

**PROPOSED RESOURCE
RECOVERY AND LANDFILL FACILITIES
QUARRY ROAD, EASTERN CREEK**

***Traffic Impact
Assessment***

April 2008

Reference 07323

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EXECUTIVE SUMMARY

The former “Pioneer” site at Eastern Creek has been subject to an historical operation and use for quarrying, concrete production, asphalt production, transport logistics and related activities. With the recent cessation of the quarry use it is proposed to locate the other uses onto the subdivided southern part of the site.

The northern part, contains a large open quarry and provides an ideal opportunity for Resource Recovery Facility (RRF) and Landfill (LF). Light Horse Waste Management (LHWM) propose to construct and operate these facilities including a Materials Processing Centre and Waste Transfer Station (MPC and WTS) on this part of the site and the project will provide landfill for some 20 years with an ongoing life for the RRF. The facility will have the capacity to accept up to 2 million tonnes of waste per year and will recycle some 1.0 to 1.6 million tonnes per year with the residue being used for landfill on the site.

Planning for the development of the Eastern Creek Precinct has included detailed traffic generation and road network analyses to ensure a satisfactory traffic outcome for the envisaged development on the precinct lands. Assessment of the proposed development has concluded that the traffic generation of these uses will only be some 14% of that which was in fact assumed for the site in the studies undertaken by Council and the RTA for the development and operation of the road system.

The vehicle access and internal circulation arrangements for the proposed development will be suitable and appropriate while assessment has shown that the traffic outcome of the construction process will be quite satisfactory and subject to the identified amelioration measures.

The assessment has concluded that there will be no adverse traffic or transport implications to the proposed construction and/or operation of the proposed resource recovery and landfill development.

1. INTRODUCTION

ThaQuarry Pty Ltd and ACN 114 843 453 Pty Ltd seek project approval for the construction and operation of a Resource Recovery Facility including a materials processing centre (MPC) and waste transfer station (WTS) and a Class 2 inert and solid waste landfill at Eastern Creek, in Sydney's west. Project approval is sought from the NSW Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act). The application process is to be managed on behalf of both parties by ThaQuarry Pty Ltd under the project name Light Horse Business Centre.

Transport and Traffic Planning Associates (TTPA) has been engaged by Environmental Resources Management (ERM) on behalf of the proponent to assess the potential traffic and transport impacts of the project, as part of the overall environmental assessment.

The site (Figure 1) is located within the 'Eastern Creek Precinct' of the Central Western Sydney Employment Area which is subject to the provisions of State Environmental Planning Policy (SEPP) 59 Central Western Sydney Economic. The *Eastern Creek Precinct Plan* (Precinct Plan) was prepared under the provisions of the SEPP to guide the development of land within the Eastern Creek Precinct and this Plan along with the RTA's plan for the Erskine Park Link Road network have been considered during project planning.

Pioneer formerly operated a quarry on the site, however that quarry has now reached the end of its economic life and all quarrying activities ceased in September 2006 although the quarry void remains.

In summary, the proposed development will comprise:

- * 3 stages of construction namely:
 - preconstruction
 - general construction
 - commissioning

- * receipt of up to 2 million tonnes per annum (mtpa) of inert and solid wastes from construction and demolition (C&D), commercial and industrial (C&I) waste streams complying with acceptable waste of non putrescible Class 2 facilities and green waste clean ups
- * sorting, processing and storage/ stockpiling of wastes
- * recovery of recyclable material estimated to comprise 50-80% of incoming waste (1 to 1.6 mtpa, based on maximum capacity intake), and resale, predominantly to the building, landscaping and construction sectors
- * landfill of non-recoverable materials estimated to comprise 20-50% of incoming waste (0.4 to 1 mtpa, based on maximum capacity intake) within the quarry void
- * quarantine and transfer of any non complying wastes to an appropriate offsite facility for disposal.

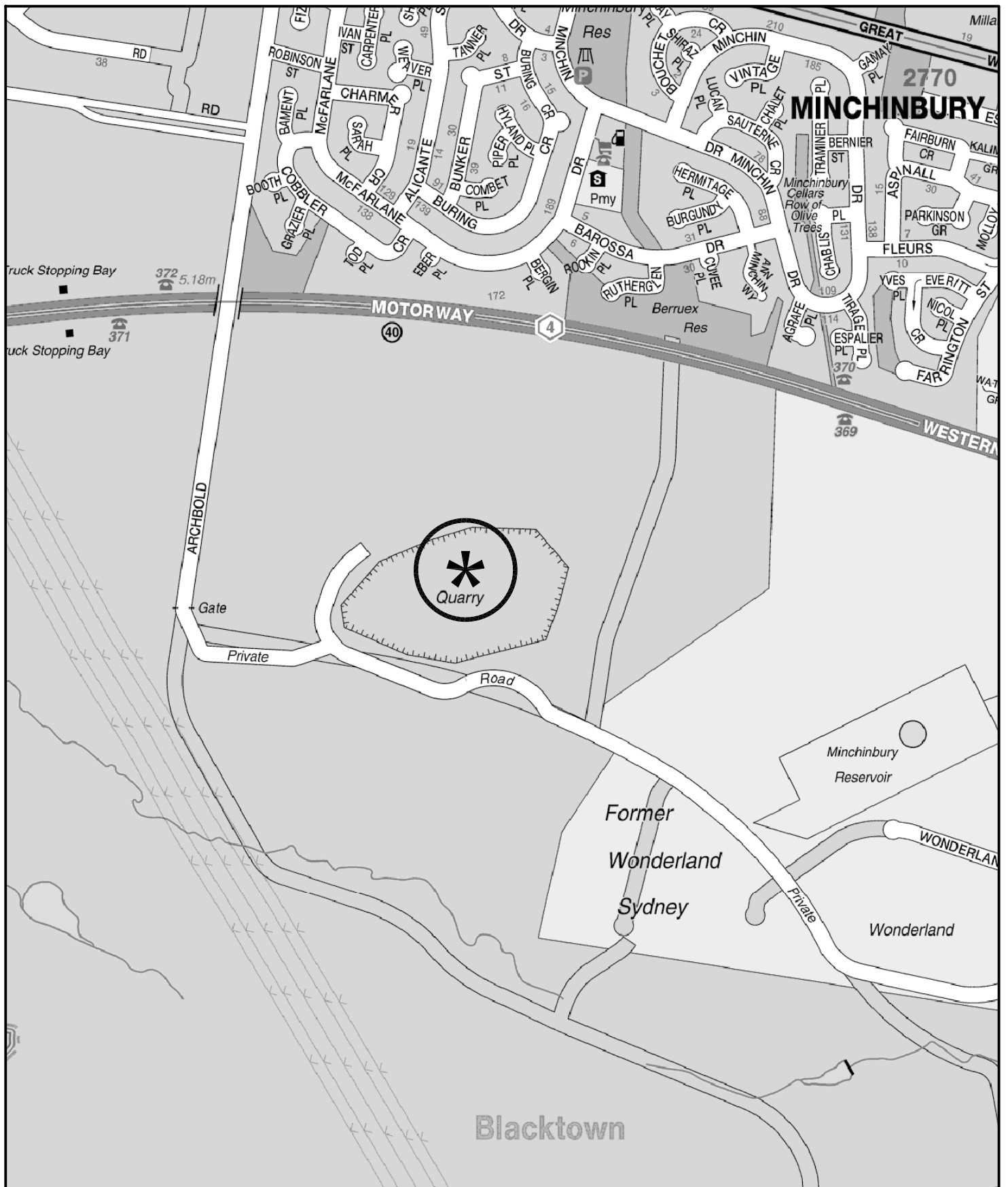
The Director General's Requirements for the project include:

- ***Traffic and Transport*** – including details of traffic volumes likely to be generated during construction and operation and an assessment of the predicted impacts of this traffic on the safety and capacity of the surrounding road network, including the Old Wallgrove Road/Wallgrove Road intersection;
- ***Consultation*** – Blacktown City Council, Roads and Traffic Authority

The purpose of this report is to:

- * describe the site, the existing/prior operations and the proposed redevelopment
- * describe the road network serving the site and the prevailing traffic conditions
- * describe the proposed future road network and projected traffic conditions

- * assess the potential traffic and transport implications of the project
- * assess the suitability of the proposed vehicle access and internal circulation
- * assess the need for amelioration measures
- * assess and respond to any issues raised by the RTA and Council.



LEGEND



LOCATION

FIG 1

2. PROPOSED DEVELOPMENT SCHEME

2.1 SITE AND CONTEXT

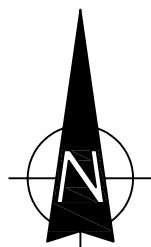
The total former Pioneer site is a consolidation of Lot W of Deposited Plan (DP) 419612, Lot 1 of DP 400697, Lot 2 of DP 262213 and Lot 10 of DP 241859, and occupies an area of 121.6 hectares (ha). Vehicle access is provided by a private road (right-of-carriageway №. D227638) that connects to Old Wallgrove Road and an application for subdivision of the lots has been lodged with Blacktown City Council. Hanson currently leases part of Lot 2 of DP 262213 (Asphalt Batching Operations), Lot W of DP 419612 (Haul Road and operations) and Lot 1 of DP 400697 (Office & Workshop) and a separate application has been lodged with the Minister for Planning relating to proposed redevelopment of this land.

The site, which is situated within the Stage 3 Release Area of the Eastern Creek Precinct, is located in close proximity to the arterial road network including Westlink M7, M4 Motorway and the Great Western Highway. The operational part of the site which is subject to the proposed RRF and LF (Figure 2) comprises an area of some 44 ha which contains the large excavated quarry (being some 150 metres deep with an estimated volume of 11 million m³) along with an existing weighbridge, disused sheds and unsealed roads.

The site is bounded to the north by lands adjacent to the M4 Motorway and to the west by undeveloped open grazing land along Archibold Road which also extends along the southern and part of the eastern boundaries. Land occupied by the Hanson Construction Materials Pty Ltd extends along the south-eastern boundary with operations which include crushing, processing, stockpiling and transport of materials for the building and construction industry.



LEGEND



SITE

FIG 2

2.2 PRIOR USE

The historical use and operation of the site has included:

- * extractive hard rock quarrying including aggregates storage and distribution
- * concrete recycling including crushing, screening and blending facilities
- * storage of cement and cement products
- * asphalt production and sales including bitumen storage
- * transport/logistics depot and workshop with fuel storage and weighbridge
- * technical laboratories associated with concrete and asphalt production
- * offices.

The established total truck movements associated with the uses on the Pioneer site over recent years are some 390,000 trips per annum (tpa) comprising:

* quarry	70,000
* aggregate storage and distribution	45,000
* premix concrete	80,000
* asphalt	115,000
* recycled products	20,000
* logistics	60,000
Total	390,000 tpa

The quantum and nature of the traffic movements into and out of the entire site in 2006 was established by a program of 'automatic' vehicle recording at the point of access on the right-of-way. The 7 day average total of trips into and out of the site over the survey periods was 1,065 which equates to some 389,000 trips per annum while the export of quarried product in 2006 involved some 70,000 tpa or 240 tpd.

The 'make up' of these 2006 movements in terms of vehicle classifications, as defined in Appendix A, was as follows:

Light vehicles (Classes 1 and 2)	-	45%
Medium vehicles (Classes 3, 4 and 5)	-	30%
Long vehicles (Classes 6, 7, 8 and 9)	-	24%
B Double (Class 10)	-	1%
Total	-	100%

Because the quarry was at the end of its extractive life and other uses (Hanson) were operating at reduced levels the recorded 2006 traffic movements were significantly less than the former annualised frequency. In order to establish the former operational circumstances the recorded movements have been 'factored up' to represent the annualised rate to provide the following representative former peak traffic circumstances during the morning and afternoon periods.

	Morning		Afternoon	
	7-8am	8-9am	4-5pm	5-6pm
Total Trips	126	91	100	67

2.3 PROPOSED DEVELOPMENT

The development proposal is for the construction and operation of a Resource Recovery Facility and Landfill and the proposed site layout is identified on the plan overleaf. The construction process will involve:

Stage 1: Preconstruction

This process will include engineering design, installation of services and chainage and upgrade of access roads.

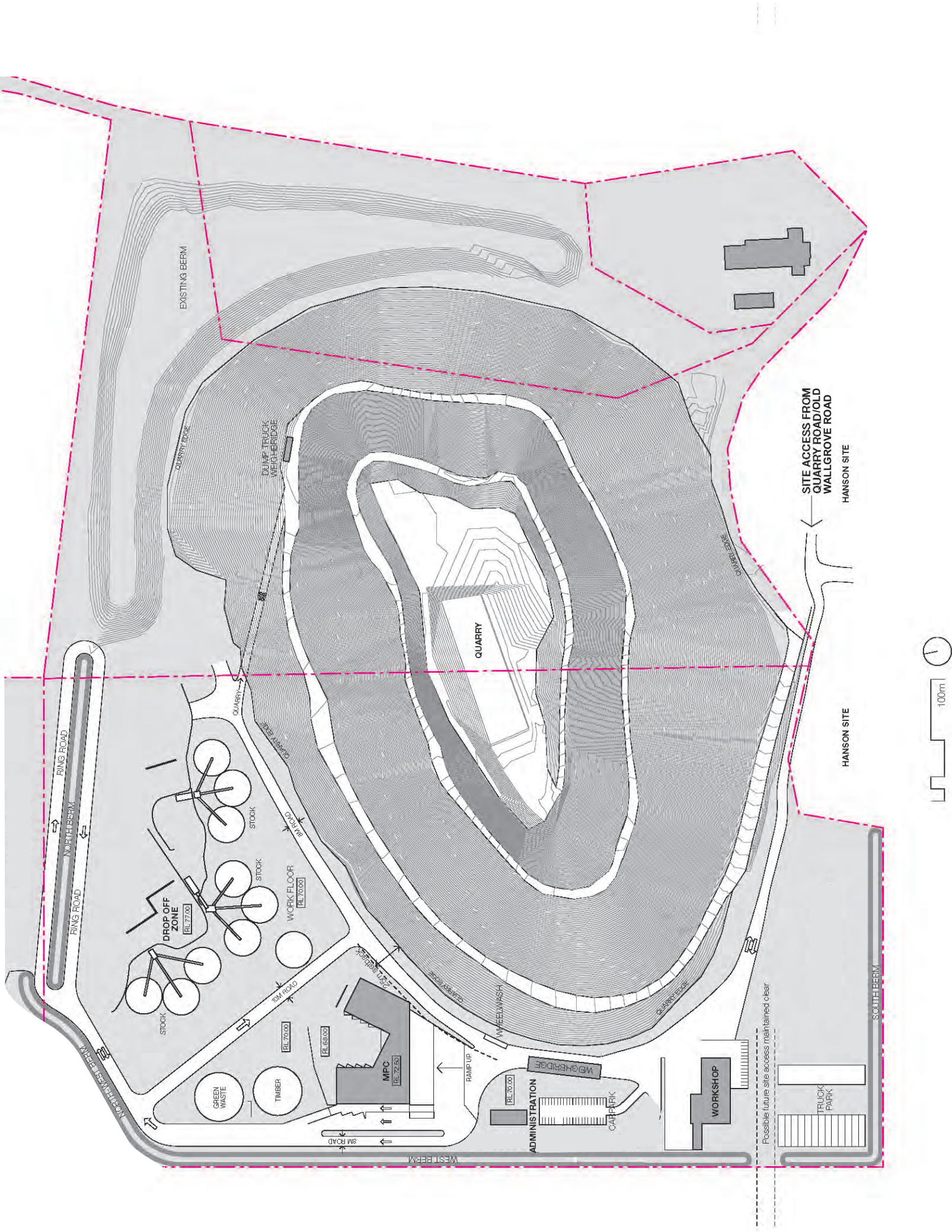
Stage 2: General Construction

This process will include:

- * excavation of footing and foundations
- * construction and refurbishment of buildings
- * construction of treatment plant, water storage and stormwater pond.

