# Construction Traffic Management Plan

*Cardno*

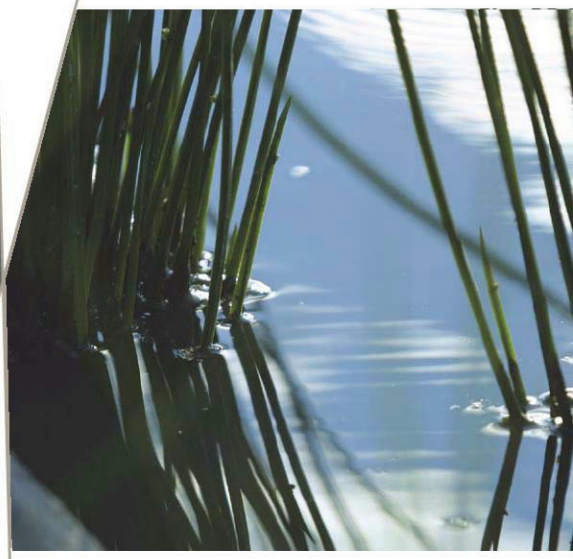
Attachment G

JBA 13070

# Central Precinct – St Marys ADI Site

## Proposed Haul Road – Construction Traffic Management Plan

89914020



Prepared for
Lend Lease

May 2014

Cardno
Shaping the Future

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# 1 Introduction

Cardno has been commissioned by Lend Lease to prepare a Construction Traffic Management Plan (CTMP) for the construction of a haul road to accommodate construction traffic associated with the proposed development of the Central Precinct. The Central Precinct forms part of the broader St Marys ADI site and is located within the Penrith City Council Local Government Area (LGA).

The proposed haul road will be constructed to the north-west of Links Road, to the west of the intersection with Dunheved Circuit. This haul road (identified as Road 001) will run north along the western boundary of the future Dunheved Precinct and will connect Links Road with a private road (known as Road 002), running east to west, that lies approximately 1km north.

The proposed haul road traverses Blacktown City Council and Penrith City Council LGAs and sits wholly within a road reserve approved under the Dunheved Precinct Development Application.

## 1.1 Project Background

It is understood that the Central Precinct St Marys ADI site development will require approximately two million cubic metres of fill material to be imported to provide a land platform above the regional flood levels. As such, an appropriate haul road needs to be constructed for importing this volume of fill and to accommodate general construction traffic.

It is currently estimated that approximately 20,000 cubic metres of material will need to be imported to site in order to construct the proposed haul road, over a period of three to six months, commencing in the final quarter of 2014.

## 1.2 Scope of Works

The following scope of works has been addressed within this report;

> A review of background information in relation to proposed works and the project objectives;

> A desktop study which reviews the proposed haulage routes for fill importation in light of RMS approved heavy vehicle routes, existing land uses and road network characteristics;

> Identification of the construction program, hours of operation and the capacity of each truck in order to estimate the number of truck movements added to the external road network during the construction period;

> A qualitative assessment of the anticipated traffic impacts arising from construction vehicles at key intersections;

> Assess the requirements / suitability of the access arrangement, as per the AustRoads Guidelines, for the proposed Links Road / Road 001 access;

> Provide a sight distance assessment as outlined in AustRoads Guidelines for the proposed new access intersection of Links Road/Road 001;

> Develop an indicative signage plan for work zones established and propose appropriate management strategies for the construction stage.

> Assess the suitability of the proposed temporary truck parking provisions based on empirical information available.

> Discuss and propose suitable safeguards and mitigation measures to manage/minimise the temporary impact of the works.

