

16 December 2010

Director General
 NSW Department of Planning
 23-33 Bridge Street
 Sydney NSW 2000
Attention: Chris Ritchie

Dear Chris

Re: Bungarribee Industrial Estate – Metcash Distribution Centre and Offices (MP 10_0140) – response to submissions

Further to public exhibition of the Metcash Distribution Centre and Offices – Bungarribee Industrial Estate (MP 10_0140), a number of submissions were received in relation to the project. The parties were as follows:

- Blacktown City Council (letter dated 24 November 2010);
- RTA (SRDAC) (letter dated 29 November 2010); and
- Sydney Water (letter dated 26 November 2010)

In accordance with Section 75H(6) of the *Environmental Planning and Assessment Act 1979*, the following is a response to all of the issues raised in these submission.

Blacktown City Council:

<i>Issues Raised</i>	<i>Goodman Response</i>
1. Traffic	
Traffic section has raised some issues with respect to the internal driveways, particularly;	(i) The response to these issues is clearly detailed in the Halcrow letter dated 8 December 2010 (see Attachment 1.0). The proposed shared truck and car access is based on an existing Metcash facility in Laverton and operates successfully. It also has the benefit of increasing potential for off-street queuing. We have had this arrangement reviewed and tested by Halcrow who have confirmed that it is capable of operating safely and effectively.
(i) The proposal showed a shared driveway for both heavy and light vehicles to the western boundary of the site. The shared driveway is not supported as there is a conflict between trucks and cars near the car park entry ramp. It is our view that driveways must be separated to avoid conflicts between heavy and light vehicles. This could be achieved by providing truck access as part of the precinct plan roundabout between Lots 2, 3, 4 and 6 and retaining the western access point for cars only.	
(ii) It is noted with concern that the proposal suggested the deletion of the precinct plan	(ii) A Traffic Volume Assessment and Road Safety Review has been carried out as

<p>roundabout between Lots 2, 3, 4 and 6 resulting from the removal of access road between Lots 2 and 3 without any consideration to the road safety at this location. Council does not support the deletion of this roundabout on the safety grounds as the removal of the roundabout would create a "T" intersection which requires some form of control as the predominant movement will be along the extension of Huntingwood Dr and the Great Western Highway via new roads north of the extension of Huntingwood Dr.</p>	<p>detailed in GHD letter dated 3 December 2010 (see Attachment 2.0). This letter states that a roundabout is not desirable from a safety or disruption point of view and may actually create unintended impacts such as increased delays within the development. In addition, the layout of the Metcash development (MP10_014) does not allow the space for inclusion of a roundabout at this location.</p>
<p>(iii) Traffic generated by the proposed development can be accommodated within the existing road network capacity without deletion of the precinct plan roundabout between Lots 2, 3, 4 and 6.</p>	<p>(iii) See point (ii) and the Traffic Volume Assessment carried out by GHD. The traffic generated by the proposed development can be accommodated by the proposed "T" intersection.</p>
<p>(iv) Design of car parking area, circulation aisle widths, driveway widths, manoeuvring areas, sight distances, ramp grades, headroom, loading areas etc to conform to AS 2890.1-2004 and AS 2890.2-2002.</p>	<p>(iv) These requirements will be taken into consideration during the detailed design phase to ensure that the development is consistent with the relevant Australian Standards.</p>
<p>(v) Number of parking spaces provided complies with the Council's requirements.</p>	<p>(v) Noted.</p>
<p>(vi) All vehicles must enter and leave in the forward direction.</p>	<p>(vi) Noted.</p>

2. Stormwater drainage

<p>Council's drainage section has provided a list of condition which should be included in any consent issues by the Department, namely.</p> <p>(i) The development is in the first stage of the Bungarribee Industrial Estate. On-site detention may need to be provided off-site in a temporary location until the ultimate system is provided. The detention system will need to ensure that all the post developed discharges from the 1.5 year to the 1 in 100 year ARI storm are equal to or less than the pre development flows for all storm durations and can safely contain the required storage. Details of calculations, sizes, outlets and location of the basin are to be provided.</p>	<p>(i) Sediment basins will be provided to cater for flows during construction and prior to completion of development sites as per Landcom Blue Book requirements. As noted, temporary detention may be provided off-site in the event of On-site detention at the completion of each lot will not be provided on a lot-by-lot basis as the Wetlands provide the Water Quantity treatment requirements prior to discharge to Eastern Creek.</p>
<p>(ii) The internal pipe network is to be designed in accordance with the current Council's Engineering Guide for Development to carry the 20 year ARI storm flows without surcharge.</p>	<p>(ii) The stormwater system for the Metcash development will be designed to this requirement.</p>

