

# ROADWORKS

## TRAFFIC MANAGEMENT PLAN (EXAMPLE)

### INTERSECTION WORKS

SOUTH STREET O'CONNOR

ABC Contractors Pty Ltd

MRWA Contract 123/14

April 2017

#### Declaration

I, A Designer (AWTM Cert No.000) declare that I have designed this Traffic Management Plan following a site inspection on 01/04/2017. The Traffic Management Plan prepared, **subject to the variations approved**, is in accordance with the Main Roads Code of Practice and AS 1742.3

Signature: .....

Date: XX/XX/XX

	Name / Company	Accreditation Details	Date	Signed
TMP designed by	A Designer	AWTM 000	01/04/2017	
RTM reviewed and Approved by	R Tem	RTM 001	06/04/2017	
Compliance Audit to be undertaken by:	A Checker	RTM 002	08/04/2017	
Service Authority Approval	N/A	N/A		
Road Authority Approval	Road authority approval to implement regulatory traffic signs is given for Traffic Management Plan No. XXX-XXXXX			
	Signed	Authorised Officer		Date
	(Print Name)	Position		

TMP No TSPL- XXX-XXXXX	Rev. No. X	Date XX/XX/XX
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### GLOSSARY

AS	Australian Standard
AS/NZS	Australian and New Zealand Standard
AWTM	Advanced Worksite Traffic Management / Manager
CoP	Traffic Management for Works on Roads Code of Practice (MRWA)
MRWA	Main Roads Western Australia
OS&H	Occupational Safety and Health
RTM	Roadworks Traffic Manager (accredited by MRWA)
SRSA	Senior Road Safety Auditor
TCD	Traffic Control Diagram
TMP	Traffic Management Plan

## 1 Introduction

### 1.1 Purpose and Scope

This Traffic Management Plan (TMP) outlines the traffic control and traffic management procedures to be implemented by the Project Manager and Project Contractors to manage potential hazards associated with the traffic environment during the project.

### 1.2 Objectives and Strategies

The objectives of the Traffic Management Plan are:

- To provide protection to workers and the general public from traffic hazards that may arise as a result of the construction activity.
- To manage potential adverse impacts on traffic flows to ensure network performance is maintained at an acceptable level.
- To minimise adverse impacts on users of the road reserve and adjacent properties and facilities.

In an effort to meet these objectives the Traffic Management Plan will incorporate the following strategies;

- Providing a sufficient number of traffic lanes to accommodate vehicle volumes.
- Ensuring delays are minimised.
- Ensuring all road users are managed including motorists, pedestrians, cyclists, people with disabilities and people using public transport.
- Ensuring work activities are carried out sequentially to minimise adverse impacts.
- Provision will be made for works personnel to enter the work area in a safe manner in accordance with safety procedures.
- All entry and exit movements to and from traffic streams shall be in accordance with the requirements of safe working practices.

## 2 Project Overview

### 2.1 Location.

The project site is located in O'Connor as shown in Figure 1.0 below.