# 2 Existing Situation

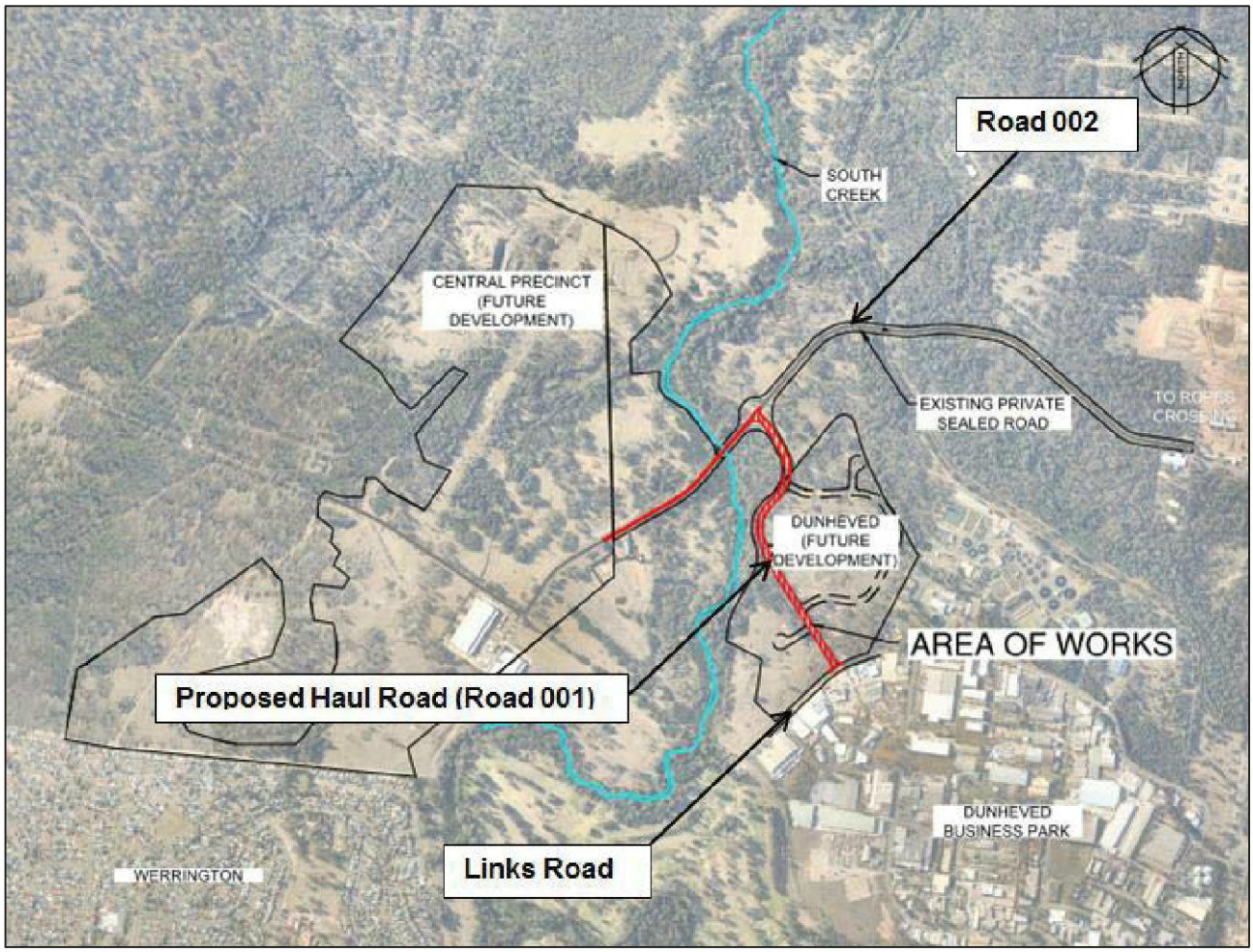
## 2.1 Site Location

The proposed haul road alignment is located within the Penrith and Blacktown LGAs. The haul road is located north of Links Road and is bounded by Links Road to the south, Triggs Street to the east, an unnamed private road (known as Road 002) to the north and a large Greenfield area (which includes the South Creek) to the west.

The haul road intersection with Links Road is located within the Penrith LGA.

The haul road (also known as Road 001) is located to the north-west of Links Road to the west of the intersection with Dunheved Circuit. The haul road will run approximately 1km north-west until it connects to Road 002. As such, once the haul road is in place, the importation of fill and generic construction traffic associated with the construction of the Central Precinct can access the Central Precinct by travelling north-west on Road 001 and turning southwest at the Road 001/Road 002 intersection.

The haul road alignment road network is depicted in **Figure 2-1** below.




*Source: Nearmaps*

**Figure 2-1 Site Location**

## 2.2 Existing Road Network

Roads are usually classified under two road classification systems. One is the Roads Maritime Services (RMS) administration classification system and the other is the road hierarchy classification system. RMS classifies roads as State Roads, Regional Roads or Local Roads. The road hierarchy system classifies roads as Arterial, Sub-arterial, Collector or Local roads.

A State Road, as classified by RMS is wholly under care and control of RMS. Regional Roads are under the care and control of Council but may receive maintenance funding from RMS. Local Roads are wholly under the care and control of the Council.

Roads are classified under the road hierarchy based on their functional role within the road network and are used to determine the design standards for the road and access to the road from adjacent properties along the road.

### 2.2.1 Links Road

Links Road is located on the southern extent of the Dunheved Precinct and is local road extending approximately 3 kilometres in a west-east direction between Forrester Road in the east and greenfield in the west. Links Road is a two-way two-lane carriageway (one lane in each direction) in each direction with an approximate carriageway width of 8 metres. Links Road provides direct access to the Sydney Water Maintenance Depot and the St Marys Sewage Treatment Plant as well as access to some industrial and commercial properties. Limited pedestrian facilities are provided along the length of Links Road with the carriageway width allowing sufficient space for unrestricted parking provisions. A posted speed limit of 60 km/h applies to Links Road.

### 2.2.2 Forrester Road

Forrester Road is located to the east of the Dunheved Precinct and is a regional road extending approximately 4 kilometres in a north-east / south-west direction between Palmyra Avenue and Harris Street. Forrester Road is a dual carriageway with an approximate carriageway width of 15 metres. It should be noted between Links Road and Harris Street a median of varying widths, between 2.5 metres and 16 metres is constructed. Pedestrian facilities are provided on the western verge of Forrester Road with limited parking provision provided along the length of the road. A posted speed limit of 60 km/h applies to Forrester Road.

### 2.2.3 Christie Street

Christie Street is a regional road located to the south of the Dunheved Precinct, extending approximately 2 kilometres in an east-west direction between Forrester Road and Dunheved Road. Christie Road has a two lane undivided carriageway with a width of approximately 13m. Pedestrian facilities are provided along the southern verge of Christie Street with general unrestricted parking permitted along the length of the street. A posted speed limit of 60km/h applies to Christie Street.

### 2.2.4 Werrington Road

Werrington Road is regional road located to the south of the Dunheved Precinct, extending approximately 2 kilometres in a north-south direction between Christie Street / Dunheved Road and Great Western Highway. Werrington Road comprises of one traffic lane undivided in each direction with an approximate carriageway width of 12 metres. Pedestrian/parking facilities are not provided along the entirety of Werrington Road. A posted speed limit of 70km/h applies to Werrington Road.

### 2.2.5 Great Western Highway

Great Western Highway is a State road that is located to the south of the Dunheved Precinct. The highway extends approximately 210 kilometres in an east-west direction, with access to the highway achieved via Werrington Road from the Precinct. Within close proximity to the site, Great Western Highway comprises of six-lane two-way carriageway with an approximate carriageway width of 25 metres. A posted speed limit of 60km/h applies to Great Western Highway.

### 2.2.6 Mamre Road

Mamre Road is a State road that is located to the south of the Dunheved Precinct. The road extends approximately 13 kilometres in north-west direction, extending between Great Western Highway and Elizabeth Drive. Mamre Road is an undivided dual carriageway with an approximate carriageway width of 13 metres. Pedestrian facilities are provided on both the east and western verges with parking provision generally not provided along the entirety of the length of the road. A posted speed limit of 60km/h applies to Mamre Road.

### 2.2.7 Intersection – Forrester Road / Links Road / Ropes Crossing Boulevard

The intersection of Forrester Road / Links Road / Ropes Crossing Boulevard is roundabout controlled. The intersection layout is presented in **Figure 2-1** and has the following features:

- Forrester Road (eastern approach)
  - 1x through/right turn lane; and
  - 1x left continuous slip lane continuing along Forrester Road.
- Forrester Road (southern approach)
  - 1x through/left turn lane; and
  - 1x right turn lane.
- Links Road (western approach)
  - 1x through/left turn lane; and
  - 1x through/right turn lane.
- Ropes Crossing Boulevard (northern approach)
  - 1x through/right turn lane; and
  - 1x left slip lane into Forrester Road.