<p>(iii) A drainage catchment plan is required to indicate what areas are draining to specific stormwater pits. The site discharge areas draining to the north and south are to match the original layout as proposed in the WEST HUNTINGWOOD EMPLOYMENT LANDS DETAILED WSUD STRATEGY prepared by EDAW/AECOM October 2009.</p>	<p>(iii) Noted, the catchment areas for the Metcash development are being designed in accordance with the EDAW/AECOM WSUD strategy.</p>
<p>(iv) A DRAINS electronic model must be provided and approved to demonstrate that the internal pipe network can safely carry the 20 year ARI storm flows without surcharge prior to the release of the construction certificate. Blockage factors should be applied to all inlet pits with lintels/grates at 0.5 for sags and 0.2 for pits on grade. For grate only inlets the blockage factor should be 0.5 minimum.</p>	<p>(iv) The Metcash pipe network is being designed and analysed in DRAINS for the 20 year ARI and the appropriate pit blockage factors as nominated will be applied.</p>
<p>(v) Details are to be provided for the safe conveyance of overland flows within the site in the 1 in 100 year ARI event with freeboard to the floor level when the pipe and pit capacity is exceeded.</p>	<p>(v) These overland flow and freeboard requirements will be met during detailed design.</p>
<p>(vi) The water quality treatment will include gross pollutant traps targeting gross litter either as litter basket inserts, or as proprietary wet sump gross pollutant traps followed by vortex style gross pollutant traps targeting TSS and hydrocarbons as a treatment train. These are all to be designed for a minimum of the three month flow. Roof water, or the overflow from the rainwater tanks, are permitted to bypass the gross pollutant traps. Details are to be approved prior to release of the construction certificate including provision for adequate access by large eductor truck to clean the gross pollutant traps.</p>	<p>(vi) These requirements will be catered for in the detailed design of the stormwater system. GPT units will be provided for each catchment prior to connection to estate trunk stormwater system.</p>
<p>(vii) The Southern Drainage Channel within their site is to be under the ownership of the site. The owner is to be responsible for all ongoing maintenance of the channel within the site. The channel is to be heavily vegetated with native riparian vegetation. Details are to be provided prior to the release of the construction certificate.</p>	<p>(vii) It is intended that the channel will remain under the ownership of the site. The channel will be appropriately vegetated considering the maintenance regime, site constraints and hydraulic capacity. The channel needs to be able to convey large flows.</p>
<p>(viii) All discharge pipes to the Southern Drainage Channel are to comply with the requirements of Controlled Activities – Outlet Structures under the Water Management Act 2000. This is to include scour protection and</p>	<p>(viii) Noted, discharge points will be designed accordingly.</p>

energy dissipation.	
(ix) The development shall undertake good general Water Sensitive Urban Design practise e.g. by directing parking areas or driveways to gardens or grass / bio swales before collection in pits.	(ix) Noted.
(x) A drainage catchment plan is required to indicate what areas are draining to specific Stormwater Quality Improvement Devices.	(x) Noted see item (iii) Catchment Plan will be prepared as part of the detailed design process.
(xi) A minimum of 80% of the non-potable water use for the proposed development is to be met through rainwater unless physically impossible to do so. Rainwater tanks are to source water from a minimum of 80% of the roof area. Details of non-potable water usage rates and how the percentage reuse has been achieved need to be provided prior to the release of the construction certificate. Where recycled water is available this must only be used to supplement any rainwater, or stormwater harvesting and reuse schemes e.g. as a top up to the rainwater tank, or in lieu of mains water bypass.	(xi) As per discussions with Council regarding the Infrastructure Development Application (MP08_225). Goodman and Council agreed that 80% could become the revised target 'unless impractical'.
(xii) A hydraulic engineer is to prepare a preliminary non-potable water supply, pipe and fixture plan for the site.	(xii) Noted, this plan will be prepared as part of the detailed design process.
(xiii) Prior to the release of the construction certificate, maintenance requirements are to be provided for each of the Stormwater Quality Improvement Devices and the riparian vegetation of the Southern Drainage Channel.	(xiii) maintenance information will be finalised during the detailed design process, details of which will be incorporated with the Works-As-Executed documents prior to operations.
(xv) Prior to Occupation a Positive Covenant is to be provided over the Stormwater Quality Improvement Devices in accordance with the requirements with Council's Engineering Guide for Development (as amended).	(xv) Noted.
(xvi) Prior to Occupation a Positive Covenant is to be provided over the Southern Drainage Channel within the site for maintenance of the riparian vegetation.	(xvi) Noted.
3. Planning	
The main aspect of Council's original submission dated 24 August, 2010 particularly with respect to the issue of Salinity. Given that high levels of salinity have been identified	Noted.

under the GHD Geotechnics report dated February 2009, it is considered imperative that the Management measures and monitoring recommendations made by this report are adhered to. The other matters relating to architectural design, landscaping and screen treatment of the water tank have been addressed satisfactorily.

Given the technical nature of the above comments, Goodman commit to consult with Blacktown City Council regarding the technical design of the stormwater system to the satisfaction of the Director-General.