Light Horse Waste Management and Landfill Facility

Proposed Site Layout



Stage 3: Commissioning

This process will include erection of fencing, testing of equipment and plant and training of personnel.

The total construction process will take some 6 months and will involve some 30 workers with work undertaken Monday – Friday (7.00am to 6.00pm) and Saturday (7.00am to 1.00pm). Vehicle access during this period will be along the existing access road to/from Old Wallgrove Road. The volume of vehicle movements will vary during the process, however this will not exceed the future operation movement at any time.

The Resource Recovery Facility will include a Materials Processing Centre and Waste Transfer Station including the recommissioning of the existing weighbridge. The proposed operation of the RRF is summarised in the following:

- * capacity to receive up to two million tonnes of waste per annum onto the site, including inert and solid wastes from construction and demolition (C&D), commercial and industrial (C&I) waste streams complying with acceptable waste of non putrescible Class 2 facilities and green waste clean ups
- * on-site waste processing including sorting, screening, sieving, crushing, grinding, shredding and/or chipping, and composting of green waste
- * recycling of an estimated 50-80% of incoming waste (1 to 1.6 mtpa, based on maximum capacity intake) eg to produce road base, aggregate, landscaping soil, bedding sand, mulch, wood chip, green waste compost and asphalt derived products for land application
- * testing and on-site storage/stockpiling of finished products prior to resale from stockpiles, predominantly to the building, construction and landscaping sectors and potentially the domestic market
- * transport of an estimated 20-50% of incoming waste (0.4 to 1 mtpa, based on maximum capacity intake) to the landfill facility within the quarry void, comprising of incoming materials which are unsuitable or uneconomical for

recovery and recycling (for example, contaminated soils, asbestos waste and loads that are so mixed they cannot physically be sorted)

- * quarantine and transfer of unacceptable wastes to an appropriate offsite facility for disposal.

Vehicle access via the existing right-of-carriageway will be utilised until the future precinct access road system is available.

The Landfill Facility will have a projected life of 20 years while the RRF will be ongoing. There will be some 49 staff employed on the site along with contractors as necessary, operating 7 days per week (6.00am to 6.00pm). The RRF may receive materials after 10.00pm infrequently (eg once per 10 weeks) from essential works such as night roadworks.

The assessed vehicle movements which will be generated by the operation of the RRF and LF will vary depending on the level of material recovered (and not used for landfill). These movements will include receipt of waste, dispatch of recycled products, general site delivery and the light vehicle movement of staff, contractors and visitors. Details of the minimum and maximum vehicle movement scenarios are provided on the schedules prepared by ERM which are reproduced overleaf and summarised in the following:

	Light	Medium	Heavy	Total
<u>Minimum Resource Recovery Rate</u>				
Peak hour	18	23	43	84
Daily	196	222	430	848
Annual	68,600	77,700	150,500	296,800
<u>Maximum Resource Recovery Rate</u>				
Peak hour	20	26	50	96
Daily	220	254	498	972
Annual	77,000	88,900	174,300	340,200

Operational Traffic Generation - Best Case Traffic i.e. maximum landfilling rate of 1mtpa

Activity	Description	Capacity (t)	Site Visits			Daily Movements			Peak Hour Movements		
			Light	Medium	Heavy	Light	Medium	Heavy	Light	Medium	Heavy
Staff Movements	Utes/ cars	n/a	38	-	-	76	-	-	2	-	-
Subcontractors	Utes/ cars	n/a	4	-	-	8	-	-	4	-	-
Site Visitors	Utes/ cars	n/a	4	-	-	8	-	-	1	-	-
Waste Deliveries	Utes	1	31	-	-	62	-	-	6	-	-
	Boogie, large skips, and morel bodies	12.5	-	41	-	-	82	-	-	8	-
	Other vehicles (small-medium bins)	7	-	42	-	-	84	-	-	8	-
	walking floors	25	-	-	60	-	-	120	-	-	12
	truck and dog	32.5	-	-	65	-	-	130	-	-	13
	B-double	40	-	-	32	-	-	64	-	-	6
Bulk Product Dispatch from Stockpiles			19	27	57	38	54	114	4	5	11
General Deliveries (fuel, workshop	Ute/ cars	n/a	2	-	-	4	-	-	1	-	-
and administrative supplies, service	Flattop Truck	n/a	-	1	-	-	2	-	-	1	-
and maintenance activities etc)	Semi/ B-double	n/a	-	-	1	-	-	2	-	-	-
TOTAL			98	111	215	196	222	430	18	23	43
TOTAL ANNUAL MOVEMENTS											
	Light Vehicles	68,600									
	Medium Vehicles	77,700									
	Heavy Vehicles	150,500									
	ALL VEHICLES	296,800									

Daily Volume Waste Received = 5730 t

NB. This assumes 15% backloading efficiency for heavy vehicles delivering waste to the site and 10% backloading efficiency for light and medium delivery vehicles
Assume 1.2 employees/ vehicle for staff movements

Light Horse Business Centre

Predicted Operational Traffic Generation, Maximum Waste Intake (2,000,000 t/ annum) and Maximum Resource Recovery Rate (1,000,000 t/ annum)

Activity	Description	Capacity (t)	Site Visits			Daily Movements			Peak Hour Movements		
			Light	Medium	Heavy	Light	Medium	Heavy	Light	Medium	Heavy
Staff Movements	Utes/ cars	n/a	38	-	-	76	-	-	2	-	-
Subcontractors	Utes/ cars	n/a	4	-	-	8	-	-	4	-	-
Site Visitors	Utes/ cars	n/a	4	-	-	8	-	-	1	-	-
Waste Deliveries	Utes	1	31	-	-	62	-	-	6	-	-
	Boogie, large skips, and morel bodies	12.5	-	41	-	-	82	-	-	8	-
	Other vehicles (small-medium bins)	7	-	42	-	-	84	-	-	8	-
	walking floors	25	-	-	60	-	-	120	-	-	12
	truck and dog	32.5	-	-	65	-	-	130	-	-	13
	B-double	40	-	-	32	-	-	64	-	-	6
Product Dispatch from Stockpiles			31	43	91	62	86	182	6	9	18
General Deliveries (fuel, workshop and administrative supplies, service and maintenance activities etc)	Uter cars	n/a	2	-	-	4	-	-	1	-	-
	Flattop Truck	n/a	-	1	-	-	2	-	-	1	-
	Semi/ B-double	n/a	-	-	1	-	-	2	-	-	-
TOTAL			110	127	249	220	254	498	20	26	50
TOTAL ANNUAL MOVEMENTS											
Light Vehicles			77,000								
Medium Vehicles			88,900								
Heavy Vehicles			174,300								
ALL VEHICLES			340,200								

Assumptions (based on information supplied by proponent):

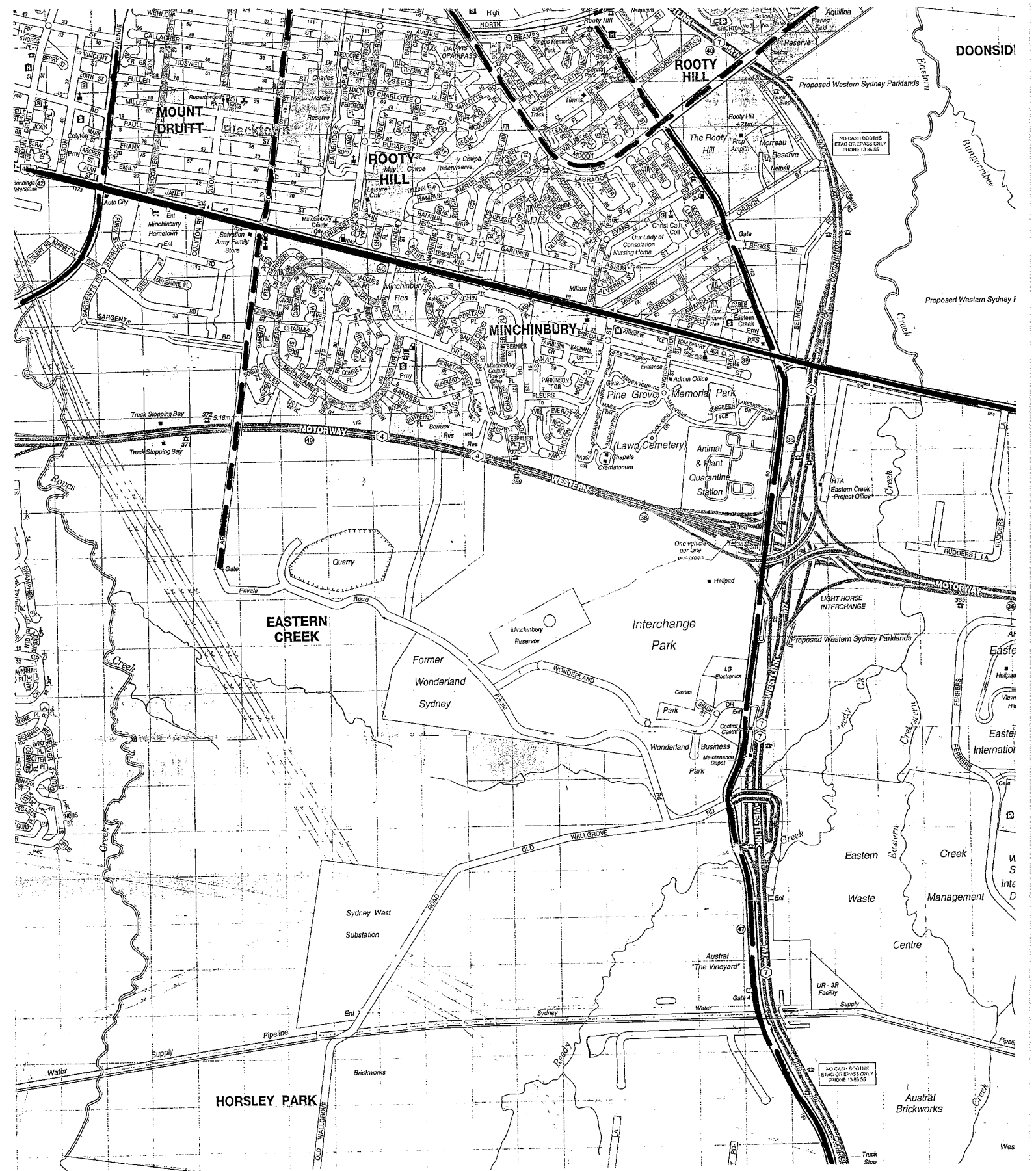
- 15% backloading efficiency for heavy vehicles delivering waste to the site and 10% backloading efficiency for light and medium delivery vehicles
- 1.2 employees/ vehicle for staff movements
- Dispatch Recovered Materials: 85% dispatched by heavy vehicles (40 t capacity (40%)), 32.5 t capacity (50%), 25 t capacity (10%); 12% medium vehicles (12.5 t capacity (80%)), 7 t capacity (20%); 3% light (utes (15%), morel lights (85%))
- Incoming Waste: 85% delivered by heavy vehicles (B-double numbers are half those of other heavies), 14.5% medium vehicles, 0.5% light vehicles
- Peak Hour movements for Delivery and Dispatch are 10% of total daily movements
- Non-complying materials dispatch - 100% backloading
- Delivery and dispatch occurs 350 days/ year, with equal volumes of materials transported each day (i.e. 5730 t waste delivered/ day and 4572 t waste dispatched/ day)
- Shift changeover times for the majority of site staff are outside of peak hour times for the surrounding road network, contributing to the low peak hour movements for staff

3. EXISTING ROAD NETWORK AND TRAFFIC CONDITIONS

3.1 ROAD NETWORK

The road network serving the site (Figure 3) comprises:

- * *Westlink M7* – a privately owned and operated Motorway, which forms part of the Sydney Orbital Route and connects between the South-Western Freeway at Prestons and the M2 Motorway at Seven Hills. This Motorway has 2 lanes in each direction with a 100 kmph speed limit
- * *M4 Motorway* – a State Road and major arterial route connecting between Sydney and the Blue Mountains crossing. This Motorway has sections of 4 and 6 lanes divided with an 80 kmph speed limit
- * *Great Western Highway* – a State Highway and arterial route connecting between Sydney and Penrith. This Highway has sections of 4 and 6 lanes and the speed limit varies between 60 and 80 kmph
- * *Wallgrove Road* – a State Road and sub-arterial route connecting between the Great Western Highway and Elizabeth Drive. The roadway has sections of 2 and 4 lanes with an 80 kmph speed limit
- * *Archibold Road* – a minor collector road connecting over the M4 to Great Western Highway (access is currently restricted in the section south of the M4)
- * *Old Wallgrove Road* – a local access roadway connecting to Wallgrove Road and the M7.