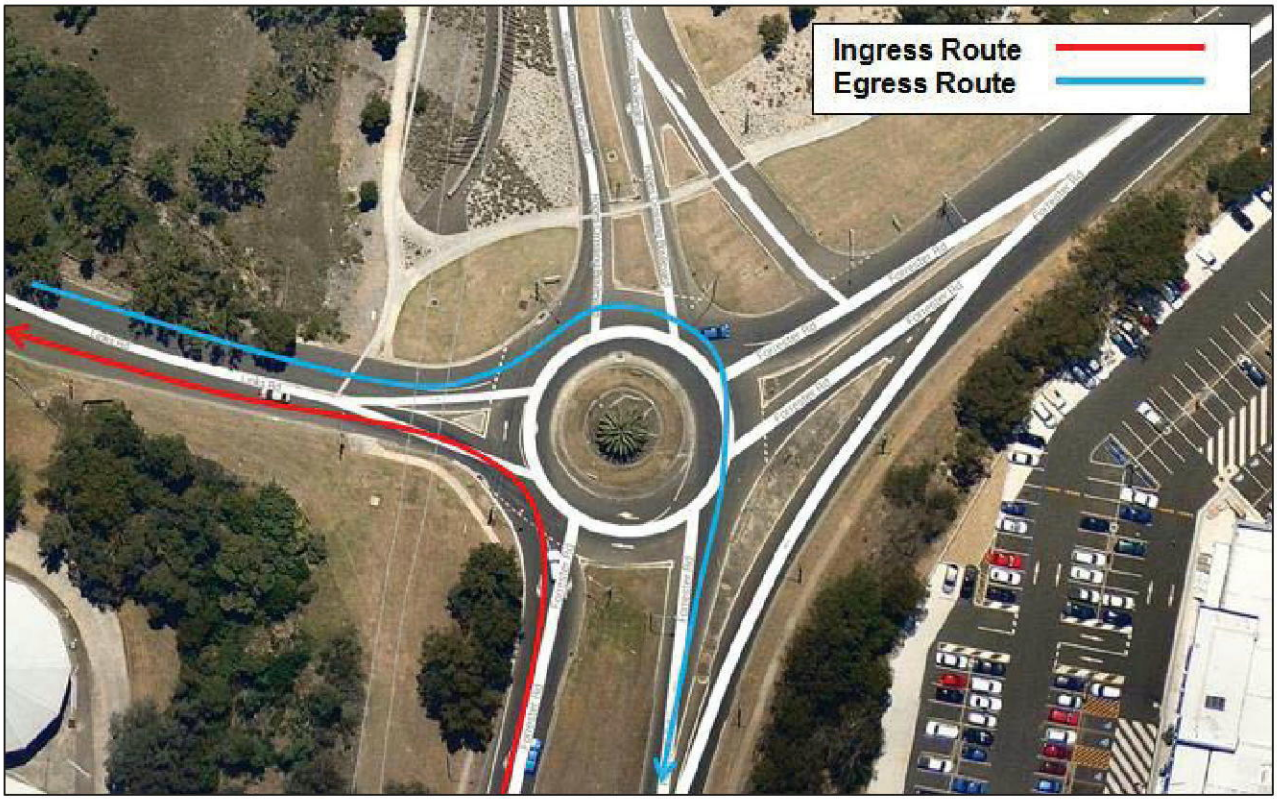



**Figure 2-1 Intersection of Forrester Road / Links Road / Ropes Crossing Boulevard**

### 2.2.8 Intersection – Links Road / Proposed Haul Road

The proposed intersection along of the haul road with Links Road is to be under a give way control. The proposed intersection configuration is to have the following features:

> Links Road (eastern approach)
  - 1x through/right turn lane.
> Links Road (western approach)
  - 1x through/left turn lane.
> Proposed haul road (northern approach)
  - 1x left/left turn lane.