RTA (SRDAC):

The following is a response to the issues raised:

Issues Raised	Goodman Response
Transport Infrastructure Contributions Deed	
(a) GHWT (Trust Company Limited as custodian of the GGAIF Huntingwood West Trust) shall pay the contributions due in respect of the GHWT Land (Lot 3 DP1127100) (or deliver Works in Kind) to the RTA (or as it directs in writing) in accordance with the signed Transport Infrastructure Contribution Deed between the Roads and Traffic Authority, Trust Company Limited and the Minister Administering the Environmental Planning and Assessment Act, 1979, dated 13 September 2010.	(a) Noted and agreed.
(b) GHWT (Trust Company Limited as custodian of the GGAIF Huntingwood West Trust) shall enter into a GHWT Works WAD for the GHWT Works in accordance with the signed Transport Infrastructure Contributions Deed between the Roads and Traffic Authority, Trust Company Limited and the Minister Administering the Environmental Planning and Assessment Act, 1979 dated 13 September 2010.	(b) Noted and agreed.
(c) GHWT must give written notice to the RTA within 10 days of the lodgement of an Application for a Construction Certificate, where the issuing of that certificate would constitute a Development Event in accordance with the signed Transport Infrastructure Contribution Deed between the Roads and	(c) Noted and agreed.

Traffic Authority, Trust Company Limited and the Minister Administering the Environmental Planning and Assessment Act, 1979 dated 13 September 2010.

(d) Should GHWT direct that contributions are to be made and not Works in Kind, payment must be made to the RTA and directed to:

The Land Use and Planning Manager

PO Box 973

PARRAMATTA NSW 2124

(d) Noted and agreed.

Advisory Comments

(1) To eliminate vehicle conflicts between bicycles, light and heavy vehicles at the entry/exit to the site, the Department should consider requesting the applicant to redesign the entry/exit to separate heavy and light vehicles. This could be achieved by providing separate driveways for the car parking area and the heavy vehicle access.

(1) The response to these issues is clearly detailed in the Halcrow letter dated 9 December 2010 (see Annexure 3.0). The proposed shared truck and car access is based on an existing Metcash facility in Laverton and operates successfully. It also has the benefit of increasing potential for off-street queuing. We have had arrangement reviewed and tested by Halcrow who have confirmed that it is capable of operating safely and effectively.

(2) A Construction Traffic Management Plan detailing construction vehicle routes, number of trucks, hours of operation, access arrangements and traffic control should be submitted to Council prior to the issue of a Construction Certificate.

(2) Noted, this will be prepared and submitted to DoP.

(3) The layout of the proposed car parking areas associated with the subject development (including driveways, grades, turn paths, sight distance requirements, aisle widths, aisle lengths, and parking bay dimensions) should be in accordance with AS 2890.1-2004 and AS 2890.2 -2002 for heavy vehicle usage.

(3) These requirements will be taken into consideration during the detailed design phase to ensure that the development is consistent with the relevant Australian Standards.

(4) The swept path of the longest vehicle (including garbage trucks) entering and exiting the subject site, as well as manoeuvrability through the site, shall be in accordance with AUSTROADS. In this regard, a plan shall be submitted to Council for approval, which shows that the proposed development complies with this requirement.

(4) Noted. The turning paths have been provided as part of the detailed design process as an extension to the Traffic Impact Assessment contained within the Development Application.

(5) All vehicles are to enter and leave the site in a forward direction.

(5) Noted.

(6) All vehicles are to be wholly contained on site before being required to stop.	(6) Noted, the driveway entry where currently located allows for significant number of B-Double vehicles to queue off the street network.
(7) All works/regulatory signposting associated with the proposed development are to be at no cost to the RTA.	(7) Noted and agreed.

Sydney Water:

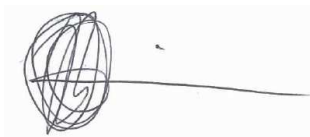
The comments and feasibility advice provided by Sydney Water is noted, Goodman will continue to consult with Sydney Water through our Water Services Coordinator on design and Section 73 requirements.

Operational Traffic Volumes:

Further to the Traffic Impact Assessment prepared by Halcrow dated 8 September 2010 (as contained within the Development Application), the expected daily operational traffic volumes for the Metcash site is approximately 7 to 7.5 times the AM peak volumes referenced on page 10 of the report which equates to 600 trucks (or other heavy vehicles) and 1000 cars (or other light vehicles).

Should you wish to discuss further please do not hesitate to contact the undersigned on (02) 9230 7402.

Yours sincerely,

A handwritten signature in black ink, appearing to be "Brendon Quinn", written over a light grey rectangular background.