3.2 TRAFFIC CONTROLS

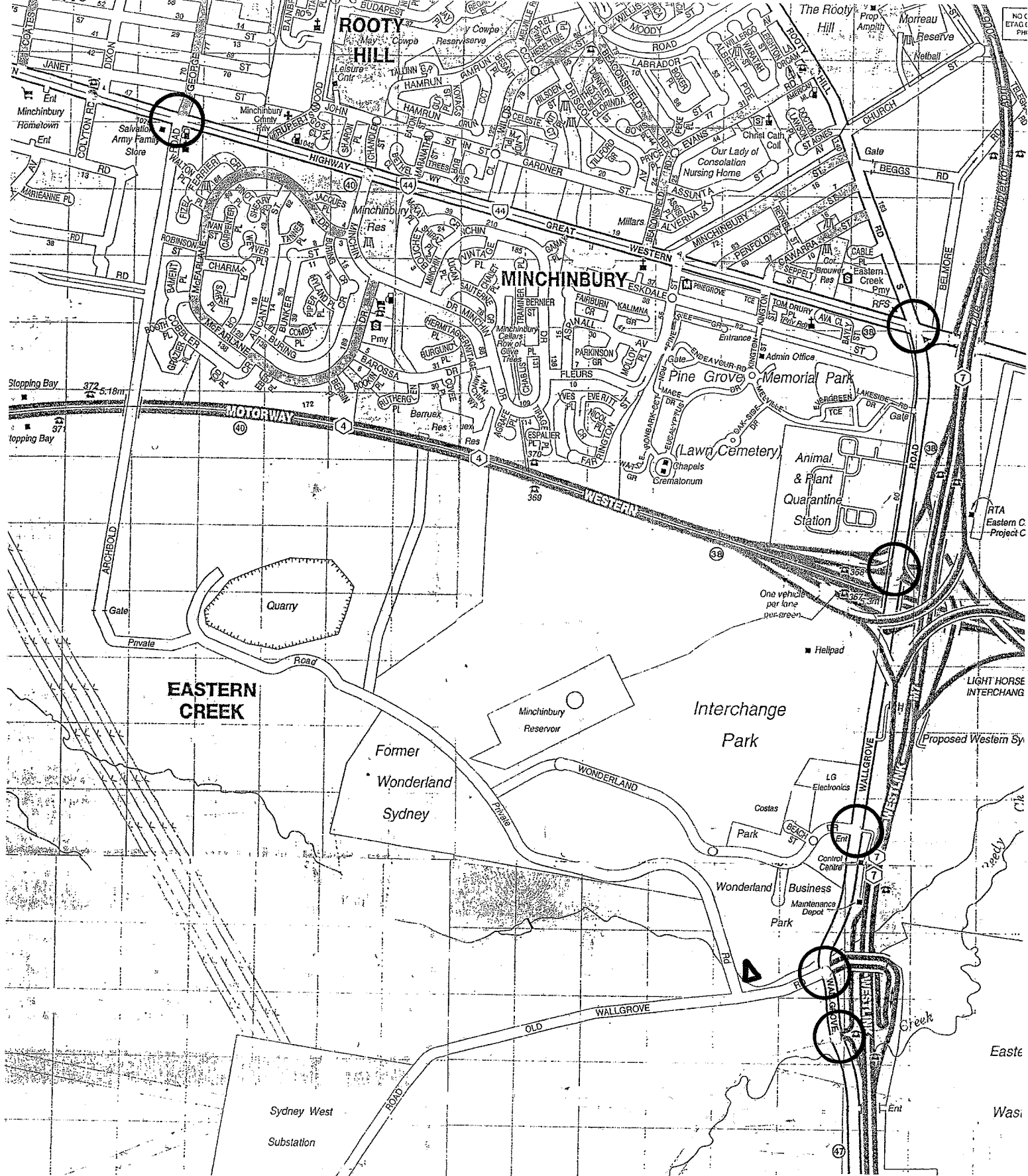
The principal existing traffic controls on the road system in the vicinity of the site (Figure 4) comprise:

- * the traffic signals at the Wallgrove Road, Old Wallgrove Road and southbound M7 ramp intersection. Details of this intersection arrangement are provided in the diagram provided in Appendix B
- * the traffic signals at the Wallgrove Road and northbound M7 ramps intersection
- * the traffic signals at the Wallgrove Road and Wonderland Drive intersection and at the M7/M4 ramp intersections
- * the traffic signals along the Great Western Highway including the Wallgrove Road and Archibold Road intersections
- * the GIVE WAY sign control on Quarry Road (private ROW) at Old Wallgrove Road
- * the RTA approved 'B Double' truck routes along Wallgrove Road and Old Wallgrove Road.

3.3 TRAFFIC CONDITIONS

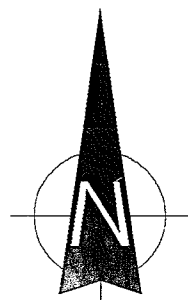
The opening of the Westlink M7 Motorway has resulted in significant relief to the road network which serves Eastern Creek. In particular, it has allowed for the redistribution of traffic flows out of Wallgrove Road and eased conditions at the major M4 and Great Western Highway intersections.

Vehicle access to/from Old Wallgrove Road is facilitated by the traffic signals at the Wallgrove Road intersection and the ramps to/from the M7. These connections along with the new interchanges between the M7 and M4 and Great Western Highway ensure ready access to/from the arterial road system.



LEGEND

- TRAFFIC SIGNALS
- △ GIVE WAY



TRAFFIC CONTROLS

FIG 4

The results of traffic surveys undertaken at the Wallgrove Road/Old Wallgrove Road and Old Wallgrove Road/Quarry Road intersections during the morning and afternoon peak periods are provided in Appendix C and summarised in the following:

		AM	PM
Wallgrove Road	Northbound	737	1169
	Right-turn	11	3
	Left-turn	132	32
	Southbound	906	640
	Right-turn	157	43
	Left-turn	114	-
Old Wallgrove Road	Eastbound	26	24
	Right-turn	52	80
	Left-turn	87	97
	Westbound	54	14
	Right-turn	11	9
	Left-turn	35	4
Old Wallgrove Road	Eastbound	104	148
	Left-turn	14	4
	Westbound	168	48
	Right-turn	42	29
Quarry Road	Right-turn	10	4
	Left-turn	46	56

3.4 TRANSPORT SERVICES

Rail services are available at Rooty Hill Station which is some 4 kms from the site. The only existing bus service in the vicinity of the site is the Busways Route 739 which connects between Mount Druitt and Minchinbury. This service runs along McFarlane Drive with 30 minute peak frequencies and this is located within convenient walking distance of the site.

4. FUTURE ROAD NETWORK AND TRAFFIC CONDITIONS

4.1 ROAD NETWORK

The proposed network for the Eastern Creek Precinct development, as identified in the SEPP 59 Precinct Plan document, is reproduced in Figure 5. Access road connections for the area will involve:

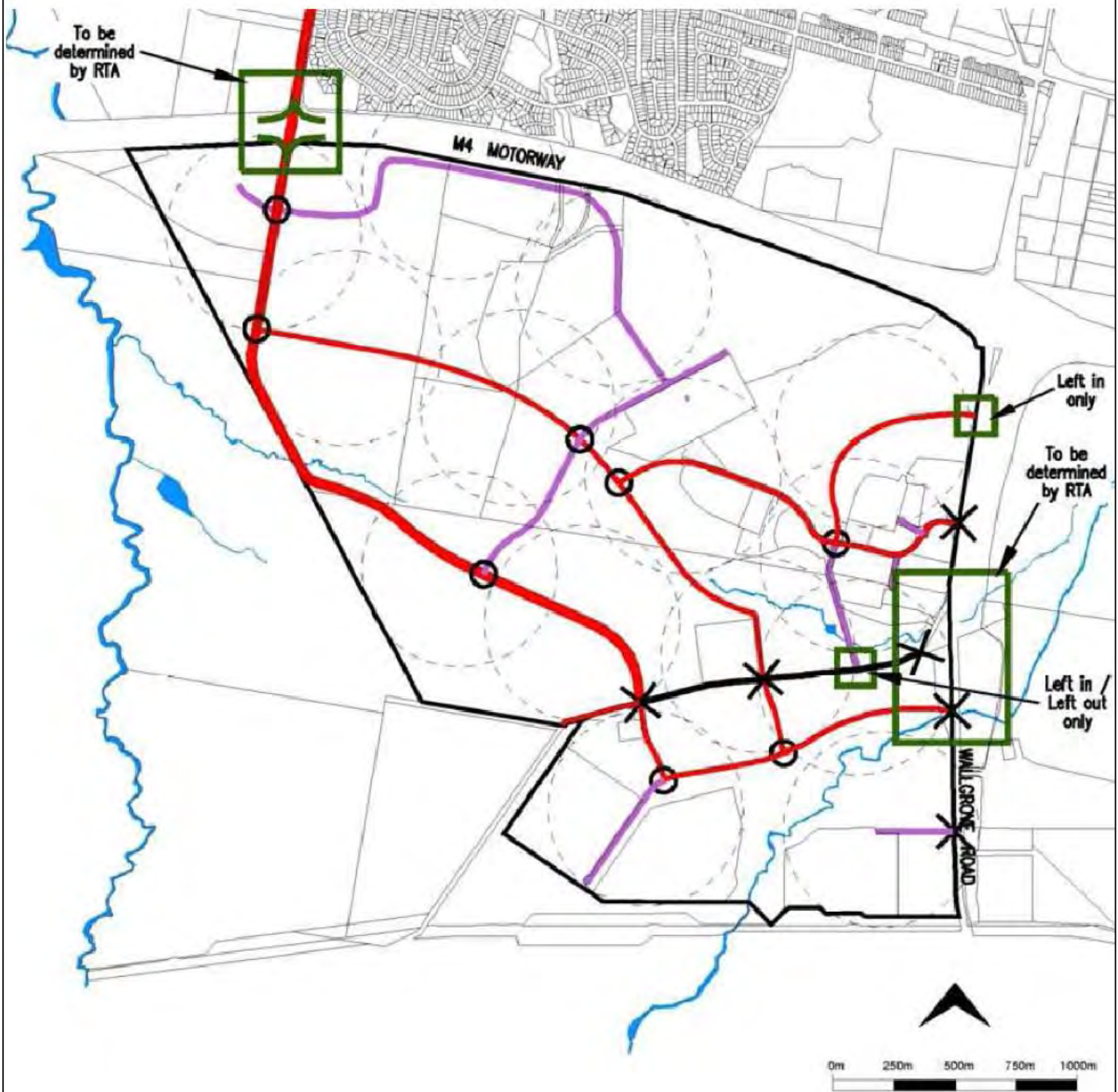
- * 4 connections along Wallgrove Road including the existing Old Wallgrove Road and Wonderland Drive connection
- * connection along Archibold Road to Great Western Highway and potential ramp connection to/from the M4.

The exact outcome in relation to the major road network connections is still subject to assessments and negotiations involving the RTA, Blacktown City Council and the Dept of Planning.

Old Wallgrove Road will become a 'Sub-Arterial Road' while a 'Main Collector Road' will extend westerly and then northerly linking to Archibold Road. There will be a number of 'Standard Collector Roads' including the existing Quarry Road (private ROW) route past the site which will connect to Old Wallgrove Road to the south-east and Archibold Road to the north-west.

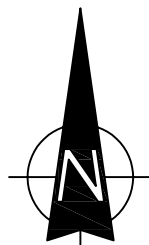
The extract from the Precinct Plan document reproduced overleaf specifies the following format for a Standard Collector Road:

Road Reserve	-	23.75 metres
Carriageway	-	15.5 metres (1 travel lane + parking lane in each direction)
Pedestrian	-	3.75 metres
Pedestrian/Cycle	-	4.5 metres



LEGEND

- Sub-arterial Road
- Local Road
- Main Collector Road
- Standard Collector Road
- Traffic Signals
- Roundabout



FUTURE ROAD NETWORK AND TRAFFIC CONTROLS

FIG 5

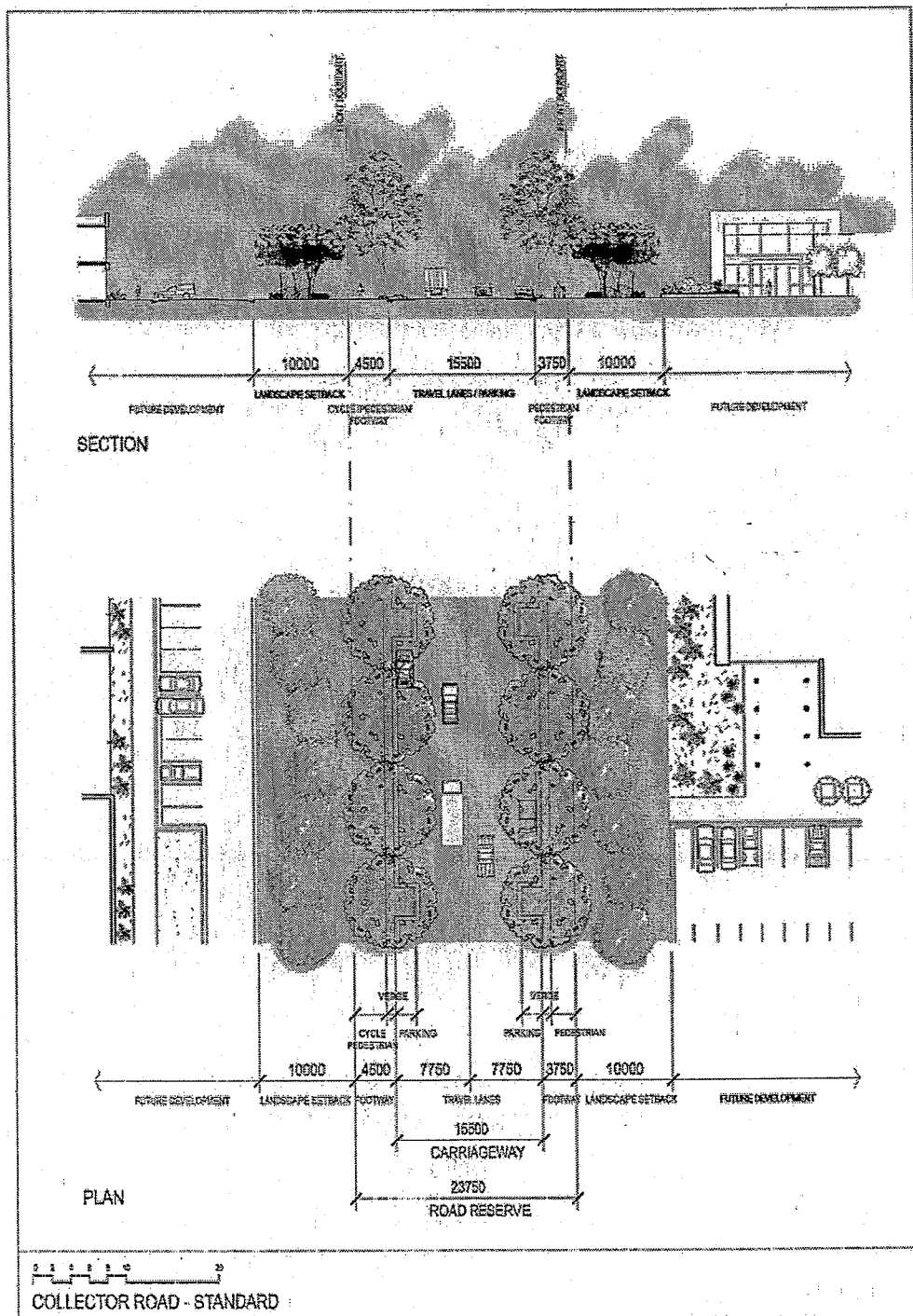


Figure 25 - Typical Standard Collector Road

Also relevant to the potential future road network outcome is the Erskine Park Link Road Network Concept and this proposal by the RTA is subject to a current Major Project Application (06/166) which is currently advertised for comment.