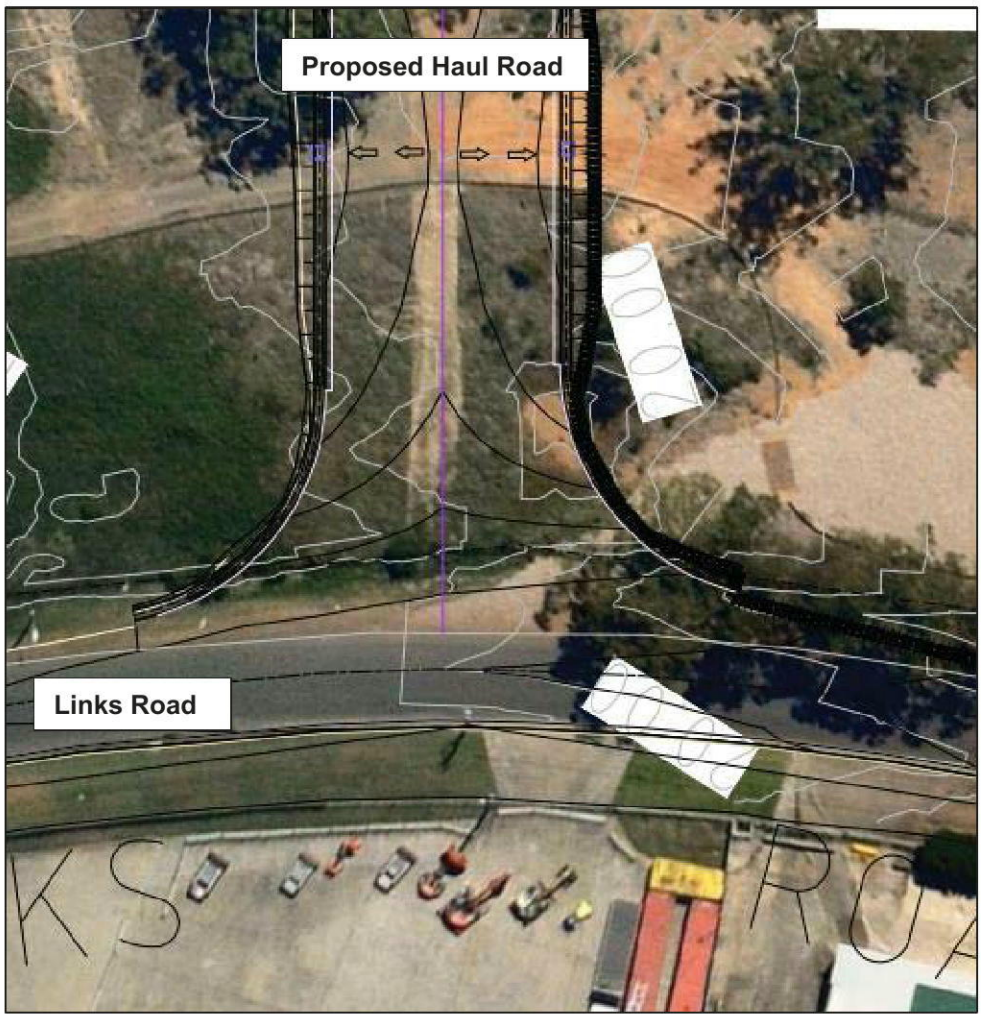
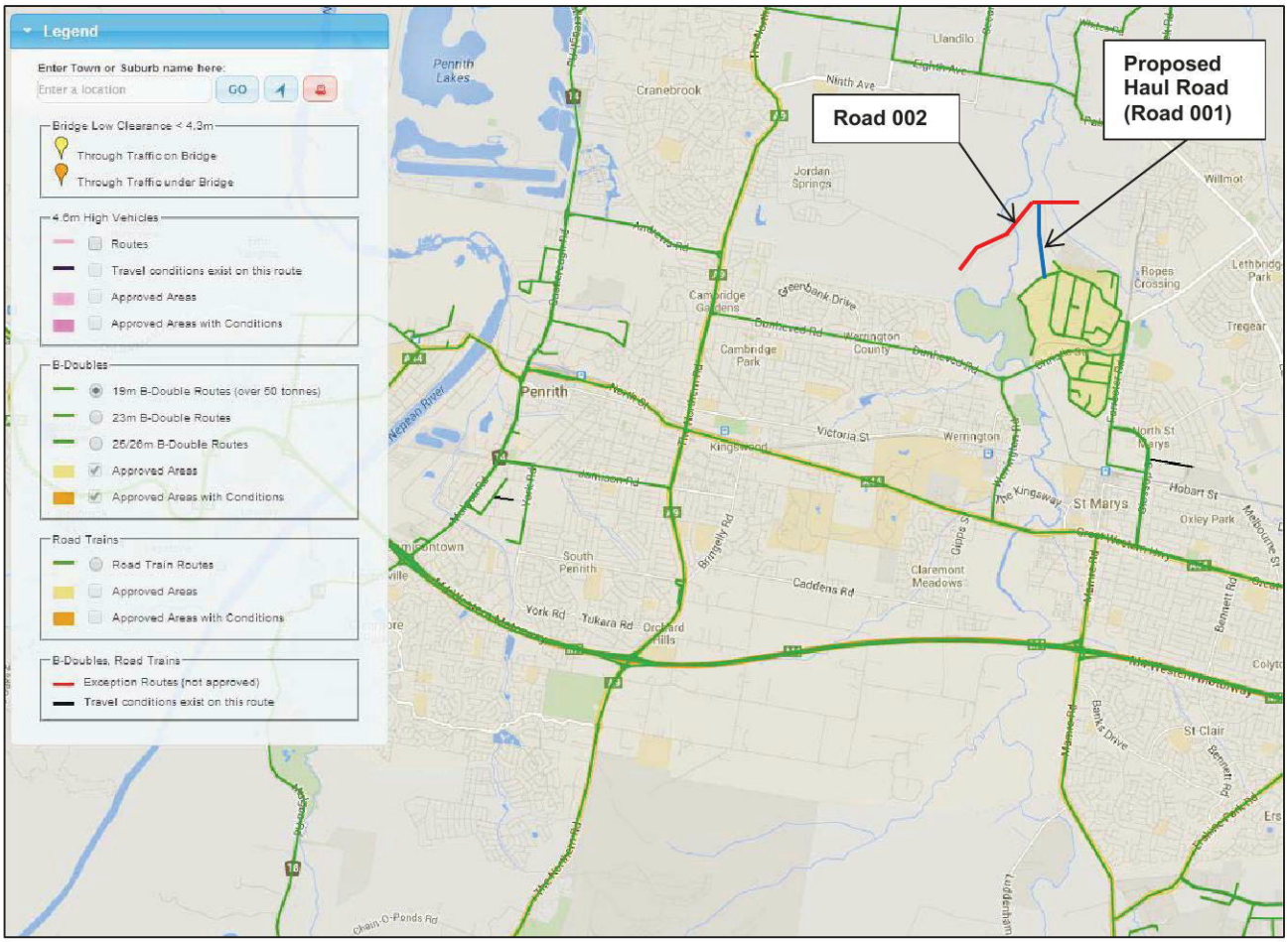



**Figure 2-2 Proposed Links Road/Haul Road Intersection**

### 2.2.9 Approved Routes for Heavy Vehicles – B-Doubles and High Clearance Vehicles

The NSW Roads and Maritime Services (RMS) have designated approved routes (or otherwise conditional routes) for B-Doubles (over 50 tonnes) and vehicles requiring bridge / underpass clearance greater than 4.6m. These designated routes are presented on **Figure 2-3** (in green colour).

There are generally no restrictions within the western/north-western region of Sydney, with major routes (such as Great Western Highway, Mamre Road, Glossop Street and Forrester Road) being available for use by B-Doubles and High Clearance Vehicles. As such, both B-Doubles and semi-trailers greater than 19m have unrestricted access to the site via these routes.




*Source: Roads and Maritime Services*

**Figure 2-3 Approved Routes for Heavy Vehicles (The RMS Designated 19m B-Doubles and High Clearance Vehicle Routes are Indicated in Green)**

# 3 Proposed Works

## 3.1 General

The current concept design of the haul road requires approximately 20,000 $m^3$ of fill to be imported and placed along the haul road alignment. No material is planned to be removed from the site.

The majority of truck movements will be associated with the importation of 20,000$m^3$ of fill material align the haul road alignment. There will also be some additional vehicle movements such as floating of mobile plant and maintenance vehicles. These movements are not expected to be significant.

The construction of the haul road is scheduled to commence in the final quarter of 2014 and construction will not be staged. The overall haul road construction project is anticipated to last between three to four months. However, the importation of fill material is expected to last only 6 weeks.

## 3.2 Construction Vehicles

The main type of construction vehicle that is anticipated to access the site is Truck & Dog trailers, which are 19 metres in length. In addition, some Heavy Rigid Vehicles (12.5 metre length) and Medium Rigid Vehicles (8.8 metre length) will be occasionally used to deliver supplies such as fuel/oils/site sheds to the site.

## 3.3 Proposed Hours of Operation

It is acknowledged that the proposed placement of fill material would occur over a period of six weeks. Approval is sought for 24 hours a day, 7 days a week operations for the works associated with the construction of the haul road.

## 3.4 Proposed Access and Internal Road Transport Measures

The contractor shall be responsible for the establishment of haulage routes within the site. Notwithstanding, the following generic guidelines are recommended:

> Only one access point will join Links Road with the haul road construction site. All construction vehicles will enter and exit the site at this one point;

> The internal roads shall be of sufficient width to accommodate two-way truck movements;

> A waiting and turning area designed to accommodate 19m Truck & Dog trailer vehicles shall be provided; and

> Vehicles remaining on site, including earth moving equipment, will be required to observe the internal speed restriction of 20km/h.