Brendon Quinn
Development Manager

Attachments:

- Attachment 1.0: Halcrow letter dated 8 December 2010
- Attachment 2.0: GHD letter dated 3 December 2010
- Attachment 3.0: Halcrow letter dated 9 December 2010

Halcrow

Suite 20, 809 Pacific Highway, Chatswood NSW 2067 Australia

Tel +61 2 9410 4100 Fax +61 2 9410 4199

www.halcrow.com/australasia



Brendon Quinn
Development Manager
Level 10
60 Castlereagh Street
Sydney NSW 2000

Thursday 8th December 2010

Our ref CTLRLCI01a

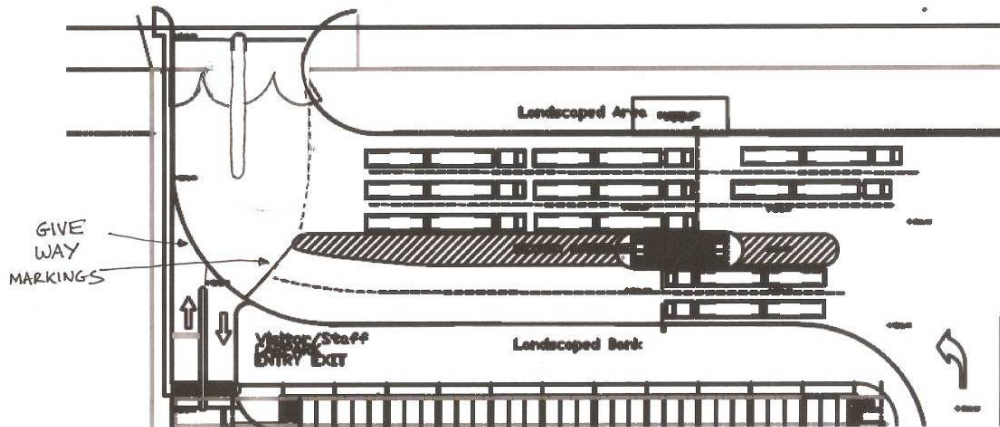
Dear Brendon,

Metcash, Huntingwood Drive

I refer to council's letter dated 24th November 2010 about the above site which you forwarded to me this week. I will respond to the first two traffic issues raised in the letter. Issues iii, iv, v & vi in Council's letter are all noted and accepted.

- (i) The proposal showed a shared driveway for both heavy and light vehicles to the western boundary of the site. The shared driveway is not supported as there is a conflict between trucks and cars near the car park entry ramp. It is our view that driveways must be separated to avoid conflicts between heavy and light vehicles. This could be achieved by providing truck access as part of the precinct plan roundabout between Lots 2, 3, 4 and 6 and retaining the western access point for cars only.

The potential of conflict between heavy and light vehicles near the car park entry ramp was considered during the design process. The more detailed proposal, which is not shown clearly on the submitted masterplan, involves a scheme to manage traffic priority at this location by means of give way intersection controls as shown on the sketch below.



The proposed layout will have the following features

- The location of the driveway relative to the gatehouse allows for a large number of B-doubles to park prior to the gatehouse, which gets them off the street network thereby not blocking cars wishing to enter the site / car park (*as is the case on other entrances on Huntingwood Drive to the east*)
- Trucks will be leaving the gatehouse via boom gates and then travelling at low speed before stopping at the Give Way line further west.
- The boom gates will not allow a continuous chain of B-Doubles exiting the gatehouse which means that cars will find adequate gaps to emerge from the car park.
- Cars leaving the car park will also be required to give way. They will need to give way when trucks are emerging from their Give Way line. This truck movement will be at low speed and therefore should not result in any adverse safety conditions.
- The traffic report confirmed that the proposed site would generate the following traffic levels in the peak hours

Table 4.2 - Estimated Traffic from Proposed Huntingwood West Estate

	Trucks	Car Park	TOTAL
AM Peak	78	140	218
PM Peak	33	176	209

Of the 78 trucks arriving in the AM peak, 39 will be arriving and 39 will be leaving.
 Of the 140 cars arriving in the AM peak, 132 will be arriving and 8 will be leaving.

With regard to the councils concerns, the potential conflict in the AM peak would be between 39 trucks leaving the site and 8 vehicles leaving the car park (*the in vehicles will not conflict*). The proposed give way system would not raise any adverse safety concerns.

Of the 33 trucks arriving in the PM peak, 15 will be arriving and 18 will be leaving.
 Of the 176 cars arriving in the PM peak, 19 will be arriving and 157 will be leaving.

With regard to the councils concerns, the potential conflict in the PM peak would be between 18 trucks leaving the site and 157 vehicles leaving the car park (*the in vehicles will not conflict*). The proposed give way system would not raise any adverse safety concerns.

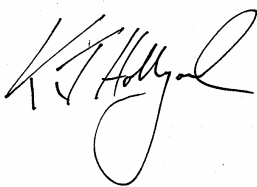
The traffic report has also confirmed that the proposed site access serving both truck and car traffic will not result in queuing problems so the single access point is acceptable in terms of traffic capacity. We also believe that the proposed layout will also be acceptable on road safety grounds.