Details of this scheme are provided on the RTA diagram reproduced overleaf and includes:

1. An east-west link route connecting Mamre Road and Erskine Park Road to Old Wallgrove Road interchange and the M7 Motorway.
2. Eastern and western north-south link roads connecting the Erskine Park Link Road to the South West Precincts; and
3. A northern access road to Archbold Road connecting to Erskine Park Link Road to the M4 Motorway and Great Western Highway.

The principal differences between the proposed road networks identified in the two planning documents the extension southerly of Archibold Road and the introduction of the Erskine Park Link Road to meet Old Wallgrove Road (under the RTA plan).

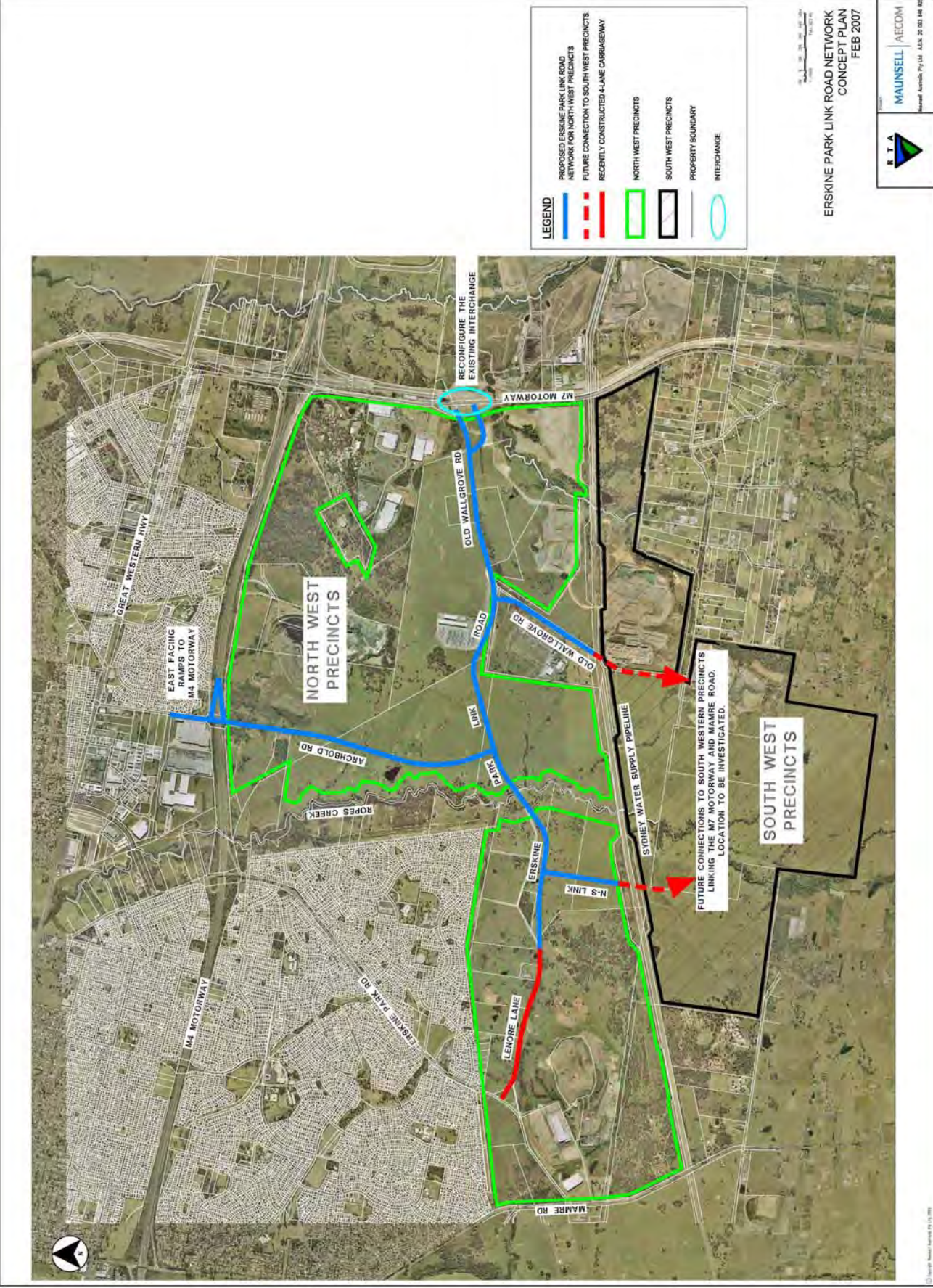
It is noted that the RTA have undertaken detailed investigations of both existing and predicted traffic conditions including traffic modelling of the proposed network. The results of these investigations will form part of the Environmental Assessment Report for the Concept Plan.

4.2 TRAFFIC CONTROLS

The proposed traffic controls on the road network under the Precinct Plan (Figure 5) will comprise:

- * traffic signal control at the connections to Wallgrove Road
- * traffic signal control at the intersection of the collector road past the site (Quarry Road) and Old Wallgrove Road

Figure 1.2: Western Sydney Employment Hub - Proposed Erskine Park Link Road Network (Option C)



- * roundabouts at the intersection of the collector road (past the site) and Archibold Road as well as at the connections with other collector and local access roads.

4.3 TRAFFIC CONDITIONS

An assessment¹ has been undertaken in relation to the traffic implications of the envisaged development in the Eastern Creek Precinct. That assessment established the projected traffic generation circumstances of development based on parameters provided by the authorities (Blacktown City Council and RTA).

The projections identified in this assessment are that there will be some 30,500 employees within the precinct and there will be some 8,700 vtp/h generated in the morning peak and some 10,000 vtp/h in the afternoon peak. An extract from that assessment is reproduced overleaf indicating the projected make-up of the various sites and their traffic generations.

The road network traffic modelling² undertaken for the precinct planning included numerous potential scenarios in relation to road links and connections with the arterial road system. The model output from those assessments (see Appendix B) indicates a potential total vehicle flow along the collector road fronting the site of some 1,000 vph (2 way) during the morning and afternoon peak periods (including the projected total site generation).

Hanson Construction Materials Pty Ltd lease the southern part of the Pioneer site and have submitted an application to the Department of Planning for Concept Approval to a development scheme which comprises:

- Concrete Batching Plant
- Concrete Recycling Plant
- Asphalt and Emulsion Plant
- Materials Storage Depot

^{1 & 2}

*Eastern Creek Precinct - Traffic Management Assessment
Sims Varley May 2005*

The Study Area

The Eastern Creek Employment Area, consisting of some 612.7ha of developable commercial/industrial land, is located to the east of Ropes Creek, south of the M4 Motorway and to the west of Wallgrove Road, as shown in **Figure 1**.

Figure 1: Eastern Creek Development Site



Source: 'Eastern Creek Strategic Landuse Studies', SKM Pty Ltd, December 2002

The commercial operations within the site are estimated to employ some 30,500, generate 8,700 vehicle trips in the AM peak period and 10,000 in the PM peak, as shown in **Table 2**.

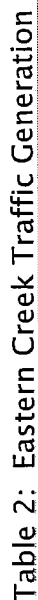


Table 2: Eastern Creek Traffic Generation

Lots/Parcel	Gravel Area	Developable Area	Employees per Developable Area	Total Number of Employees	Total Trains Assuming Reduction in Carload Spots per Day						Method	
					Range of Peak Hour Trains		Peak Hour		Peak Hour			
					Trains per Employee		Trains per Hour		Trains per Hour			
					AM Peak	PM Peak	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour		
					Hour Factor	Hour Factor	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound
					1.035	1.035	45%	45%	85%	85%	15%	15%
Lot 11												
Hartford Lane	58.0	16.6	63.0	1,046	299	344	45	254	292	52	927	
Hartford Lane - Lot 11		16.6	63.0	1,046	299	344	45	254	292	52	928	
Eastern Creek Business Pk		16.8	63.0	1,058	303	348	45	257	296	52	929	
Total	58.0	50.0		3,150	902	1,035	135	766	880	155		
Stage 1 & 2												
Australand	40.0	31.8	45.0	1,431	410	470	61	348	400	71	933	
Total	40.0	31.8		1,431	410	470	61	348	400	71		
Stage 3												
Sargents	26.4	22.4	48.8	1,093	313	359	47	266	305	54	973	
Fitzpatrick	94.0	74.0	48.8	3,611	1,034	1,186	155	878	1,008	178	920	
Pioneer	48.4	45.4	48.8	2,216	634	728	95	539	619	109	930	
Tesrol	32.0	32.0	48.8	1,562	447	513	67	380	436	77	974	
Jacfin	127.0	107.1	48.8	5,226	1,496	1,717	224	1,271	1,459	258	931	
Hartford Lane	119.7	30.0	48.8	1,464	419	481	63	356	409	72	936	
Austral Bricks	150.7	120.0	48.8	5,856	1,676	1,924	251	1,425	1,635	289	932	
Total	598.2	430.9		21,028	6,018	6,908	903	5,115	5,872	1,036		
Ropes Creek												
Fitzpatrick	134.8	50.0	48.8	2,440	698	802	105	594	681	120	934	
Jacfin	104.9	50.0	48.8	2,440	698	802	105	594	681	120	935	
Total	239.7	100.0		4,880	1,397	1,603	209	1,187	1,363	240		
TOTAL	935.9	612.7		30,489	8,726	10,016	1,309	7,417	8,513	1,502		

- | | | | | | | | | |
|--|-------|-------|--------|-------|--------|-------|-------|-------|
| TOTAL | 935.9 | 612.7 | 30,489 | 8,726 | 10,016 | 1,305 | 7,417 | 8,513 |
| <ol style="list-style-type: none"> 1. Gross and developable area provided by Blacktown Council 2. Employees per ha rates provided by Blacktown Council as adopted from SGS report (March 2005) 3. Peak hour trip factors adopted from RTA, Guide to Traffic Generating Developments - Table 3.4 4. Ratio of inbound to outbound trips based on standard ratios in RTA, Guide to Traffic Generating Developments 5. Peak hour trip factor with SEPP 59 car mode split reduction assumes all peak hour vehicle trips (i.e. journey to work + work trips) will reduce by 10% | | | | | | | | |

- Logistics Operation and Workshop
- Office and Laboratory
- Concrete Masonry Plant

The make up of the existing and projected vehicle movements for the Hanson development scheme during the morning and afternoon peak periods is as follows:

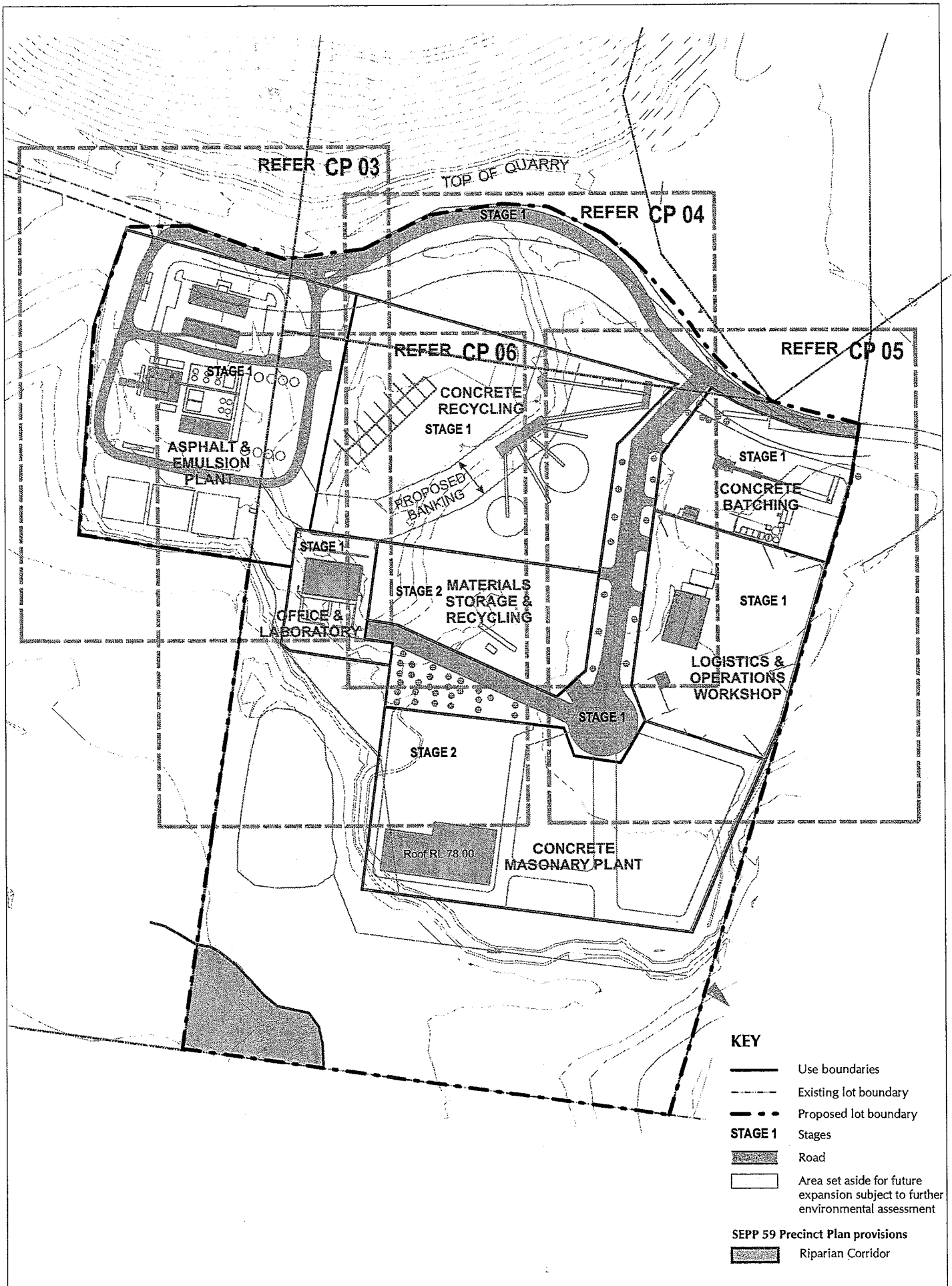
	Existing		Future	
	AM	PM	AM	PM
INBOUND				
Light	21	13	31	19
Medium	27	18	39	22
Heavy	12	2	16	6
Total	60	33	86	47
OUTBOUND				
Light	6	49	12	59
Medium	38	5	44	9
Heavy	10	6	14	10
Total	56	60	70	78
Two-Way Total	116	93	156	125

Details of the Hanson proposal are provided on the Concept Plan reproduced overleaf and it is noted that the projected traffic generation is substantially less than that assessed for that part of the Pioneer site under the Precinct Plan Assessment.

