and requires additional capacity.

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to the following LOS:-

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode.

2.32 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.33 The SIDRA analysis found that the proposed signalised intersections through the Greystanes SEL would operate at levels of service C/D or better during the morning and afternoon peak periods by 2016. Average delays per vehicle were found to be less than 45 seconds per vehicle during peak periods. This represents a satisfactory level of intersection operation.

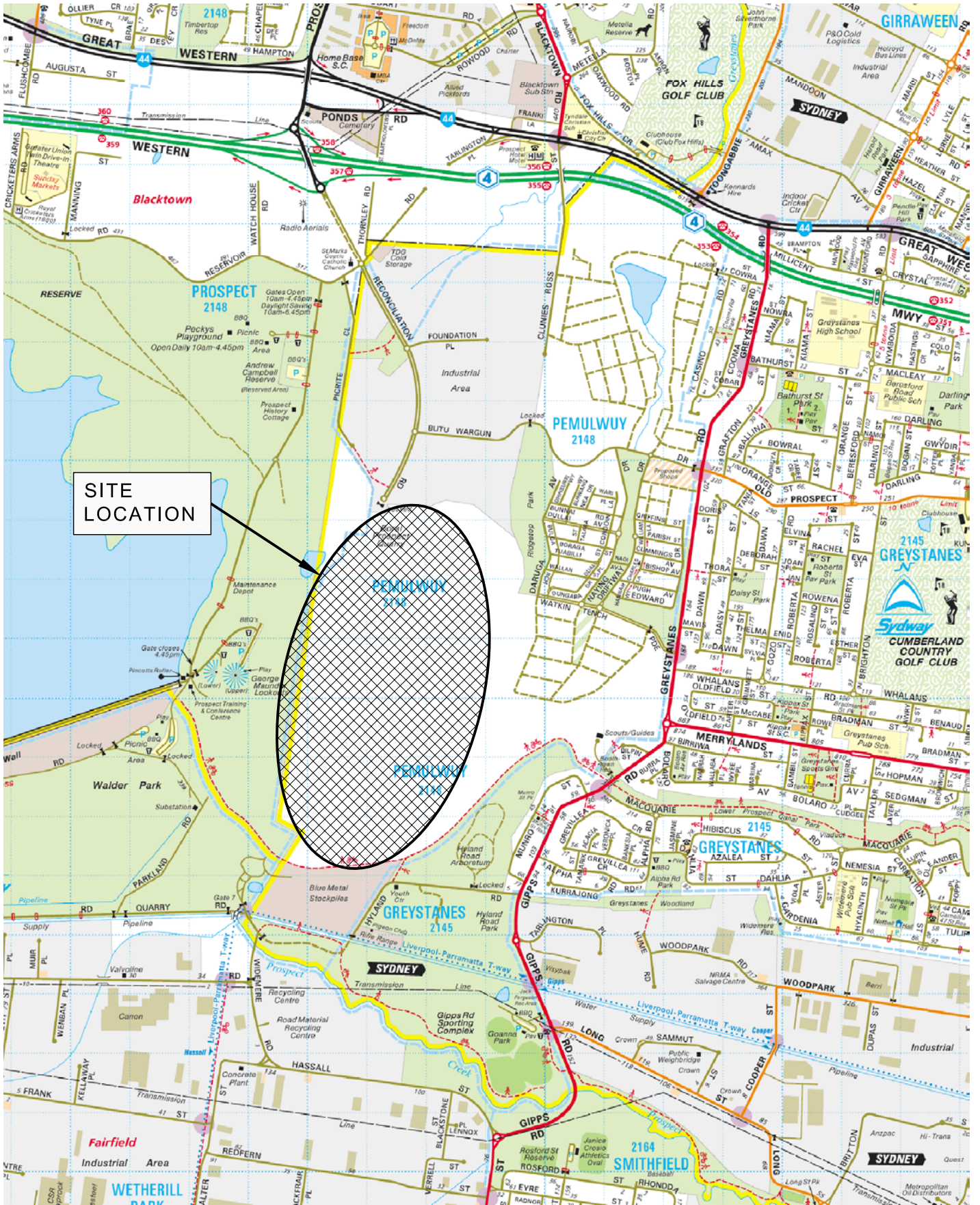
2.34 In summary, the proposed road network and its intersections, within the Greystanes SEL, will provide convenient and appropriate access for the proposed industrial development. In association with the road network improvements, vehicles will be able to access the various developments within the Masterplan site area, to and from the north and south, providing good access to the surrounding regional road network.