- (ii) It is noted with concern that the proposal suggested the deletion of the precinct plan roundabout between Lots 2, 3, 4 and 6 resulting from the removal of access road between Lots 2 and 3 without any consideration to the road safety at this location. Council does not support the deletion of this roundabout on the safety grounds as the removal of the roundabout would create a "T" intersection which requires some form of control as the predominant movement will be along the extension of Huntingwood Dr and the Great Western Highway via new roads north of the extension of Huntingwood Dr.

As stated in the report, the proposed access location is over 100m west of the proposed road running north between Lot 4 and Lot 6 so a four arm roundabout is not an option to connect these roads. The provision of a tee intersection onto the subject site has been shown in the Traffic impact assessment to be acceptable. Should council wish to locate a roundabout at the intersection that will be formed when Lots 4 and 6 are developed, this should not be affected by the access into the Metcash site

I trust that this addresses the issues raised but feel free to give me a call should you require anything further.

Yours sincerely



Ken Hollyoak
Associate (Transport Planning)



03 December 2010

Mr Brendon Quinn

Our ref: 21/18115/165841
Your ref:

Goodman International
Level 10
60 Castlereagh St
Sydney NSW 2000

Dear Brendon

Bungarribee Industrial Estate, Huntingwood West Response to BCC Comments on Roundabout at Huntingwood Drive

This letter outlines GHD's proposed response to the comments from Blacktown City Council pertaining to the proposed treatment at the intersection of Road 3 and Road 4 in the Bungarribee Estate – Huntingwood West Development.

Blacktown City Council submission comments:

"A roundabout shall be constructed at the intersection of proposed road (no.3 and 4). This roundabout must be designed to ensure that the turning path, deflection and other requirements set out in Austroads "Guide to Traffic Engineering Practice - Roundabouts Part 6" have been complied with. The roundabout must have a non-mountable central island surrounded by a mountable annulus. The design and construction is to incorporate signposting, line marking, landscaping, increase in kerb return radii, the capital cost of street lighting to Integral Energy requirements, reinstatements, service relocations and adjustments and any other work required to make a smooth connection to existing construction and any other associated costs. The roundabout is also to be designed to accommodate B-Double and is to incorporate provision for cyclists to cross traffic at right angles in a safe manner."

Council's basis for requiring a roundabout as the preferred intersection treatment for Road 3 and Road 4 is unclear. We propose to assess the intersection treatments for Road 3 and Road 4 from both a traffic volume assessment and road safety perspective.

1 Intersection Traffic Volume Assessment

The AUSTROADS publication *"Guide to Traffic Engineering Practice – Part 6: Roundabouts"* needs to be referred to in conjunction with the other parts of the Guide, in particular *Part 5: Intersections at Grade* and the more recent *Guide to Traffic Management Part 6: Intersections*. These guides outline the process of developing options and selecting a preferred treatment for at-grade.

1.1 Development of Primary Traffic Control Options

The AUSTROADS *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* outlines that in developing intersection control options, "it is normal to initially provide the lowest level of



traffic management at any intersection, subject to traffic and site conditions.” The Guide also outlines these options and the safety factors considered in their selection in a table, shown below:

Table 2.2: Intersection control options and selection criteria

Type of control	Key traffic and safety selection factors	References
Road rules only	<ul style="list-style-type: none"> ▪ apply in the absence of intersection traffic control devices ▪ common practice at T-intersections between local streets where traffic control devices may not be provided ▪ cross roads generally have traffic control devices, however, they need not be provided on very low volume roads in remote areas where a major/minor road hierarchy does not exist (Note that New Zealand requires all cross roads to be controlled). 	Refer to Australian Road Rules and New Zealand Land Transport Rules
GIVE WAY lines only (Not in New Zealand)	<ul style="list-style-type: none"> ▪ may be used at local street T-intersections to reinforce priority although an appropriate sign (STOP or GIVE WAY) may be required in these circumstances. 	Refer to Australian Road Rules and New Zealand Land Transport Rules, and Parts 4 and 10 of the Guide to Traffic Management
STOP signs and GIVE WAY signs	<ul style="list-style-type: none"> ▪ used at intersections other than those controlled by roundabouts or traffic signals ▪ used to reinforce road rules or to assign priority ▪ STOP signs must only be used when warrant is met ▪ advance warning signs may be necessary where there is a high approach speed or where approach sight distance is limited. 	Refer to Part 10 of the Guide to Traffic Management and to AS1742.2
Roundabout	<ul style="list-style-type: none"> ▪ Can be used at a wide range of sites and improve safety by simplifying conflicts, reducing speeds and providing clear indication of priority ▪ Are useful where there is a high proportion of right turning traffic. ▪ Perform best when traffic flows are balanced. ▪ Cyclists (especially when turning right) and pedestrians find it more difficult to negotiate multi-lane roundabouts. An off-road facility may be required for cyclists in some cases. 	Refer to Parts 4 and 10 of the Guide to Traffic Management and to AS1742.2
Traffic signals	<ul style="list-style-type: none"> ▪ used where unsignalised intersection has a poor crash record or excessive delays for traffic using minor roads, and a roundabout is an unsuitable alternative to traffic signals ▪ suitable for high pedestrian movement including people who have an impairment ▪ numerical warrants may apply (refer signalised intersections in Table 2.4 below). 	Refer to Parts 5 and 10 of the Guide to Traffic Management