4.4 TRANSPORT SERVICES

Public transport targets for development of the precinct are identified in SEPP 59 to help reduce reliance on travel by private car. The Precinct Plan enunciates the objectives and principles for fostering and facilitating public transport services (ie bus routes connecting to railway stations and major centres). These measures include:

- * provision of bus stops within 400 metres of major employment generating landuses



Central Western Sydney Employment Lands: Wallgrove Rd, Eastern Creek

CONCEPT PLAN - SITE LAYOUT

prepared by urban design workshop
20510670Graphicart_02_04

A3 Is 1:2500 100 m

Issue 5-10-06

CP 02

- * bus priority measures where possible
- * provision of appropriate bus shelters, paving and lighting
- * integration within the local and regional transport systems
- * provision of bus schedule and route information at bus stops
- * provision of pedestrian routes and road crossings for bus stops
- * provision of bicycle routes
- * initiating Travel Demand Management Programs.

5. PROPOSED ROAD NETWORK, ACCESS AND INTERNAL CIRCULATION

5.1 ACCESS AND ROAD NETWORK

Vehicle access for the development will involve a number of elements as well as timing/ outcome scenarios, namely:

- * the access intersections on Old Wallgrove Road (ie Wallgrove Road and Quarry Road)
- * use of the existing roadway constructed within the Registered Right-of-Carriageway connecting between Old Wallgrove Road and the site boundary
- * use of the section of existing haulage road within the Contractual Right-of-Carriageway which runs along the southern side of the quarry wall
- * subject to approvals/timing replacement of the haulage road section with a new (parallel) section of roadway as proposed in the Hanson Application
- * ultimate access connection to the proposed new 'collector' roadway as prescribed in the Precinct Plan.

Access Intersections

The existing access intersections on Old Wallgrove Road comprise:

The traffic signal controlled Wallgrove Road intersection (details of which are provided in Appendix B) and the GIVE WAY sign controlled T Junction of Quarry Road. These intersections will be upgraded in the future to accord with the Precinct Plan/ Erskine Park Link Road Network schemes. However the timeframe for the undertaking of these works is not established.

The geometry and nature of these existing intersections is suitable for the types of vehicles associated with the proposed development (given the longstanding uses on the site (with heavy vehicles etc) and the other industrial uses in the area which access through these intersections which are subject to an RTA approved B Double route.

The existing roadway within the registered ROW connecting to Old Wallgrove Road is a heavy duty bitumen sealed 'industrial style' roadway. The roadway is some 8.0 metres wide, within a ROW some 10.5 metres wide, and is relatively straight and level (slight downgrade towards the east). The roadway, which has been well maintained and is in good condition, has a number of speed control devices (speed humps) which act to constrain undue vehicle speeds and has suitable sight distances available enabling safe overtaking of slow heavy vehicles if necessary.

It is apparent that this section of roadway will be appropriate and suitable for the uses engendered with the development scheme (ie heavy vehicles and public access). The roadway has been subject to constant use, including heavy vehicles, for many years without any apparent operational or safety problems.

The existing section of haulage road running within the Contractual ROW along the southern side of the quarry wall is unsealed and in a poor state of repair and it will be appropriate for a sealed industrial style pavement to be constructed for this section of access. The upgraded roadway should accord with the requirements of AS 2890.2 and be 7.0 metres wide with appropriate widenings on bends in accordance with Table 3.1 of that standard.

It is understood that a geotechnical investigation has been undertaken and recommendations made in relation to the stability of the quarry wall to support the roadway. Design of the roadway should include the provision of a guard rail along the quarry wall section (ie northern side) to accord with the criteria specified in the RTA Road Design Guide. A central 'barrier' line should be installed (to prevent overtaking) and a signposted speed limit of 40 kmph applied.

The Hanson development scheme proposes a new access roadway just to the south and parallel to the section of haulage road which is to be upgraded for site access. If this roadway outcome occurs then access for the site can be changed to be a simple extension of this roadway as depicted on the Hanson Site Layout Plan.

In the future circumstance with the ultimate construction of the 'collector' roadway the site access roadway can be truncated with access provided by a driveway located adjacent to the proposed workshop building.

5.2 INTERNAL CIRCULATION

The proposed internal road system is identified on the Site Layout Plan and will involve a system of 8 metre wide roadways providing access to the various elements of the development including:

- * weighbridge
- * workshop
- * Materials Processing Centre
- * waste drop-off zone
- * landfill
- * administration building
- * parking areas.

The roadways have been designed to rationalise and facilitate the 'flow' of materials with public access being limited to the Materials Processing Centre area. The main circulation roadways from the MPC will operate with a one-way traffic flow with two-way connectors to/from the drop-off zone and landfill etc. The proposed arrangement represents a very 'logical', efficient and relatively conflict free system for vehicle activity.

It will be appropriate for appropriate advisory (directional) signage as well as regulatory (one-way etc) signage to be provided including a 20 kmph speed restriction.

The design of the access roads, manoeuvring and carpark areas will be quite suitable and appropriate for the intended traffic movements and will accord with the requirements of:

- AS 2890.1 and 2
- Austroads
- Council's DCP's

6. TRAFFIC

6.1 TRAFFIC PROJECTIONS AND IMPLICATIONS

Planning for the road system to serve development within the precinct has comprised a number of separate studies³. The Sims Varley study projected traffic generation derived from employees per developable ha criteria to provide the basis to the design and operational performance of the future road system. This study estimated that there would be some 30,500 people employed in the precinct and these would generate some 8,700 vehicle movements in the morning peak hour and 10,000 in the afternoon peak hour.

The project site forms part of the Fitzpatrick and Pioneer sites referenced in the Sims Varley assessment and the assessed employee density was 48.8 persons per ha with each person generating 0.286 vtp/h in the morning and 0.329 vtp/h in the afternoon. The source of this data is referred to as the SGS Report of March 2005.

The operational area of the RRF and LF will be some 44 ha and putting aside any normal reduction in relation to 'developable land' (which is difficult to define in this case) the traffic generation projection using the Precinct Assessment criteria would be as follows:

44 ha @ 48.8	-	2,148 employees
Morning peak	-	614 vtp/h
Afternoon peak	-	707 vtp/h

³

*Eastern Creek Precinct – Traffic Management Assessment
Sims Varley May 2005*

*Western Sydney Employment Hub
Proposed Erskine Park with Road Network Working Paper № 2 Traffic Study
Maunsell / AECOM May 2007*

The Maunsell Study undertaken for the RTA adopted a projected traffic generation characteristic for the developed industrial lands of 15 vtpH per ha for the morning and afternoon peak periods. The adopted traffic generation for development of the site on this basis was relatively consistent with the Sims Varley estimate as follows:

44 ha @ 15 vtpH – 660 vtpH

The actual projected traffic generation of the proposed development during the morning and afternoon peak movements is however identified in Section 2 (Page 9) as follows:

Minimum	Maximum
84	96

The projected traffic generation outcome for the proposed development will therefore only be some 13 - 15% of that adopted in the Precinct Study and the RTA study. It is therefore apparent that the particular 'nature' of this proposed development is such that it will be a very low traffic generator in any context.

If the projected traffic movements of the proposed project are combined with that projected for the Hanson development the worst case (maximum) outcome for the morning and afternoon peak periods (ie total movement on the Quarry Road access) will be as follows:

	AM	PM
RRF and LF	96	96
Hanson	156	125
Total	252	211

The inbound and outbound trips will be relatively equal (directionally) and it is apparent that this demand will only be some 10% of that available on the 2 lane access road which has a capacity (two-way) of some 2,500 vtpH.

The road system and intersections will ultimately be upgraded to accommodate the traffic demands of development in the area in line with the criteria established in the Precinct and RTA documents. However there is a need to consider the traffic implications of development on the site in relation to the existing access intersection arrangements.

In this regard, the combined traffic demands of the proposed development and the proposed Hanson development have been considered in relation to the existing (surveyed) background traffic demands and intersection geometry/control arrangements. The projected traffic demands are overlaid on the existing intersection demands in the following:

		AM	PM
Wallgrove Road	Northbound	737	1169
	Right-turn	11	3
	Left-turn	157	61
	Southbound	906	640
	Right-turn	192	72
	Left-turn	114	-
Old Wallgrove Road	Eastbound	36	34
	Right-turn	72	103
	Left-turn	119	130
	Westbound	64	22
	Right-turn	11	9
	Left-turn	35	4
Old Wallgrove Road	Eastbound	104	148
	Left-turn	18	8
	Westbound	168	48
	Right-turn	112	87
Quarry Road	Right-turn	14	8
	Left-turn	104	118

The operational performance of the existing intersections under these projected demands has been assessed using SIDRA and the results of this analysis are provided in the following while criteria for interpreting the SIDRA results is reproduced overleaf.

	AM			PM		
	LOS	DS	AVD	LOS	DS	AVD
Wallgrove/Old Wallgrove	B	0.801	20.7	B	0.800	28.4
Old Wallgrove/Quarry	A	0.183	4.6	A	0.136	4.9

It is apparent that the performance of these intersections during the peak traffic periods will be quite satisfactory. Equally, because the traffic generation of the proposed developments on the site will only be a fraction of that assumed in the road planning studies it is quite apparent that the operation of the future (upgraded) intersections with development in the precinct will also be quite satisfactory.

Accordingly, both the existing and proposed road systems in the precinct will more than adequately cater for the traffic generated by the proposed development.

6.2 CONSTRUCTION TRAFFIC

During the estimated six month construction phase of the Project, there will be some 30 workers on-site (compared to 49 workers when operational). Variable volumes of construction traffic would be generated. Given that the external traffic generation associated with the construction works will be at a significantly lower order than that which would occur under the final operational circumstances a specific assessment of impact has not been undertaken for the construction phase. However due to the following factors, impacts from construction traffic are anticipated to be minimal and are not expected to affect the capacity of the surrounding road network:

- * relatively small volume of construction traffic to be generated, which will very largely be no greater than that associated with the former sites quarrying activities

Criteria for Interpreting Results of SIDRA Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good	Good
'B'	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
'C'	Satisfactory	Satisfactory but accident study required
'D'	Operating near capacity	Near capacity and accident study required
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
'F'	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

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

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**⁴ both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

*

⁴ the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs

- * heavy vehicles will generally be restricted to approved B-double routes, including along Wallgrove Road and Old Wallgrove Road
- * the impact would be short-term, as the construction period is only anticipated to last for six months; and
- * construction traffic will generally be restricted to day shift hours between 7.00am and 6.00pm).

The existing private access road more than adequately accommodated the former movements of vehicles accessing the site (including a significant percentage of heavy vehicles). It is apparent that the access movements during the construction phase can be suitably accommodated on this existing roadway particularly with the advantage provided by the traffic signal control at the Wallgrove Road intersections.

7. CONSULTATION PROCESS

Consultation has been undertaken with the Roads and Traffic Authority and Blacktown City Council in relation to the road network and traffic issues associated with the proposal. The issues which have arisen in this process are addressed specifically in the following:

Roads and Traffic Authority

1. The need to ensure that the site ties into the future road layout for the Eastern Creek Employment Lands.

Response: The site development will suitably enable that future 'tie in' and nothing which is proposed will obstruct or make difficult the future road network.

2. The applicable developer contributions towards external intersection works to be arranged and agreed with the RTA and DOP.

Response: This will be undertaken, however it is apparent, due to the nature of the proposed development and its low generation characteristics, that the existing road system will be quite adequate to accommodate the generated traffic (including that of the Hanson development).

Blacktown City Council

1. Width of the right-of-way and ability of the road surface to take the predicted traffic generation.

Response: The existing 8 metre wide roadway and its construction is more than adequate to accommodate the projected volume and nature of traffic movements.

2. Integrity of the road near the edge of the Quarry lip.

Response: This will be dealt with separately.

3. Need to assess the traffic impact.

Response: Assessment provided in the Traffic Impact Assessment

8. AMELIORATION ASSESSMENT

Assessment in relation to the potential traffic implications of the proposed redevelopment has concluded that the internal, access and external road systems will be suitable and adequate for the traffic needs and circumstances related to the proposed development. This outcome is largely due to:

- * the existing provisions for the historical uses on the site involving heavy vehicle activity
- * the traffic generation outcome with the proposed development being of a relatively low order and significantly less than that foreseen in the studies undertaken for the planning of the road system to serve development in the area.

Nonetheless, there are a number of amelioration measures relative to each element of access and circulation which will be necessary to ensure an appropriate and safe traffic outcome as follows:

Access Road (Contractual ROW):

Existing Circumstance

In lieu of the access indicated on the 'Site Layout' plan provide a roadway along and within the site boundary connecting to the access road within the Registered ROW.

- * construct a sealed industrial standard road pavement generally 7.0 metres wide along the existing section of 'haulage road' (AS 2890.2 for design and Council standards for construction)

- * install guard rail along the northern side of the road along the edge of the quarry wall (RTA standard for design)
- * install 'barrier' centreline along the roadway with 40 kmph speed restriction and appropriate lighting.

Future Circumstance

With the advent of the Precinct Plan road system the 'Standard Collector Road' will be accommodated through the south-western corner of the site (in accordance with the detailed identified in the Precinct Plan). The site access will then be modified to provide an access connection with a driveway located adjacent to the Workshop building.

Circulation Roadways:

- * construct a sealed industrial standard road pavement (Council design standard)
- * provide appropriate directional and regulatory signposting
- * provide appropriate lighting
- * provide appropriate fencing and barriers to avoid any safety issues in relation to the quarry wall (vehicle and pedestrian)
- * provide paved parking areas and linemarked parking areas (AS 2890.1 design standard)
- * ensure that design provides for the access and manoeuvring of all vehicles requiring to access the site (AS 2890.2 design standard).