The access arrangement proposed for the site is a simple priority control arrangement off Links Road. The concept design of the proposed access is indicated in **Figure 2-2.**

## 3.5 Construction Vehicle Parking and Layover Areas

In the event that there are delays at the construction site and the works are unable to continue accepting construction vehicles, it is desirable to identify an area where heavy vehicles may park within the site. In fulfilling this, a vehicle standing area has been identified adjacent to the site entrance off Links Road and is presented in **Figure 3-1** below.

It is noted that the truck layover and parking area identified in **Figure 3-1** will be constructed as a hardstand area to accommodate both heavy construction vehicles and other light vehicles (used by the labour force) which may be present at the site.

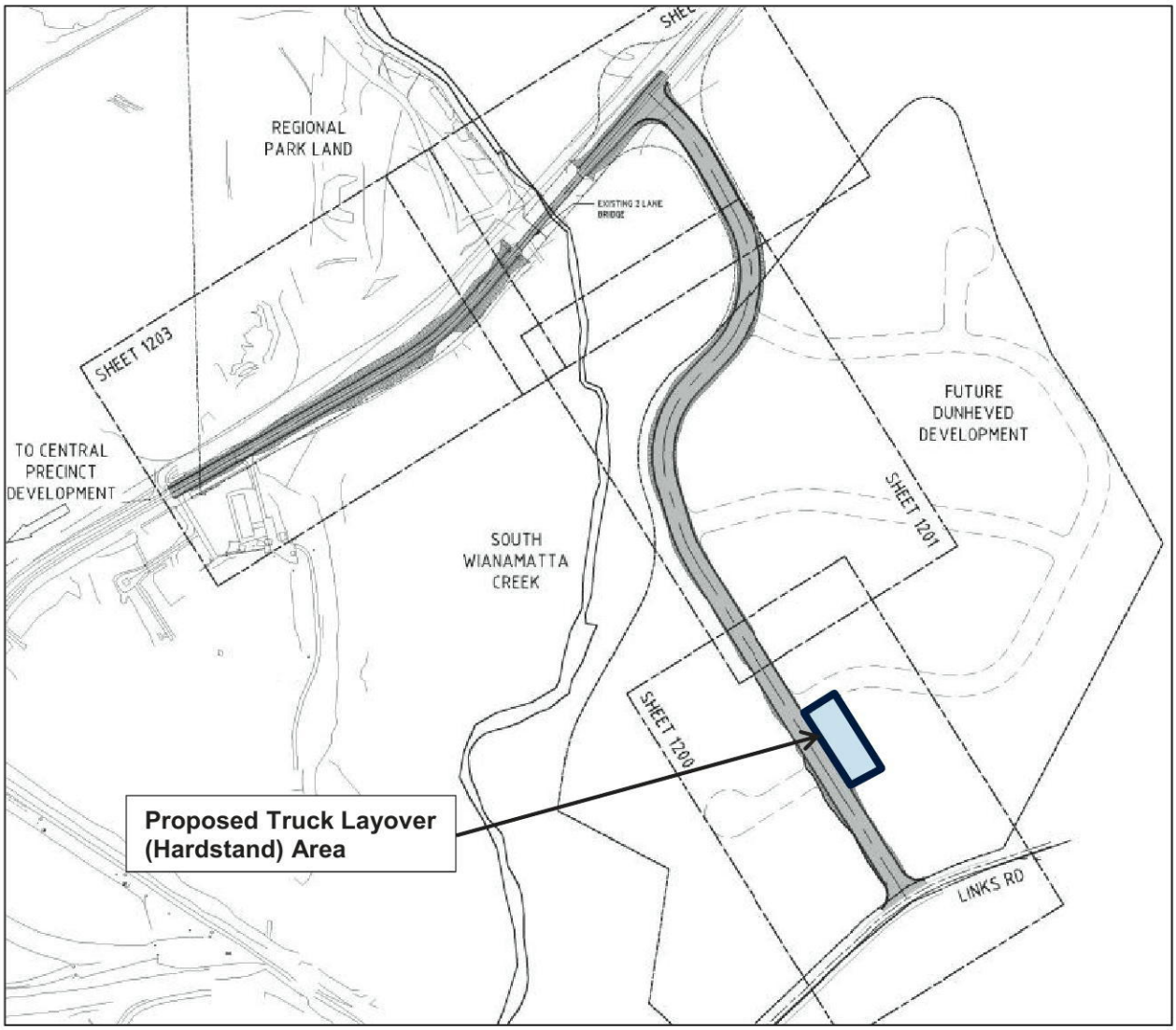



**Figure 3-1 Proposed Truck Layover Area**

# 4 Traffic Generation and Traffic Impact

## 4.1 Proposed Haulage Route

It is acknowledged that two potential sources of fill material are being considered for construction of the haul road. These sources are located within Badgerys Creek and Burwood. **Figure 4-1** below illustrates this proposed haulage route.