Source: Table 2.2, AUSTRROADS Guide To Traffic Management Part 6 : Intersections, Interchanges And Crossings.

Among the key selection factors noted for roundabouts is that they perform best when traffic flows are balanced. The road network layout in Huntingwood West presents an unbalanced traffic flow, i.e. major flows are undertaking a right-angle turn. In this regard, there are likely performance constraints in constructing a roundabout at the intersection of Road 3 and Road 4.

1.2 Suitability of Treatment Options

In Table 2.3 of AUSTRROADS *GTM Part 6: Intersections, Interchanges and Crossings*, the different intersection treatment options are presented in terms of their suitability in relation to different road classifications (shown below).



GUIDE TO TRAFFIC MANAGEMENT PART 6: INTERSECTIONS, INTERCHANGES AND CROSSINGS

Table 2.3: Suitability of types of traffic control to different road types

	Primary Arterial	Secondary Arterial	Collector & Local Crossing Road	Local Street
Traffic Signals				
Primary arterial	A	A	O	X
Secondary arterial	A	A	O	X
Collector & local crossing road	O	O	X	X
Local street	X	X	X	X
Roundabouts				
Primary arterial	O	O	X	X
Secondary arterial	O	O	O	X
Collector & local crossing road	X	O	A	O
Local street	X	X	O	A
STOP or GIVE WAY signs				
Primary arterial urban/(rural)	X / (O)	X / (O)	A	A
Secondary arterial urban/(rural)	X / (O)	X / (O)	A	A
Collector & local crossing road	A	A	A	A
Local street	A	A	A	A
Legend:				
A = Most likely to be an appropriate treatment				
O = May be an appropriate treatment				
X = Usually an inappropriate treatment				

Source: AUSTRROADS Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings.

It is noted that for intersections of collector roads with local streets, STOP or GIVE WAY intersection treatments are considered to be most likely to be appropriate, while roundabouts may be appropriate.

1.3 Appropriateness of Roundabouts

In Section 2.4 of the *AUSTRROADS Guide to Traffic Engineering Practice — Part 6: Roundabouts* (1993) inappropriate sites for roundabouts are indicated. Among those listed are situations “where large combination vehicles or over-dimensional vehicles frequently use the intersection and insufficient space is available to provide for the required geometric layout.” As the primary land use for Huntingwood West is light industrial, it is expected that a significant portion of traffic flows within the development will be large trucks, including B-Doubles, which is also mentioned in the Council submission.

The Road 3 – Road 4 intersection is at a location where the main dominant flows along the main route will be executing either a 90-degree or a 270-degree manoeuvre. Minor movements will be into and out of the individual developments. Having a roundabout treatment at the intersection will likely increase traffic delay impacts for the major traffic flow movements.



1.4 Options Evaluation Criteria

In addition to the development of intersection treatment options, Section 2.3 of AUSTRROADS GTM Part 6 identify five criteria which should be addressed as a minimum requirement in selecting a preferred intersection treatment option. These are:

- Safety;
- Delay;
- Site suitability;
- Financial analysis; and
- Environmental issues.

1.4.1 Safety

Among the key safety considerations are sight lines and vehicle turning paths. It is noted that inclusion of B-Doubles in a roundabout option would expand the land take of the intersection that would also potentially impact on the financial analysis criterion. The evaluation of options relating to safety can potentially be undertaken through the conduct of road safety reviews.

1.4.2 Delay

Given the likely peak volumes within Huntingwood West (less than 500 vph), a roundabout option may impose additional delays associated with longer turning manoeuvres to the right-turning major flows, compared with an unsignalised intersection treatment.

1.4.3 Site suitability

As indicated in the overview of options, a roundabout may not be suitable to the particular site given the fact that the major flows are following a 90-degree angle.

1.4.4 Financial analysis

The land requirements for a roundabout intersection treatment within an industrial area will impose an additional financial burden without a clear rationale that the additional cost of a roundabout will bring additional benefits that an unsignalised intersection will not be able to deliver.

1.4.5 Environmental issues

The longer turning manoeuvres for the major traffic flow movements associated with a roundabout will likely increase the overall vehicle-kilometres travelled (VKTs) within the development, as well as potentially increase traffic-related emissions associated with the higher VKTs.