Summary

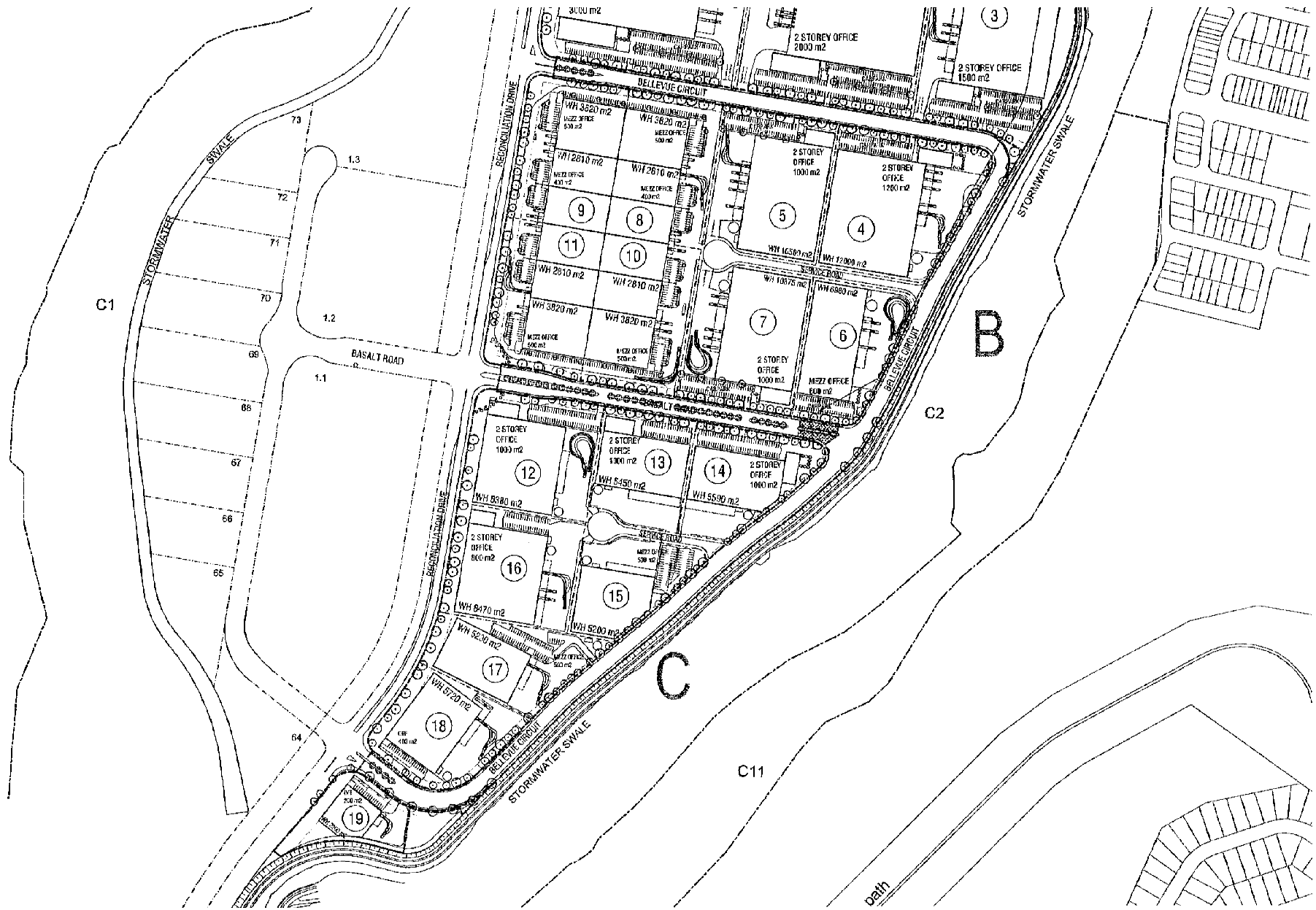
2.35 In summary, the main points relating to our review of traffic aspects of the proposed development are:-