Appendix A

VEHICLE CLASSIFICATIONS AND TYPICAL TRAFFIC PROFILES

LENGTH (indicative)	CLASS	VEHICLE TYPE	AXLES AND AXLE GROUPS		AUSTROADS CLASSIFICATION
			AXLES	GROUPS	PARAMETERS
SHORT Up to 6.5m		LIGHT VEHICLES			
	1	SHORT VEHICLE SEDAN WAGON, 4WD, UTILITY, LIGHT VAN, BICYCLE, MOTORCYCLE etc 	2	1 or 2	$d(1) \leq 3.2m$ and Axles = 2
MEDIUM 5.5m to 14.5m	2	SHORT VEHICLE TOWING eg TRAILER, CARAVAN, BOAT etc 	3, 4, or 5	3	$d(1) > 2.1m$, $d(1) \leq 3.2m$ $d(2) > 2.1m$ and Axles = 3, 4, or 5 Groups = 3
		HEAVY VEHICLES			
LONG 11.5m to 19.0m	3	TWO AXLE TRUCK OR BUS 	2	2	$d(1) > 3.2m$ and Axles = 2
	4	THREE AXLE TRUCK OR BUS 	3	2	Axles = 3 and Groups = 2
	5	FOUR AXLE TRUCK 	>3	2	Axles > 3 and Groups = 2
	6	THREE AXLE ARTICULATED VEHICLE RIGID VEHICLE AND TRAILER, OR 3 AXLE ARTICULATED VEHICLE 	3	3	$d(1) > 3.2m$, Axles = 3 and Groups = 3
MEDIUM COMBINATION VEHICLE 17.5m to 36.5m	7	FOUR AXLE ARTICULATED VEHICLE RIGID VEHICLE AND TRAILER, OR 4 AXLE ARTICULATED VEHICLE 	4	>2	$d(2) < 2.1m$ or $d(1) < 2.1m$ or $d(1) > 3.2m$ Axles = 4 and Groups > 2
	8	FIVE AXLE ARTICULATED VEHICLE RIGID VEHICLE AND TRAILER, OR 5 AXLE ARTICULATED VEHICLE 	5	>2	$d(2) < 2.1m$ or $d(1) < 2.1m$ or $d(1) > 3.2m$ Axles = 5 and Groups > 2
	9	SIX AXLE ARTICULATED VEHICLE RIGID VEHICLE AND TRAILER, OR 6 (OR MORE) AXLE ARTICULATED VEHICLE 	6 >6	>2 3	Axles = 6 and Groups > 2, or Axles > 6 and Groups = 3
	10	B-DOUBLE B DOUBLE OR HEAVY TRUCK AND TRAILER 	>6	4	Groups = 4 and Axles > 6
LONG COMBINATION VEHICLE Over 33.0m	11	DOUBLE ROAD TRAIN DOUBLE ROAD TRAIN, OR HEAVY TRUCK WITH TWO TRAILERS 	>6	'5 or 6	Groups = 5 or 6 and Axles > 6
	12	TRIPLE ROAD TRAIN TRIPLE ROAD TRAIN, OR HEAVY TRUCK AND THREE TRAILERS 	>6	>6	Groups > 6 and Axles > 6
	13	ALL OTHER VEHICLES	-	-	-

DEFINITIONS: Group - axle group where the axles are less than 2.1m apart

Groups - number of axle groups

Axles - number of axles on the vehicle (maximum axle spacing of 10m)

d(1) - distance between first and second axle of vehicle

d(2) - distance between second and third axle of vehicle

Count Number

629

Ref : TTP

Street

HANSON PRIVATE ROAD, EASTERN CREEK : From ARCHBOLD ROAD to OLD WALGROVE ROAD : EAST BOUND

Location

Week 1 about 30-40 metres east of Hansons Cement Plant, avoid impact of speed hump on speed

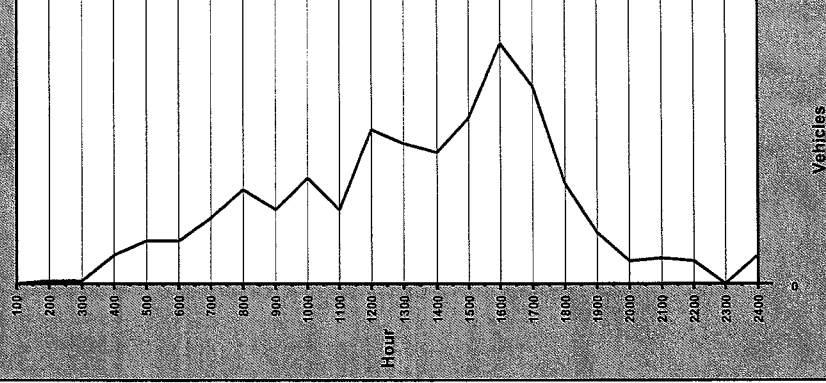
Carriageway

MON

11-SEP-06

Start Date
Start Time
Duration
Interval11-SEP-06
1200
14 DAYS
1 HOURWeekly 50th Percentile Speed
Weekly 85th Percentile Speed
Five Day ADT
Seven Day ADT57
69
686
531

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2am - 3am	0	0	0	0	1	0	0	0	0	0	0	0	0	0	10
3am - 4am	0	2	0	0	0	0	0	0	1	7	0	0	0	0	15
4am - 5am	1	0	0	0	0	0	0	0	0	14	0	0	0	0	15
5am - 6am	0	0	0	0	1	0	0	1	3	10	0	0	0	0	23
6am - 7am	1	2	0	1	3	1	1	0	1	12	1	0	0	0	33
7am - 8am	1	3	0	6	14	4	0	1	0	4	0	0	0	0	26
8am - 9am	1	5	0	3	8	1	0	0	0	8	0	0	0	0	37
9am - 10am	3	6	0	4	15	5	0	0	0	4	0	0	0	0	26
10am - 11am	0	1	0	6	9	2	0	0	0	8	0	0	0	0	54
11am - Midday	4	18	0	5	12	6	0	0	1	8	0	0	0	0	49
Midday - 1pm	3	11	0	8	12	3	0	0	1	11	0	0	0	0	46
1pm - 2pm	2	16	0	6	8	2	1	0	0	10	1	0	0	0	58
2pm - 3pm	2	38	0	4	7	1	0	0	1	4	1	0	0	0	84
3pm - 4pm	0	71	1	4	3	1	0	0	0	4	0	0	0	0	69
4pm - 5pm	2	45	1	0	5	1	0	0	1	14	0	0	0	0	35
5pm - 6pm	0	26	0	0	1	0	0	0	0	8	0	0	0	0	18
6pm - 7pm	0	9	0	0	0	0	0	0	1	8	0	0	0	0	8
7pm - 8pm	0	5	0	0	0	0	0	0	0	3	0	0	0	0	9
8pm - 9pm	0	5	0	0	0	0	0	0	0	4	0	0	0	0	8
9pm - 10pm	0	8	0	0	0	0	0	0	0	0	0	0	0	0	10
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
11pm - Midnight	0	5	1	0	0	0	0	0	0	4	0	0	0	0	635
Total	20	277	3	47	99	27	2	2	10	145	3	0	0	0	
% of Total	3	44		7	16	4		2	2	23					



Count Number 629

Ref : TTP

Street

HANSON PRIVATE ROAD, EASTERN CREEK : From OLD WALGROVE ROAD to ARCHBOLD ROAD : WEST BOUND

Location

Week 1 about 30-40 metres east of Hansons Cement Plant, avoid impact of speed hump on speed

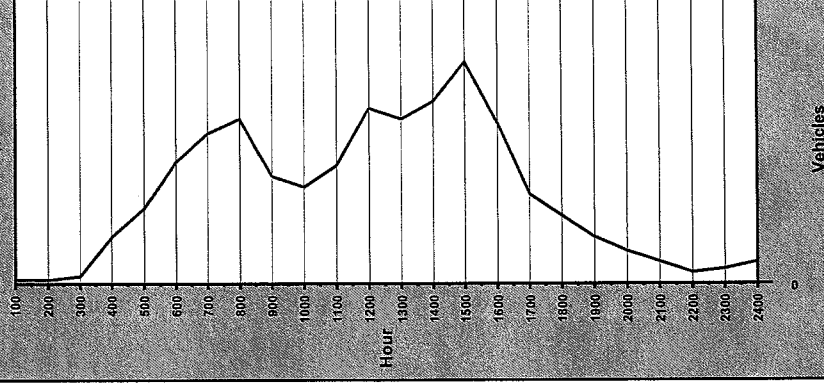
Carriageway

MON

11-SEP-06

Start Date
Start Time
Duration
Interval11-SEP-06
1200
14 DAYS
1 HOURWeekly 50th Percentile Speed 51
Weekly 85th Percentile Speed 62
Five Day ADT 692
Seven Day ADT 534

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2am - 3am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
3am - 4am	1	12	0	0	0	0	0	0	0	0	0	0	0	0	13
4am - 5am	0	21	0	0	0	0	0	0	0	0	0	0	0	0	21
5am - 6am	1	29	0	0	2	0	0	0	0	1	0	0	0	0	34
6am - 7am	0	18	0	5	8	3	0	1	0	7	0	0	0	0	42
7am - 8am	0	21	0	8	5	2	0	0	0	10	0	0	0	0	46
8am - 9am	0	9	0	3	9	2	0	0	2	5	0	0	0	0	30
9am - 10am	0	5	0	2	9	4	0	0	0	7	0	0	0	0	27
10am - 11am	4	1	0	5	14	3	0	1	1	4	0	0	0	0	33
11am - Midday	0	11	0	10	11	6	0	0	0	11	0	0	0	0	49
Midday - 1pm	2	16	0	1	15	2	0	1	0	9	0	0	0	0	46
1pm - 2pm	4	13	0	5	12	3	0	0	0	14	0	0	0	0	51
2pm - 3pm	5	22	1	5	6	1	0	0	0	21	1	0	0	0	62
3pm - 4pm	2	29	0	0	5	1	0	0	1	7	0	0	0	0	45
4pm - 5pm	2	11	0	1	9	0	0	0	0	2	0	0	0	0	25
5pm - 6pm	2	4	0	0	3	1	0	0	0	9	0	0	0	0	19
6pm - 7pm	3	3	0	0	0	0	0	0	0	7	0	0	0	0	13
7pm - 8pm	0	3	0	0	0	0	0	0	0	6	0	0	0	0	9
8pm - 9pm	1	0	0	0	1	0	0	0	0	4	0	0	0	0	6
9pm - 10pm	1	1	0	0	0	0	0	0	0	1	0	0	0	0	3
10pm - 11pm	0	1	1	1	0	0	0	0	0	1	0	0	0	0	4
11pm - Midnight	2	1	0	0	0	0	0	0	0	3	0	0	0	0	6
Total	30	235	2	46	109	28	0	3	4	129	2	0	0	0	588
% of Total	5	40		8	19	5		1	1	22					



Count Number629Ref : TTP

StreetHANSON PRIVATE ROAD, EASTERN CREEK : From ARCHBOLD ROAD to OLD WALGROVE ROAD : EAST BOUND

LocationWeek 1 about 30-40 metres east of Hansons Cement Plant, avoid impact of speed hump on speed

Carriageway

Weekly 50th Percentile Speed57

Weekly 85th Percentile Speed69

Five Day ADT686

Seven Day ADT531

Start Date11-SEP-06

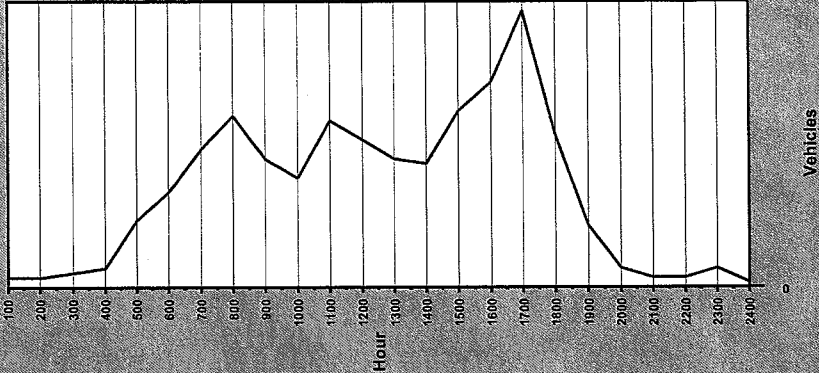
Start Time1200

Duration14 DAYS

Interval1 HOUR

THU14-SEP-06

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
1am - 2am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2am - 3am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
3am - 4am	0	1	0	0	0	0	0	0	0	3	0	0	0	0	4
4am - 5am	0	2	0	0	0	0	0	0	0	12	0	0	0	0	14
5am - 6am	2	1	0	0	4	1	0	0	3	9	0	0	0	0	20
6am - 7am	1	5	0	2	4	0	0	0	2	15	0	0	0	0	29
7am - 8am	1	5	0	9	9	3	0	0	4	5	0	0	0	0	36
8am - 9am	0	5	0	7	3	3	0	0	0	9	0	0	0	0	27
9am - 10am	1	6	0	0	7	3	0	0	1	5	0	0	0	0	23
10am - 11am	0	8	1	7	8	1	0	0	2	8	0	0	0	0	35
11am - Midday	0	9	0	4	5	1	0	0	0	11	1	0	0	0	31
Midday - 1pm	0	5	0	3	9	0	0	0	1	9	0	0	0	0	27
1pm - 2pm	1	9	0	1	10	0	0	0	0	5	0	0	0	0	26
2pm - 3pm	1	19	0	2	7	1	0	0	1	6	0	0	0	0	37
3pm - 4pm	1	28	0	1	11	1	0	0	0	1	0	0	0	0	43
4pm - 5pm	1	48	0	1	2	0	0	0	0	6	0	0	0	0	58
5pm - 6pm	1	23	0	2	1	0	0	0	0	5	0	0	0	0	32
6pm - 7pm	0	7	0	0	0	0	0	0	0	6	0	0	0	0	13
7pm - 8pm	0	2	0	0	0	0	0	0	0	2	0	0	0	0	4
8pm - 9pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
9pm - 10pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
10pm - 11pm	0	1	0	0	0	0	0	0	0	3	0	0	0	0	4
11pm - Midnight	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	10	195	1	39	81	14	0	0	14	120	1	0	0	0	475
% of Total	2	41	8	17	3				3	25					