2 Road Safety Review

A road safety review was undertaken on the following:

- The proposed unsignalised T- intersection at intersection of road 3 & 4; and
- A roundabout at the intersection of road 3 & 4;

The road safety design review follows standard practice of identifying safety related issues relating to the design and documentation. A road safety review has been proposed rather than a road safety audit as the site inspections (both day and night) were deemed not to be required. The road safety review conducts a desktop assessment of design and documentation only.

Standard issues such as design standards, typical cross sections, horizontal geometry, vertical geometry, visibility, sight distance, layout, readability by drivers, signs, linemarking, vehicles types, and other road users were assessed with respect to safety.

The review is structured around a standard checklist provided in the Austroads "Road Safety Audit Manual: 2nd Edition" and RTA's "Accident Reduction Guide – Part 2: Road Safety Audits".

Reference material used for the safety review includes;

- Austroads "Road Safety Audit Manual" (Second Edition), 2002;
- RTA "Accident Reduction Guide – Part 2: Road Safety Audits", 2005;
- RTA "Road Design Guide", 2002;
- Standards Australia "AS 1742 Manual of uniform traffic control devices"; and
- Austroads Guide to Road Safety, 2006;

2.1 Road Safety Findings

2.1.1 Un signalised T-Intersection

The following comments related to the proposed unsignalised priority controlled intersection of Road 3 and 4 currently documented by GHD.

The subdivision is an industrial subdivision with a design speed of 60km/hr and is design for use by vehicles up to B-double in size. These design standards appear to be appropriate for the surrounding development and the design intention. The typical cross section is wide and appropriate for heavy vehicle use with 5.25m lanes in either direction with an allowance a for future protected right turn bay and provision for kerb side parking.

The horizontal and vertical geometry is straight and flat with a vertical grading of 2-2.5%. The intersection of Road 3 and 4 occurs on a sag vertical curve with a suitable k value of 100. The intersection is visible with appropriate sight distance requirements for Stopping Sight Distance (SSD), Approach Sight Distance (ASD) and Safe Intersection Sight Distance (SISD).

The T-intersection layout is readable by the intended drivers and is an appropriate type for this location, however linemarking and signage would need to be further developed.



2.1.2 Roundabout

Whilst there are not any significant safety limitations to the use of a roundabout at this location the following comments have been made in regards its suitability:

- Nuisance Crashes. The design intent is for the design of an industrial subdivision road for use by heavy vehicles including B-doubles. The turning movements of these types of vehicle are large and will increase the size and type of roundabout required. The use of a roundabout intersection will increase the likelihood of “nuisance” accidents and maintenance of the road furniture and signage located in the roundabouts central and splitter islands;
- Flow. The use of a roundabout is ideal where traffic flows are balanced and can improve safety significantly at four way intersections. The use of a roundabout in this location doesn’t fit with these selection criteria due to:
 - Initially there are no turning movements required, ie the intersection being staged;
 - Traffic flows are not balance, future dominant right turn movement from road 4 to road 3; and
 - Annoyance for heavy vehicle drivers due to the reverse steering movement required.
- Cost. The cost of a roundabout verses a T-intersection would be hard to justify at this location. There is not a significant safety improvement between to two types; and
- Proximity: Roundabouts can be useful items in safety initiatives such as traffic calming and speed control measures, however with the close proximity of the road 3 and 4 intersection to the roundabout intersection with Huntingwood Drive (210m away) any such benefit is lost.

3 Conclusion

In summary, it appears that the requirement for a roundabout intersection treatment for Road 3 and Road 4 does not a pose a significant safety improvement between the two intersection treatment types discussed above. Following the traffic volume assessment and the road safety review with consideration to the cost, disruptions to the traffic flow and nuisance crashes the installation of a roundabout at the intersection of road 3 and road 4 would not be necessary and an unsignalised t-intersection, with appropriate linemarking and signage, would be more suitable. It may actually also create unintended impacts such as increased delays and overall vehicle-kilometres travelled (VKTs) within the development.

Yours faithfully
GHD Pty Ltd

Frank Carrozza
Senior Civil Engineer
02 8898 8886

Halcrow

Suite 20, 809 Pacific Highway, Chatswood NSW 2067 Australia
Tel +61 2 9410 4100 Fax +61 2 9410 4199
www.halcrow.com/australasia



Brendon Quinn
Development Manager
Level 10
60 Castlereagh Street
Sydney NSW 2000

Thursday 9th December 2010

Our ref:- CTLRLCI02

Dear Brendon,

Metcash, Huntingwood Drive

I refer to SRDAC's letter dated 29th November 2010 about the above site which you forwarded to me this week. I will respond to the first of the advisory comments in detail later in this letter below but in relation to the other points raised:-