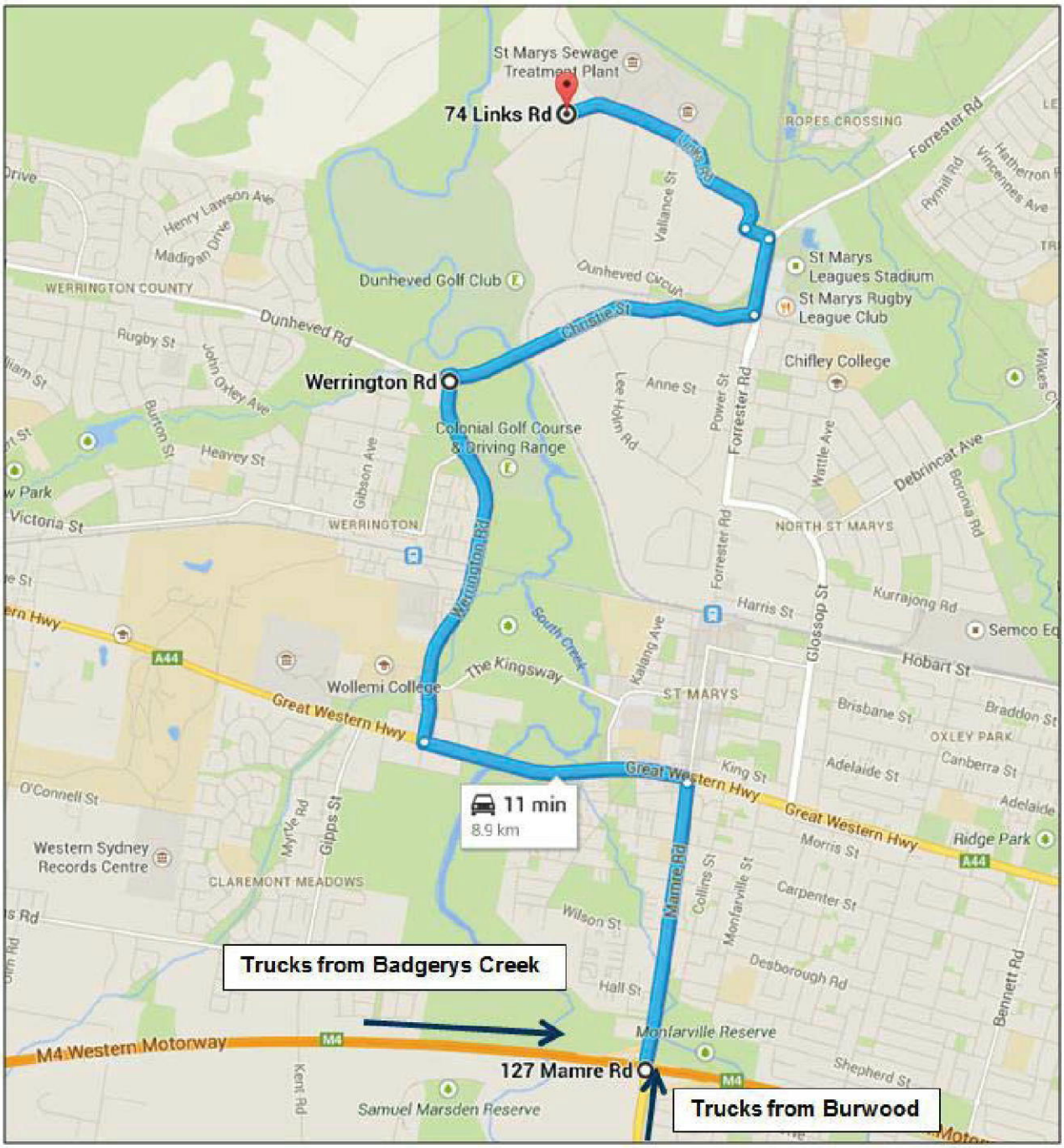



**Figure 4-1 Proposed Haulage Route for Importation of Fill Material**

As outlined in the figure above, the fill importation trucks will utilise the following route;

> Trucks from Badgerys Creek will drive along M4 Western Motorway and reach Mamre Road; and

> Trucks from Burwood will drive along Mamre Road.

From that point on, the trucks from both Badgerys Creek and Burwood will;

> Drive north along Mamre Road and turn left onto the Great Western Highway;

> Drive west on the Great Western Highway and turn right onto Werrington Road;

> Drive north on Werrington Road and turn right onto Christie Street;

> Drive east on Christie Street and turn left onto Forrester Road;

> Drive north on Forrester Road and turn left onto Links Road; and

> Drive west along Links Road and turn right (passed Dunheved Circuit) onto the haul road construction site.

It is noted that the haulage routes have been proposed to be consistent with the RMS designated B-Doubles routes (see **Figure 2-3**) in order to minimise any potential impacts. It is noted that although Mamre Road and Werrington Road run along residential areas. However, these roads are already designated as B-Double routes by RMS and the truck drivers shall follow the drviers code of conduct guidelines indicated in **Section 5** below.

## 4.2 Traffic Generation

The traffic generation associated with material importation and general operations were calculated using the conservative assumptions outlined in **Table 4-1** below. It is noted that the following table only considers the initial 6 week period during which fill materials will be imported to the subject site in order to construct the proposed haul road, as this is the most intensive period in terms of traffic generation, during the overall 3 to 4 months construction period of the haul road.

**Table 4-1 Traffic Generation Assumptions (initial 6 week period)**

| Item | Quantity | Comments |
|---|---|---|
| Fill importation period | 6 weeks | At this stage, the fill importation stage of the overall development is estimated to last up to 6 weeks. This period represents the worst case for traffic generation during the overall haul road construction period of 3 to 4 months. |
| Total number of working hours | 1,008 | Council approval is sought for 24 hours a day and 7 days a week fill importation. |
| Total fill imported to the site | 20,000 | Cubic metres |
| Capacity of each truck | 19 | Cubic metres. It is noted that a typical Truck and Dog trailer vehicle can carry up to 19 cubic metres of material. |
| Fill importation trucks entering the site over the span of 6 weeks | 1,053 | Into the site. |
| General operational (other than fill) trucks entering the site over the span of 6 weeks | 420 | Assumed Heavy/Medium Rigid Vehicle movements (other than fill importation) entering the site (10 Heavy vehicles per day during the 6 week fill importation period). |
| Total trucks entering the site over the span of 6 weeks | 1,473 | Both Truck & Dog trailers and other Heavy/Medium Rigid Vehicles. |
| Total truck movements over the span of 6 weeks | 2,946 | In and out of the site |
| Number of truck movements per day | 70 | In and out of the site |
| Number of truck movements per hour | 3 | In and out of the site (assumes even distribution of truck movements throughout the day) |

As outlined in the table above, it is evident that approximately 70 truck movements per day will be generated by the fill importation and general construction activities on the site during the fill importation period of the haul road construction. This equates to approximately 1 to 2 trucks entering and 1 to 2 trucks exiting the site in each hour (assuming a uniform distribution of vehicle movements over the fill importation period), every day of the week, during the 6 week fill importation period.

These low levels of truck movements per hour are attributable to the 24 hour/7 day operations. Due to this 24 hour work period, the truck movements are spread out uniformly across the 6 week construction period of the haul road. As such, these low levels of truck movements are not considered to have any material effect on the existing road network traffic operations.

It is also noted that due to the industrial nature of the areaserved by Links Road, it is anticipated that a large portion of the existing traffic volumes comprise of heavy vehicles. Also, the section of Links Road, located to the west of its intersection with Dunheved Circuit, serves a small portion of the overall industrial precinct and terminates at a dead end approximately 1.4km downstream (at Dunheved Golf Club) of the proposed haul road/Links Road intersection. As such, it is anticipated that this section of Links Road will have minimal existing traffic volumes. An additional 3 heavy vehicles (as determined in the table above) due to the proposed works is therefore unlikely to result in any adverse impacts to the existing traffic operations.

# 5 Drivers Code of Conduct

Management of vehicular access to and from the site is essential to maintain the safety of the general public as well as the labour force. The following code is recommended as a preliminary measure to maintain safety standards:

> Utilisation of only the designated transport routes;

> Haulage/Construction vehicle movements are to abide by the schedules agreed with the Council and RMS; and

> Site parking guidelines shall be developed by the contractor as part of the final Construction Traffic Management Plan to ensure that construction traffic parks only in appropriate and designated locations.