Count Number 629

Ref : TTP

Street HANSON PRIVATE ROAD, EASTERN CREEK : From OLD WALGROVE ROAD to ARCHBOLD ROAD : WEST BOUND

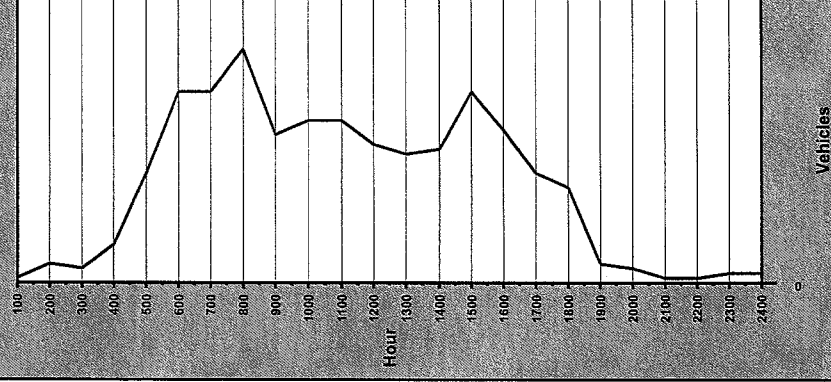
Location Week 1 about 30-40 metres east of Hansons Cement Plant, avoid impact of speed hump on speed Carriageway

THU

14-SEP-06

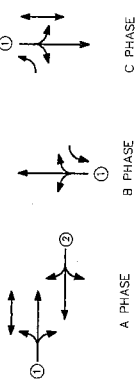
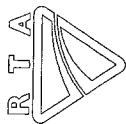
Start Date
Start Time
Duration
Interval11-SEP-06
1200
14 DAYS
1 HOURWeekly 50th Percentile Speed 51
Weekly 85th Percentile Speed 62
Five Day ADT 692
Seven Day ADT 534

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
1am - 2am	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4
2am - 3am	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3
3am - 4am	0	6	0	0	0	0	0	0	0	2	0	0	0	0	8
4am - 5am	0	23	0	0	0	0	0	0	0	0	0	0	0	0	23
5am - 6am	0	33	0	0	2	0	0	0	1	4	0	0	0	0	40
6am - 7am	1	23	0	9	2	1	0	0	1	3	0	0	0	0	40
7am - 8am	1	24	0	10	8	2	0	0	2	1	1	0	0	0	49
8am - 9am	1	8	0	2	7	1	0	0	2	10	0	0	0	0	31
9am - 10am	0	12	1	3	6	3	0	0	1	8	0	0	0	0	34
10am - 11am	0	7	0	8	7	1	0	0	2	9	0	0	0	0	34
11am - Midday	0	9	0	2	5	1	0	0	0	12	0	0	0	0	29
Midday - 1pm	0	6	0	1	13	0	0	0	1	6	0	0	0	0	27
1pm - 2pm	1	8	0	2	9	0	0	0	0	8	0	0	0	0	28
2pm - 3pm	1	8	0	2	11	1	0	0	2	15	0	0	0	0	40
3pm - 4pm	0	12	1	1	6	1	0	0	2	9	0	0	0	0	32
4pm - 5pm	0	8	0	0	3	1	0	0	4	7	0	0	0	0	23
5pm - 6pm	0	3	0	1	1	1	0	0	1	13	0	0	0	0	20
6pm - 7pm	0	1	0	0	0	0	0	0	0	3	0	0	0	0	4
7pm - 8pm	0	1	0	0	1	0	0	0	0	1	0	0	0	0	3
8pm - 9pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9pm - 10pm	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
10pm - 11pm	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
11pm - Midnight	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Total	5	195	2	42	83	13	0	0	19	119	1	0	0	0	479
% of Total	1	41		9	17	3			4	25					



Appendix B

INTERSECTION PLAN



SPECIAL SIGNAL GROUP DISPLAY SEQUENCE CHART

SIGNAL GROUP	TABLE TYPE	REMARKS
B LT	9	
C LT	76	TIMED R.A. PROTECTION FOR 'A' PEDESTRIAN PUSH BUTTON ON POST 3 EXTENDS R.A. SUBJECT TO TIME
C(TRA)	83	TIMED R.A. PROTECTION FOR 'C' PEDESTRIAN PUSH BUTTON ON POST 5 EXTENDS R.A. SUBJECT TO TIME

MOVEMENTS

DETECTOR SPECIFICATION SCHEDULE

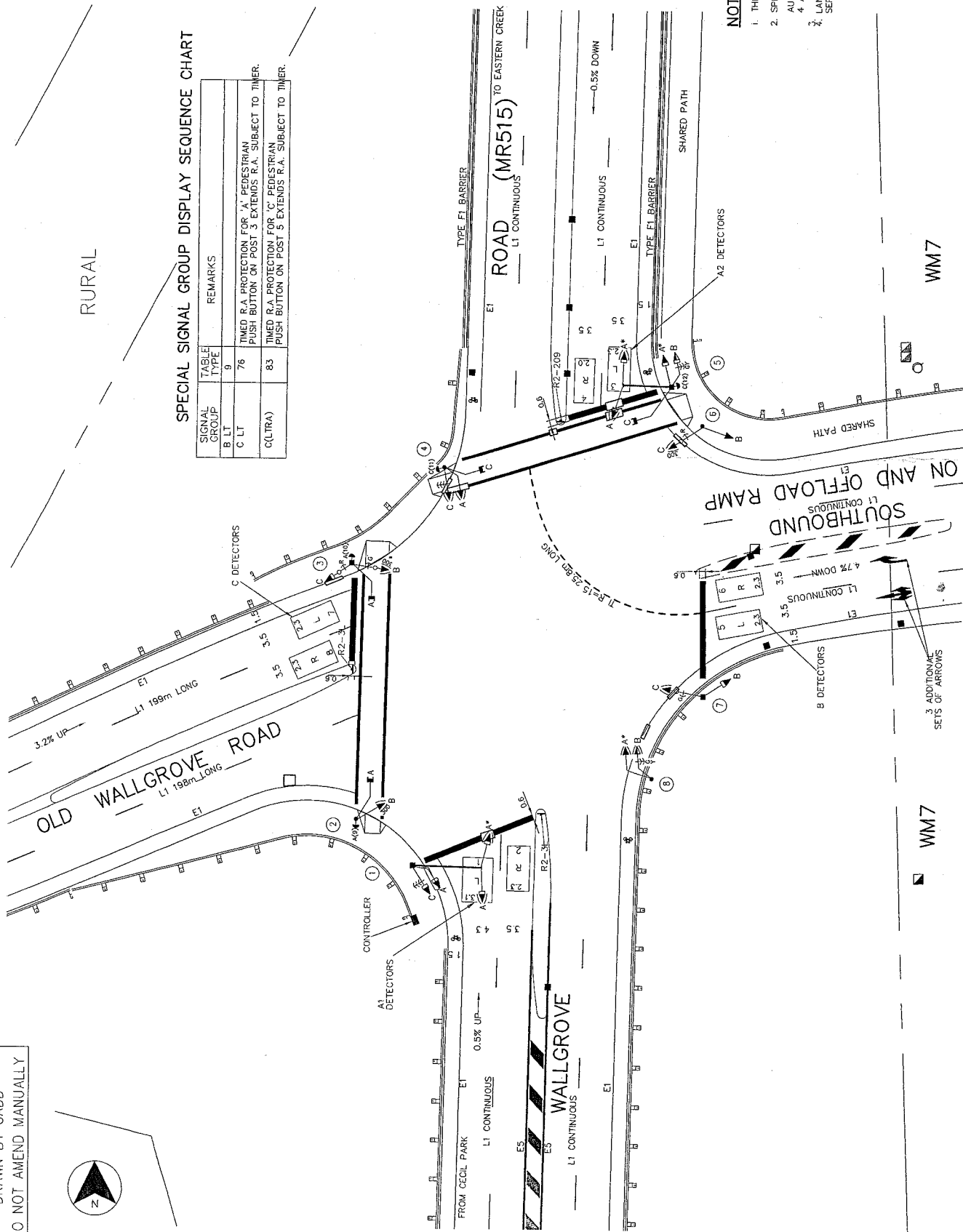
DETECTOR	SPECIFICATIONS				
	FN	AL	AL	AL	AL
A1	S6/PS	A	A		
	DS	—			
A2	FN	AL	A(E2)		
	S6/PS	A	A		
B	DS	—			
	FN	BL	B(E1)		
C	S6/PS	B	B		
	DS	—			
A	FN	CL	C(E1)		
	S6/PS	C	C		
P.B.	DS	—			
	FN	APB	BL		
C	S6/PS	A(WLK)	A-A(WLK)		
	DS	—	B C		
P.B.	FN	CPB	AL		
	S6/PS	C(WLK)	C(WLK)		
C	DS	—	A B		

POSTS

POST TYPE	LENGTH	REMARKS
1	9	EX. 7m OUTREACH
2	2	EXISTING
3	6	EXISTING
4	2	EXISTING
5	9	EX. 5m OUTREACH
6	2	EXISTING
7	6	EXISTING
8	2	EXISTING

NOTES

1. THIS SITE IS SCATS LINKED.
2. SPECIAL STOP SIGN R1-4 IS PLACED ON POSTS 3 AND 7.
AUDIO TACTILE PUSH BUTTONS ARE PROVIDED ON POSTS 2, 3,
4 AND 5.
3. LANTERNS DENOTED BY AN ASTERISK (*) ARE CONNECTED TO A
SEPARATE SIGNAL GROUP.

[illegible]

Appendix C

TRAFFIC SURVEY RESULTS



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client

T.T.P.A.

Job No/Name

:2229 EASTERN CREEK Wallgrove Rd

Day/Date

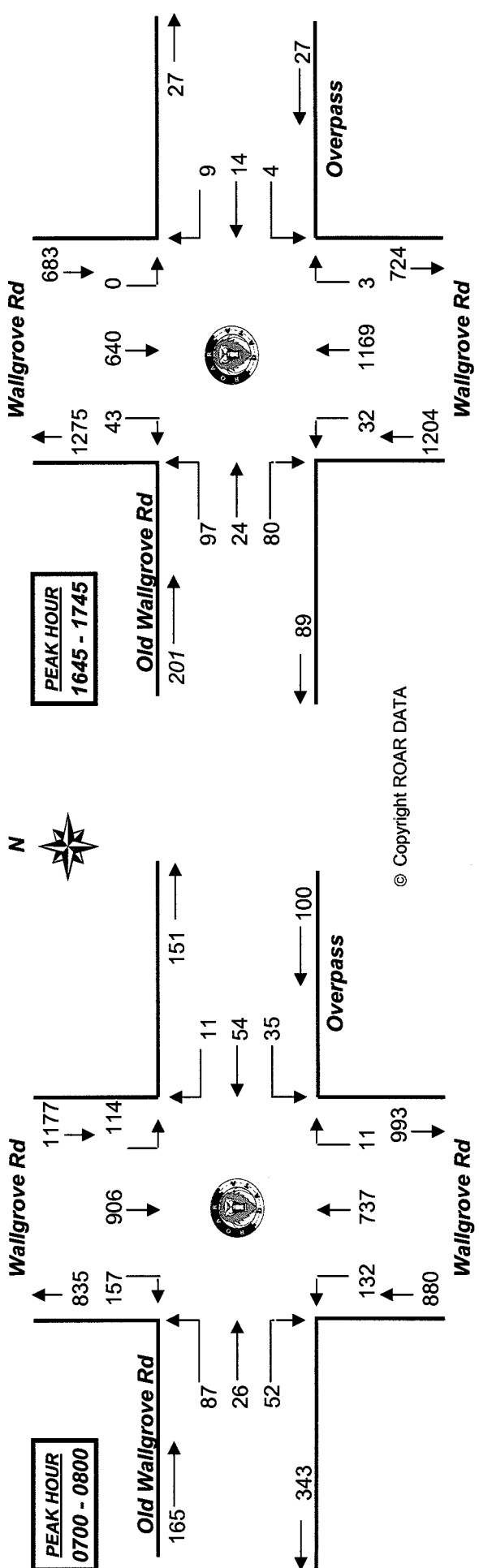
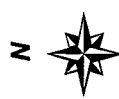
:Wednesday 16th April 08

All Vehicles	NORTH				WEST				SOUTH				EAST			
	Wallgrove Rd				Old Wallgrove Rd				Wallgrove Rd				Overpass			
	L	I	R	TOT	L	I	R	TOT	L	I	R	TOT	L	I	R	TOT
0700 - 0715	32	232	52	316	9	5	10	24	30	140	2	1	9	14	1	536
0715 - 0730	32	240	45	317	21	5	15	41	28	181	1	8	10	10	2	588
0730 - 0745	21	220	25	266	30	6	16	52	38	202	3	7	18	6	6	592
0745 - 0800	29	214	35	278	27	10	11	48	36	214	5	11	12	2	2	606
0800 - 0815					24	4	15	43	24	182	1					250
0815 - 0830	28	214	21	263	26	2	11	39	39	222	4	10	12	9	9	598
0830 - 0845	27	152	20	209	26	2	13	41	18	235	6	7	16	12	534	
0845 - 0900	41	188	52	381	20	4	10	34	33	208	4	6	20	4	4	590
Period End	210	1460	250	1920	183	38	101	322	246	1584	26	58	102	36	4294	

All Vehicles	NORTH				WEST				SOUTH				EAST			
	Wallgrove Rd				Old Wallgrove Rd				Wallgrove Rd				Overpass			
	L	I	R	TOT	L	I	R	TOT	L	I	R	TOT	L	I	R	TOT
0700 - 1615		157	9	166	34	15	25	74	10	244	2	6	3	3	3	508
1615 - 1630		181	10	191	40	13	14	67	6	231	1	1	2	3	3	502
1630 - 1645		179	10	189	43	14	20	77	12	273	1	1	4	1	4	558
1645 - 1700		174	11	185	22	5	26	53	10	285	0	2	6	6	6	547
1700 - 1715					32	6	23	61	6	274	1					342
1715 - 1730		264	10	274	18	3	16	37	6	325	1	1	3	1	3	648
1730 - 1745		202	22	224	25	10	15	50	10	285	1	1	5	2	2	578
1745 - 1800		180	12	192	21	11	14	46	8	242	1	2	3	1	4	495
Period End	0	1337	84	1421	235	77	153	465	68	2159	8	14	26	17	4178	

Peak Time	NORTH				WEST				SOUTH				EAST				
	Wallgrove Rd				Old Wallgrove Rd				Wallgrove Rd				Overpass				
	L	I	R	TOT	L	I	R	TOT	L	I	R	TOT	L	I	R	TOT	
0700 - 0800	114	906	157	2322	87	26	52	132	737	11	35	54	11	35	54	11	2322
0715 - 0815	82	674	105	2036	102	25	57	126	779	10	26	40	10	26	40	10	2036
0730 - 0830	78	648	81	2046	107	22	53	137	820	13	28	42	17	28	42	17	2046
0745 - 0845	84	580	76	1988	103	18	50	117	853	16	28	40	23	28	40	23	1988
0800 - 0900	96	554	93	1972	96	12	49	114	847	15	23	48	25	23	48	25	1972
												</					