- i) the site is located within the Greystanes SEL;
 - ii) in association with the development of the Greystanes SEL, Reconciliation Drive will be extended to the south and upgraded to provide a four lane divided carriageway, with two traffic lanes in each direction, clear of intersections;
 - iii) main intersections along Reconciliation Drive within the estate will be signalised;
 - iv) it is understood that Boral will undertake the works outlined in ii) and iii) in accordance with the Deed of Agreement;
 - v) the internal road network within the estate will be designed to accommodate industrial traffic, including b-doubles;
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- vi) the proposed access and car parking arrangements will be designed in accordance with the Australian Standard AS2890.1-2004 and AS2890.2-2002;
 - vii) the pedestrian and cycle network will be designed in accordance with the Australian Standard AS1428;
 - viii) the regional and local traffic effects of the Greystanes SEL have previously been assessed (Sinclair Knight Merz 2006);
 - ix) the proposed development is expected to generate considerably less traffic during peak periods than was previously assessed;
 - x) the proposed road network and its intersections, incorporating the proposed network improvements within the overall Greystanes Industrial Estate, set out in the deed, will be able to cater for the proposed development traffic.
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Location Plan



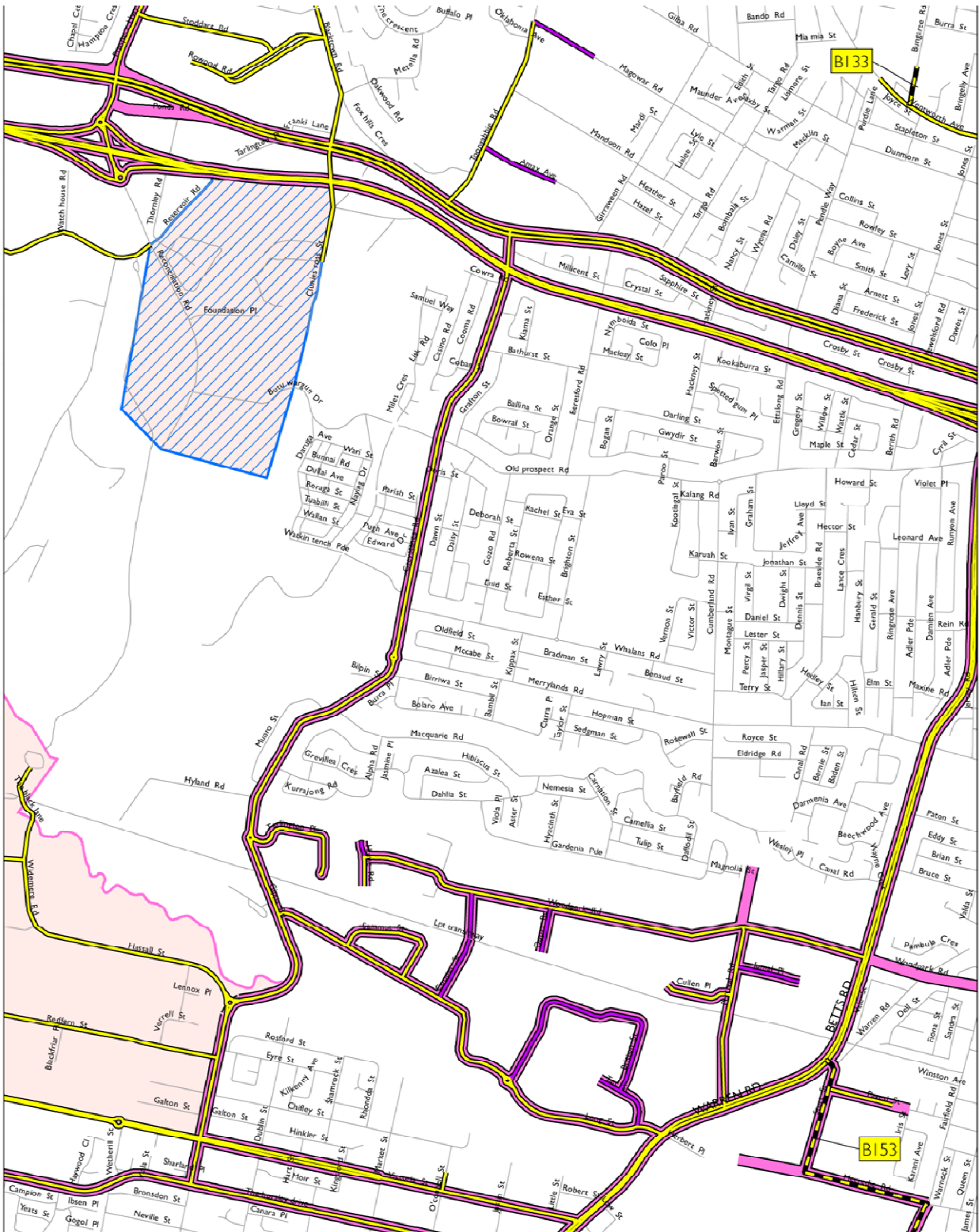
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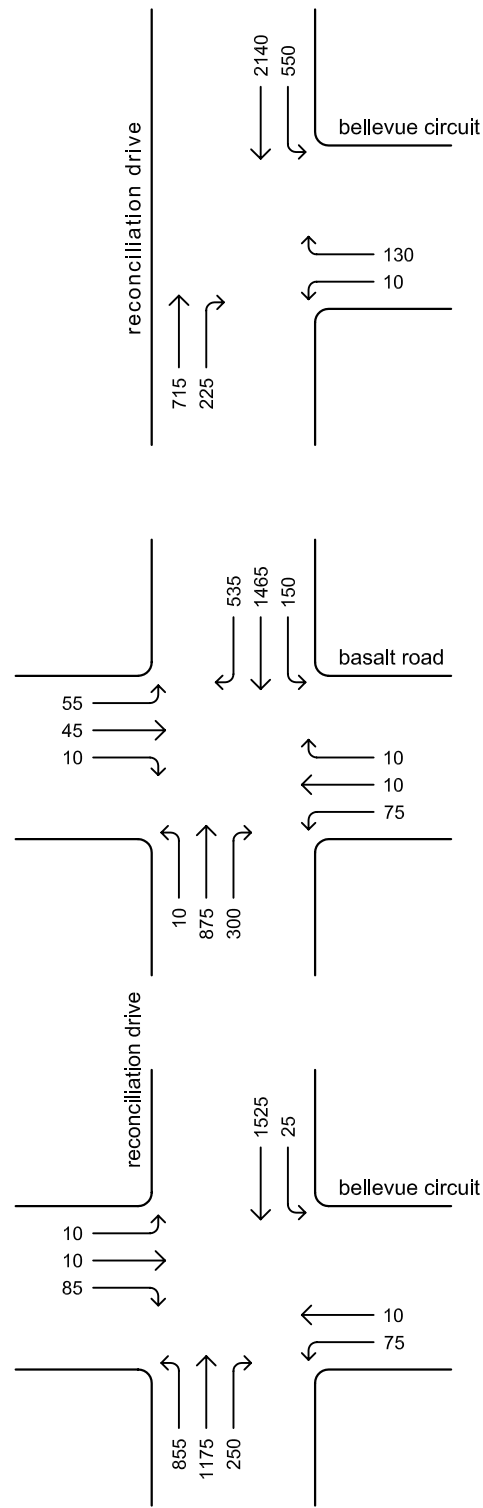