## 5.1 Noise Minimisation Controls

This section discusses the noise mitigation measures which should be adhered to as follows.

### 5.1.1 Compression Braking Noise

Compression braking can be extremely noisy and impacts on residential amenity. Compression braking should be minimised in residential areas (such as Werrington Road) and avoided completely in built up areas.

### 5.1.2 Speed

It is understood that the speed limit on Links Road is 60km/hr. As such, no reduction in speed limit is proposed along the stretch of Links Road that lies at the frontage of the proposed haul road access point.

## 5.2 Delivery Standards

Road delivery standards in relation to delivery to the site will be discussed in this section as follows. It is noted that the entirety of the proposed route travelled by haulage/operational vehicles are on arterial/B-Double approved routes.

### 5.2.1 Queuing

While no overflow is anticipated, vehicles arriving at the site are not permitted to park/queue on Links Road. Vehicles arriving at site prior to opening time should park within the designated parking areas.

### 5.2.2 Braking

Brakes are to be applied in a way that excessive noise (such as from compression braking) is avoided, so as not to negatively affect residential amenity.

### 5.2.3 Covering of Loads

All trucks delivering to the site are required to have an effective load covering.

### 5.2.4 Truck Wash

All trucks are to utilise the shake down/wash areas before leaving the site.

# 6 Mitigation of Traffic Impacts

The contractor will be required to prepare a Traffic Management Plan (TMP) prior to the commencement of works. Traffic will generally be managed at the site in the following way:

> Designated transport routes shall be communicated to all personnel; and

> Scheduling of vehicle movements should occur in order to minimise vehicles waiting off the site.

The following issues will be considered in more detail in the completed Traffic Management Plan:

> Traffic/Parking Impact; and

> Construction Traffic Management, Signage and Devices.

# 7 Links Road/Haul Road Intersection

This section will investigate the suitability of the proposed Links Road/haul road intersection location. As a part of this investigation, consideration has been given to the sight distance and signage requirements at the proposed Links Road/haul road intersection.

## 7.1 Sight Distance Assessment

It is understood that access to the haul road construction area will be obtained via the proposed future haul road/Links Road intersection. As such, the Safe Intersection Sight Distance (SISD) was assessed for the proposed intersection of haul road with Links Road based on the guidelines provided in Austroads Guidelines: Guide to Road Design Part 4A - Unsignalised and Signalised Intersections (2009).

The SISD determines the minimum distance which should be provided on a major road at any intersection and is dependent on a number of factors including the major road speed limit and type of vehicle travelling on the road.

The following figure outlines the formula used to obtain the SISD value for the subject intersection.

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

**Figure 7-1 The SISD Formula**

*Source: Austroads Guide to Road Design: Part 4A – Unsignalised and signalised Intersections*

The above formula was used to determine the SISD required for a heavy vehicle, which is exiting the haul road onto Links Road, to obtain safe sight distance during the night time (this represents the worst case scenario as 24 hour approval is sought for fill importation). In addition, the general minimum reaction time of 2 seconds was adopted for the drivers of the heavy vehicles.

The following table outlines the values used in the formula presented in **Figure 7-1** above, in order to determine the SISD for the subject intersection.

**Table 7-1 Values Used in SISD Calculation**

| Coefficient | Description | Value Used |
|---|---|---|
| $D_T$ | Decision Time (seconds) = Observation Time + Reaction Time | The Decision Time was established to be 5 seconds using an Observation Time of 3 seconds and a Reaction Time of 2 seconds. |
| V | Operating Speed (km/hr) | 60 km/hr – The posted speed limit on Links Road. |
| d | Coefficient of deceleration | 0.29 (as recommended in Table 3.2 in AustRoads Guide Part 4A) |
| a | Longitudinal Grade in % | 0% grade as the terrain is generally flat. |

Using the above values a SISD of 132.2 metres was calculated for the subject intersection. Investigation of the surrounding areas of the proposed haul road/Links Road intersection indicates that there is sufficient clearance to accommodate the 132.2 metre sight distance.

However, it should be noted that to ensure this sight triangle is clear of any permanent visual obstructions, the trees that are located to the east of the haul road (along the northern boundary of Links Road), should be cleared/trimmed.

The figure below outlines the SISD sight triangle which represents the area to be clear of any permanent visual obstructions so that a driver exiting the haul road onto Links Road can obtain sufficient sight distance at night time.

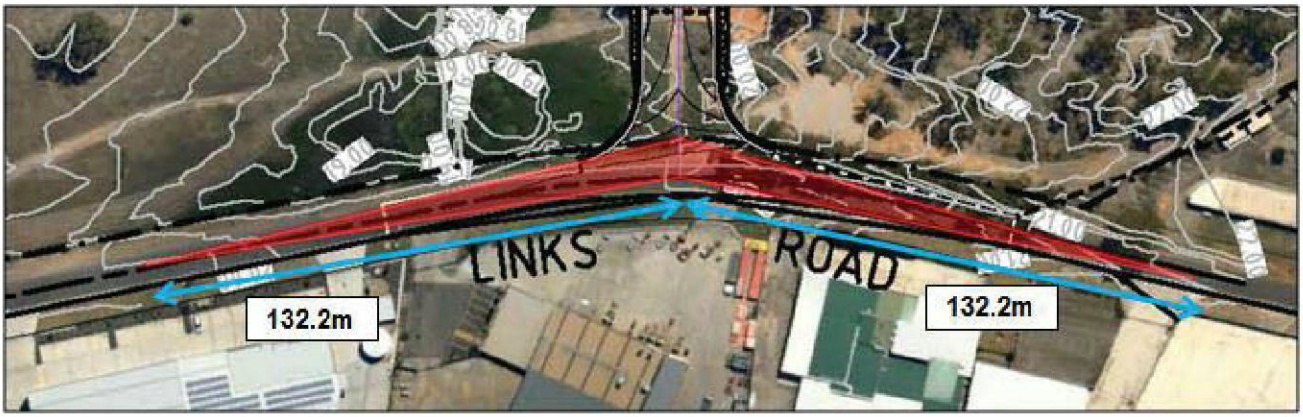



**Figure 7-2 Sight Triangle for Trucks Exiting the Haul Road**

## 7.2 Signage Requirements

Temporary works signage will be provided as required to warn traffic travelling in both directions on Links Road to the potential hazards associated with construction vehicles operating nearby.

The construction contractor should implement the necessary traffic control signage during works as per Australian Standard 1742.3 and in accordance with any requirements imposed by the highway authority. All traffic controls will be undertaken by the authorised traffic control service provider.