PEAK HOUR	114	906	157	87	26	52	132	737	11	35	54	11	2322
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Appendix D

EXTRACT FROM EASTERN CREEK PRECINCT TRAFFIC ASSESSMENT



Option 3A – Access south of Old Wallgrove Road with Recommended Regional Infrastructure

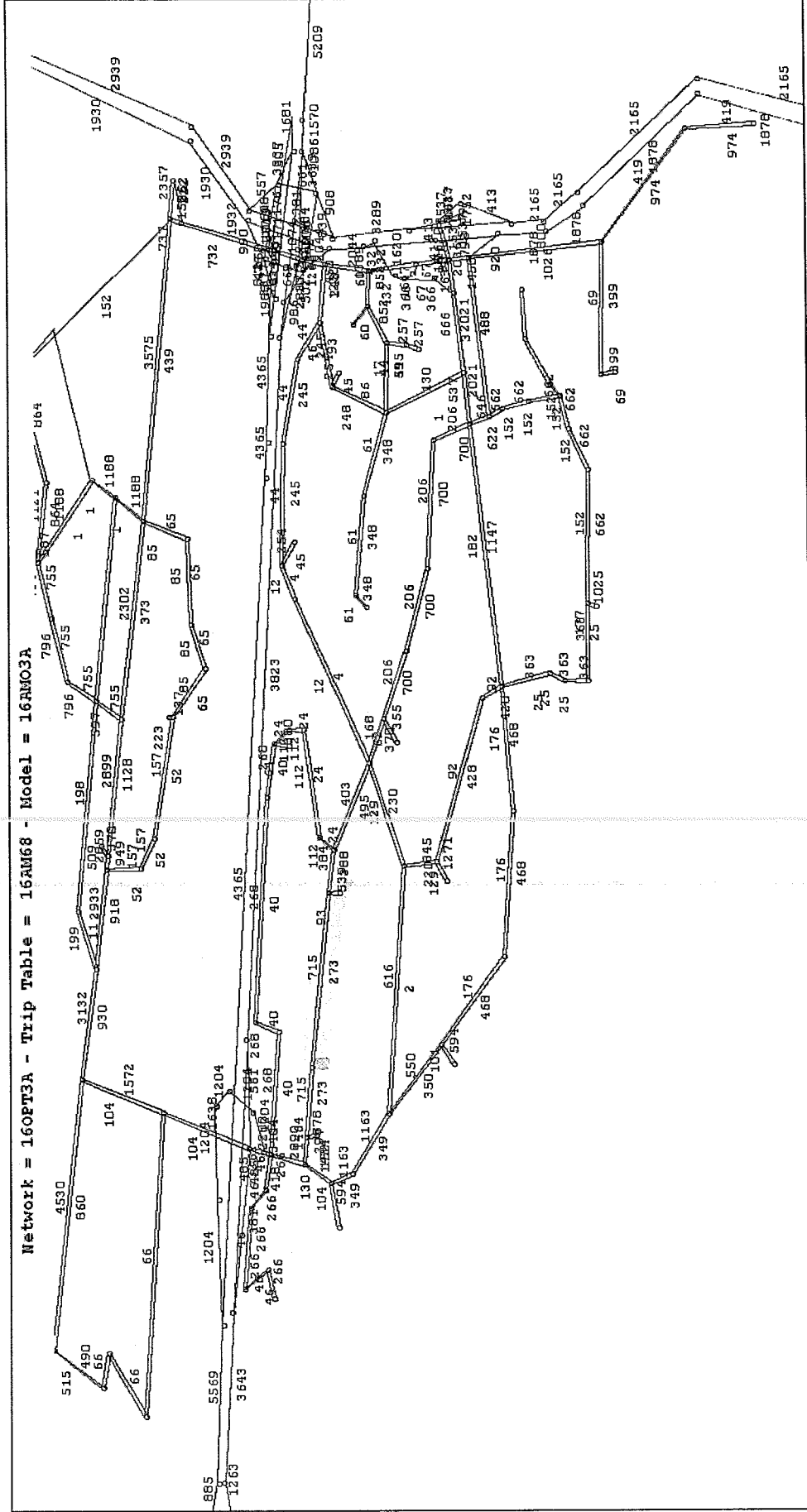


Option 3 A

- Austral Bricks access connection to Old Wallgrove Road
- Eastern Creek Business Park connection to Old Wallgrove Road
- No Connection through Sydney Water
- Introduction of access onto Wallgrove Road at the site of the programmed M7 northbound carriageway offload ramps, some 200 metres south of Old Wallgrove Road
- Widening of Archbold Road to 4 lanes
- Introduction of Archbold Road onload and offload ramps at the M4 Motorway
- Introduction of onload ramp to M7 northbound carriageway from Old Wallgrove Road and Wallgrove Road



Figure E26: Option 3A - AM Peak Plot



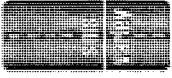
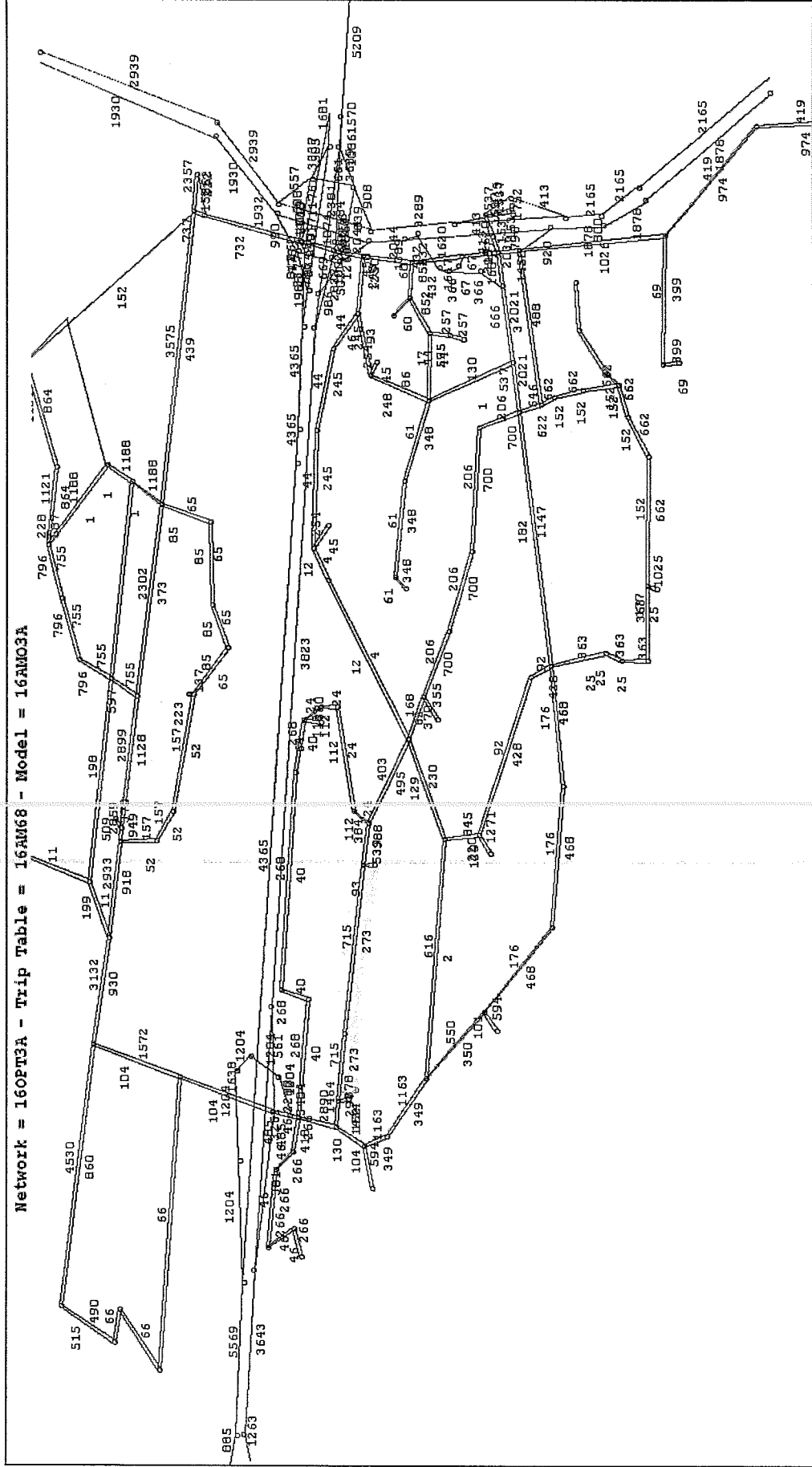


Figure E28: Option 3A - PM Peak Plot



Appendix E

SIDRA RESULTS



Movement Summary

Old Wallgrove and Wallgrove

Future AM Peak

Signalised - Fixed time

Cycle Time = 90 seconds

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Wallgrove										
1	L	165	0.0	0.414	16.4	LOS B	80	0.51	0.81	41.3
2	T	776	0.0	0.414	10.2	LOS A	86	0.56	0.51	46.9
3	R	12	0.0	0.413	20.0	LOS B	86	0.61	0.80	38.7
Approach		953	0.0	0.414	11.4	LOS A	86	0.55	0.56	45.7
New E leg										
4	L	37	0.0	0.456	55.0	LOS D	26	1.00	0.75	23.8
5	T	67	0.0	0.456	46.8	LOS D	27	1.00	0.75	26.2
6	R	12	0.0	0.456	55.0	LOS D	27	1.00	0.75	23.8
Approach		116	0.0	0.456	50.3	LOS D	27	1.00	0.75	25.2
New N leg										
7	L	120	0.0	0.799	20.4	LOS B	222	0.79	0.88	38.4
8	T	954	0.0	0.801	13.7	LOS A	222	0.80	0.75	43.6
9	R	202	0.0	0.800	41.2	LOS C	98	0.92	0.99	28.1
Approach		1276	0.0	0.801	18.7	LOS B	222	0.82	0.80	39.6
Old Wallgrove										
10	L	125	0.0	0.757	56.4	LOS D	53	1.00	0.88	23.5
11	T	38	0.0	0.680	46.6	LOS D	48	1.00	0.84	26.3
12	R	76	0.0	0.680	54.8	LOS D	48	1.00	0.84	23.9
Approach		239	0.0	0.757	54.3	LOS D	53	1.00	0.86	24.0
All Vehicles		2584	0.0	0.801	20.7	LOS B	222	0.74	0.72	38.2

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Movement Summary

Old Wallgrove and Wallgrove

Future PM Peak

Signalised - Fixed time

Cycle Time = 80 seconds

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Wallgrove										
1	L	64	0.0	0.790	37.6	LOS C	168	0.93	0.96	29.5
2	T	1231	0.0	0.791	26.7	LOS B	168	0.93	0.90	34.6
3	R	3	0.0	0.800	32.5	LOS C	166	0.93	0.93	31.7
Approach		1298	0.0	0.791	27.3	LOS B	168	0.93	0.90	34.3
New E leg										
4	L	4	0.0	0.054	38.2	LOS C	6	0.86	0.70	29.2
5	T	23	0.0	0.054	30.0	LOS C	6	0.86	0.61	32.9
6	R	9	0.0	0.054	38.2	LOS C	6	0.86	0.70	29.2
Approach		36	0.0	0.054	33.0	LOS C	6	0.86	0.64	31.5
New N leg										
7	L	2	0.0	0.741	29.9	LOS C	154	0.90	0.90	32.9
8	T	674	0.0	0.757	23.1	LOS B	154	0.91	0.84	36.7
9	R	76	0.0	0.757	49.4	LOS D	49	1.00	0.93	25.4
Approach		752	0.0	0.757	25.8	LOS B	154	0.92	0.85	35.1
Old Wallgrove										
10	L	137	0.0	0.430	41.0	LOS C	46	0.94	0.79	28.2
11	T	36	0.0	0.429	32.8	LOS C	47	0.94	0.75	31.6
12	R	108	0.0	0.430	41.0	LOS C	47	0.94	0.79	28.2
Approach		281	0.0	0.430	39.9	LOS C	47	0.94	0.79	28.6
All Vehicles		2367	0.0	0.800	28.4	LOS B	168	0.93	0.87	33.7

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P1	1	34.2	LOS D	0	0.93	0.93
P3	1	18.2	LOS B	0	0.68	0.68
P5	1	34.2	LOS D	0	0.93	0.93



Movement Summary

Quarry Access

Future AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
New E leg										
5	T	177	0.0	0.183	0.6	LOS A	9	0.28	0.00	56.3
6	R	118	0.0	0.183	9.0	LOS A	9	0.28	0.65	47.5
Approach		295	0.0	0.183	4.0	LOS A	9	0.28	0.26	52.5
New N leg										
7	L	109	0.0	0.134	9.4	LOS A	5	0.26	0.63	47.7
9	R	15	0.0	0.134	9.6	LOS A	5	0.26	0.76	47.3
Approach		124	0.0	0.134	9.4	LOS A	5	0.26	0.65	47.6
New W leg										
10	L	19	0.0	0.066	8.2	LOS A	0	0.00	0.67	49.0
11	T	109	0.0	0.066	0.0	LOS A	0	0.00	0.00	60.0
Approach		128	0.0	0.066	1.2	LOS A		0.00	0.10	58.1
All Vehicles		547	0.0	0.183	4.6	Not Applicable	9	0.21	0.31	52.4

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



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Movement Summary

Quarry Access

Future PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
New E leg										
5	T	51	0.0	0.101	0.7	LOS A	4	0.28	0.00	56.2
6	R	92	0.0	0.101	9.1	LOS A	4	0.28	0.66	47.5
Approach		143	0.0	0.101	6.1	LOS A	4	0.28	0.42	50.3
New N leg										
7	L	124	0.0	0.136	9.2	LOS A	5	0.30	0.65	47.7
9	R	8	0.0	0.136	9.5	LOS A	5	0.30	0.74	47.5
Approach		132	0.0	0.136	9.2	LOS A	5	0.30	0.65	47.6
New W leg										
10	L	8	0.0	0.084	8.2	LOS A	0	0.00	0.67	49.0
11	T	156	0.0	0.084	0.0	LOS A	0	0.00	0.00	60.0
Approach		164	0.0	0.084	0.4	LOS A		0.00	0.03	59.3
All Vehicles		439	0.0	0.136	4.9	Not Applicable	5	0.18	0.35	52.4

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



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