TRAVEL RESTRICTIONS VEHICLE ROUTES	Sydney Area Greystanes Scale 1:25,000 0 0.15 0.3 0.6 Kilometres	LEGEND B-Double 25/26m Approved Routes 23m Approved Routes 19m Approved Routes B-Double Approved Zones 4.6m High Vehicle 4.6m High Vehicle Routes 1.6m High Vehicle Approved Zones	Restrictions For the following restriction details see Travel Restrictions Table. B133 B-Double Restriction H13 4.6m High Vehicle Restriction Classified Roads Local Roads Regional Roads State Roads
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Map valid to 15 August 2008

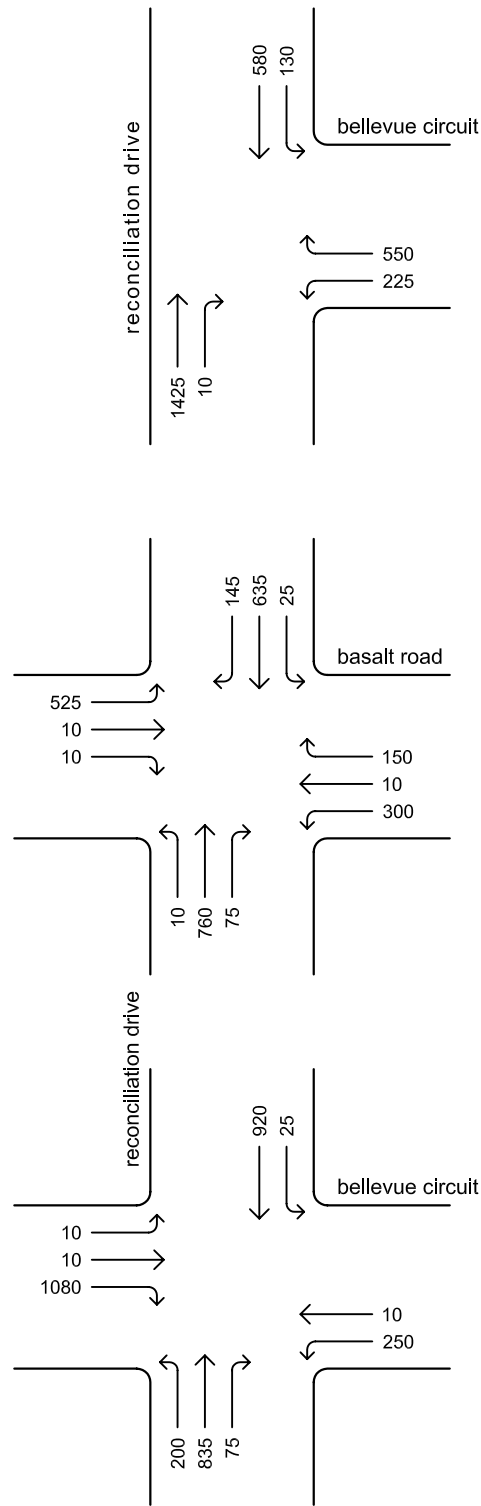
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travel restrictions vehicle routes



Source -
Based on modified Sinclair Knight
Merz, 2006 forecast traffic flows

**Forecast morning peak hour 2016
traffic flows**



Source -
Based on modified Sinclair Knight
Merz, 2006 forecast traffic flows

**Forecast afternoon peak hour 2016
traffic flows**