It is proposed that the “TRUCKS TURNING” sign, consisting of a truck warning symbol should be provided on Links Road on both approaches to the intersection with the proposed site access. Relevant signage, such as “TWO WAY”, “GIVE WAY” and Speed Limit signs are to be installed at the site access during the material importation and construction phases.

A reduction in speed limit is not considered necessary along the stretch of Links Road fronting the haul road access (during construction times) as Links Road currently includes a satisfactory posted speed limit of 60 km/hr. Due to the industrial nature of the overall precinct served by Links Road, it is anticipated that a large portion of the existing traffic volumes comprise of heavy vehicles. Also, the section of Links Road that lies to the west of its intersection with Dunheved Circuit serves a small portion of the overall industrial precinct and terminates at a dead end approximately 1.4km downstream (at Dunheved Golf Club) of the proposed haul road/Links Road intersection.

An indicative plan showing the signage requirements for the works are presented in **Figure 7-2** below. It is the requirement of the traffic control contractor commissioned during construction to implement the traffic control plans in accordance with AS1742. The plan below is indicative and should only be used for guidance purposes.

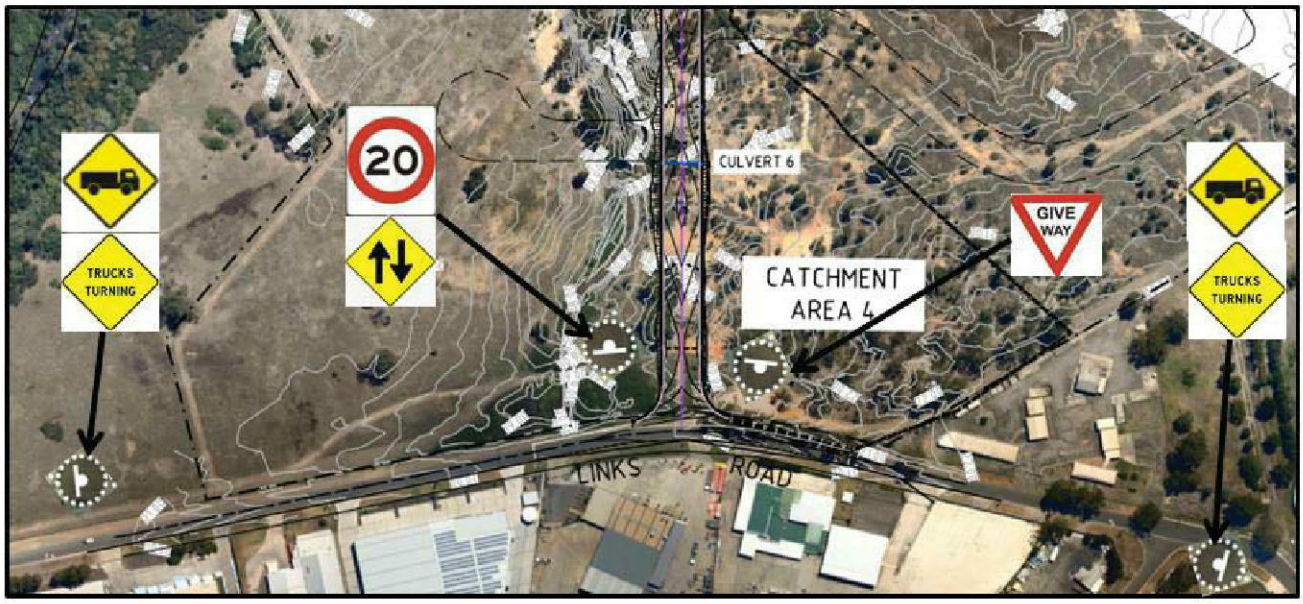



**Figure 7-3 Proposed Temporary Signage Plan (Indicative)**

# 8 Conclusion

This assessment considered the traffic impacts arising from the construction works and operations associated with the construction of a haul road joining Links Road to the Central Precinct.

The following findings can be concluded from this study;

- The haul road (Road 001) is located off Links Road, a few metres west of the Links Road / Dunheved Circuit intersection. This haul road will run approximately 1km northwest until it connects to Road 002;
- The haul road access from Links Road is located within an industrial precinct and therefore is considered consistent in some degree to the heavy vehicle movements within the area;
- Construction vehicle access to the haul road construction site is provided directly off Links Road. This access location will be the future Links Road/haul road intersection;
- Haulage traffic routes shall be restricted as much as practically possible to the main arterial road network and approved B-Double road network in order to minimise any detrimental impact on the surrounding road network and the local amenity for residents;
- The proposed haulage route for delivery of fill importation is contained within the RMS designated heavy vehicle routes for all road sections starting from M4 Western Motorway and Mamre Road up to Links Road;
- Layover area is proposed to be provided on-site, on a hard stand area adjacent to the proposed haul road, to accommodate construction vehicles and the parking requirements of labour force;
- From the findings presented in the traffic impact section of this report, it is anticipated that approximately 70 truck movements will be generated by the fill importation and general construction activities on the site each day, during the fill importation stage of the haul road construction. Assuming a uniform distribution of truck movements, this equates to approximately 1 to 2 trucks entering and 1 to 2 trucks exiting the site in each hour, every day of the week, during the initial 6 week fill importation period;
- As such, traffic impacts during the fill importation stages of construction and operation will be minimal and are unlikely to generate adverse impacts on the existing traffic operations;
- Given that all road sections of the haulage route of fill material are consistent with the RMS designated heavy vehicle roads, all movements by the largest anticipated vehicle (19m long Truck and Dog trailer) can be sufficiently accommodated within the constraints of the key intersections;
- The access arrangement proposed for the haul road is a simple priority controlled arrangement off Links Road;
- The Safe Intersection Sight Distance assessment undertaken at the haul road access location from Links Road reveals sufficient sight distance for a truck driver who is exiting the Haulage Road onto Links Road at night time. However, it is advised to clear/trim the trees that are present along the northern boundary of Links Road (to the east of haul road), in order to ensure that the sight triangle for the driver is kept clear of permanent visual obstructions;
- Links Road currently includes a 60 km/hr posted speed limit. Due to the industrial nature of the overall precinct served by Links Road, it is anticipated that a large portion of the existing traffic volumes comprise of heavy vehicles. Also, the section of Links Road, located to the west of its intersection with Dunheved Circuit, serves a small portion of the overall industrial precinct and terminates at a dead end approximately 1.4km downstream of the proposed haul road/Links Road intersection. As such, a reduction in speed limit during construction times is not deemed necessary; and

- Temporary works signage shall be provided as required to warn traffic travelling in both directions of Links Road to the potential hazards associated with the proposed construction activities. An indicative plan showing the signage requirements during the period of construction works has been provided within this report.