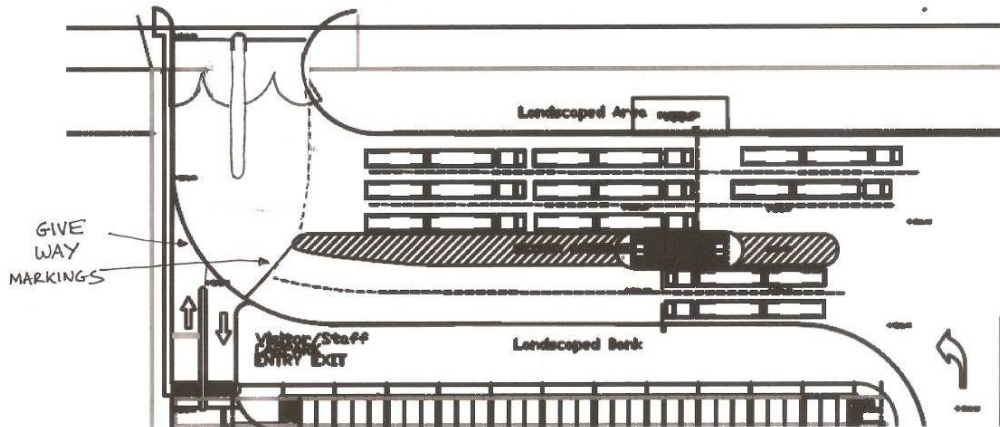
- a CTMP will be produced prior to the issue of a construction certificate
- the car park / access roads have been designed in accordance with Australian standard
- The swept paths of the largest vehicle were provided in Appendix C of Halcrow's traffic impact assessment
- All vehicles will enter and leave in a forward direction
- All vehicles will be contained within the site without being required to stop
- All works / regulatory signposting will be at no cost to RTA.

The first point in the letter was as follows:-

1. To eliminate vehicle conflicts between bicycles, light and heavy vehicles at the entry/exit to the site, the Department should consider requesting the applicant to redesign the entry/exit to separate heavy and light vehicles. This could be achieved by providing separate driveways for the car parking area and the heavy vehicle access.

The potential of conflict between heavy and light vehicles near the car park entry ramp was considered during the design process. However, it was considered that a single access point could cope adequately with all movements both in terms of traffic capacity and road safety.

The more detailed proposal, which is not shown clearly on the submitted masterplan, involves a scheme to manage traffic priority at this location by means of give way intersection controls as shown on the sketch below.



The proposed layout will have the following features

- The location of the driveway relative to the gatehouse allows for a large number of B-doubles to park prior to the gatehouse, which gets them off the street network thereby not blocking cars wishing to enter the site / car park (*as is the case on other entrances on Huntingwood Drive to the east*) – that accords with the RTA requirement that *'all vehicles will be contained within the site without being required to stop'*
- Trucks will be leaving the gatehouse via boom gates and then travelling at low speed before stopping at the Give Way line further west.
- The boom gates will not allow a continuous chain of B-Doubles exiting the gatehouse which means that cars will find adequate gaps to emerge from the car park.
- Cars leaving the car park will also be required to give way. Cars will need to give way when trucks are emerging from their Give Way line. This truck movement will be at low speed and therefore should not result in any adverse safety conditions.
- The traffic report confirmed that the proposed site would generate the following traffic levels in the peak hours

Table 4.2 - Estimated Traffic from Proposed Huntingwood West Estate

	Trucks	Car Park	TOTAL
AM Peak	78	140	218
PM Peak	33	176	209

Of the 78 trucks arriving in the AM peak, 39 will be arriving and 39 will be leaving.
 Of the 140 cars arriving in the AM peak, 132 will be arriving and 8 will be leaving.

With regard to the concerns about conflict, the potential conflict in the AM peak would be between 39 trucks leaving the site, 8 vehicles leaving the car park and around 8 cyclists (*the in vehicles will not conflict*). The proposed give way system would not raise any adverse safety concerns.

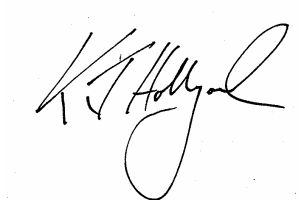
Of the 33 trucks arriving in the PM peak, 15 will be arriving and 18 will be leaving.
 Of the 176 cars arriving in the PM peak, 19 will be arriving and 157 will be leaving.

With regard to the potential conflict in the PM peak, there would be between 18 trucks leaving the site, 157 vehicles leaving the car park and around 8 cyclists (*the in vehicles will not conflict*). The proposed give way system would not raise any adverse safety concerns.

The traffic report has also confirmed that the proposed site access serving both truck and car traffic will not result in queuing problems so the single access point is acceptable in terms of traffic capacity. We also believe that the proposed layout will be acceptable on road safety grounds.

I trust that this addresses the issues raised but feel free to give me a call should you require anything further.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Ken Hollyoak', written over a light grey rectangular background.

Ken Hollyoak

Associate (Transport Planning)