# TRAFFIC MANAGEMENT PLAN

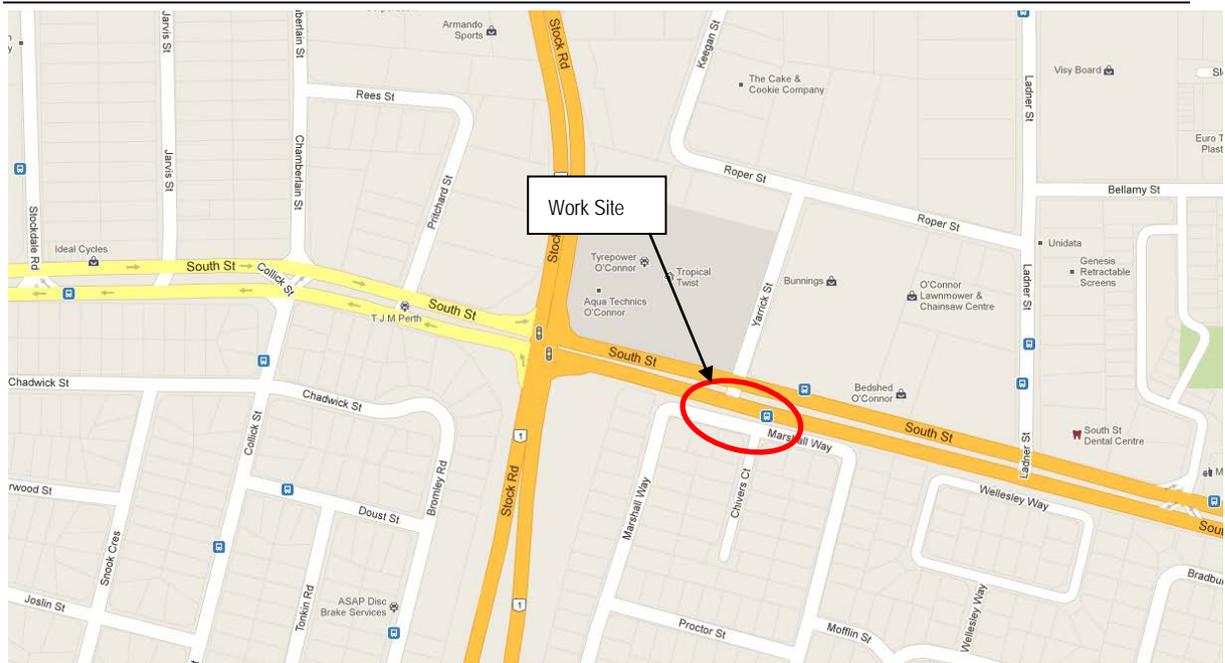


Figure 1 Site Location

## 2.2 Project Details and Site Constraints/Impacts

ITEM	DESCRIPTION
Project	<p>The project involves modifications to the road carriageway geometry and median islands at the South Street – Yarrick Street intersection including:</p> <ul style="list-style-type: none"> <li>• Reconstruction and widening of the intersection;</li> <li>• Construction of new bus bays;</li> <li>• Installation of new drainage modules.</li> </ul>
Classification	<p>South Street is classified as a Primary Distributor road under the MRWA Functional Road Hierarchy.</p> <p>The works proposed classify the traffic management as “complex”</p>
Road Authority	Main Roads WA.
Local Government	City of Melville.
Client	ABC Contractors.
Prime Contractor	ABC Contractors.
Sub-Contractor	XYZ Contracting.

## TRAFFIC MANAGEMENT PLAN

ITEM	DESCRIPTION
Scope of Works	<ul style="list-style-type: none"> <li>• Reconstruction and widening of the intersection;</li> <li>• Construction of new bus bays;</li> <li>• Installation of new drainage modules.</li> </ul>
Staging of Work	<p>The works will be carried out in 5 main stages and are intended to be undertaken at suitable times when traffic volumes can be accommodated within the available traffic lanes or within the periods provided for by Main Roads WA.</p> <p>Works on the intersection modifications will be undertaken under manned traffic control and will operate between the hours prescribed in the TMP.</p> <p>A temporary 40km/h speed zone will be implemented during work shift hours on the approaches to and past the work site</p> <p>If necessary, accredited traffic controllers will be used to stop traffic to allow for the manoeuvring of plant and equipment or when it is necessary for work personnel to move within 1.2m of a lane closure.</p> <p>When traffic controllers are used, the Contractor shall ensure that all required signage has been installed, traffic controllers follow correct procedures and are stationed on the road edge / traffic island clear of through traffic.</p>
Project Date	The modification works are expected to be undertaken over a 16 week period during April, May, June and July in 2017.
Hours / Days of Work	<p>Works will take place from Monday to Friday. Suitable working times when traffic volumes can be accommodated within available traffic lanes are as follows:</p> <p>Stage 1: 6 PM to 7 AM</p> <p>Stage 2: 7 PM to 7 AM</p> <p>Stage 3: 7 AM to 5 PM</p> <p>Stage 4: 6 PM to 7 AM</p> <p>Stage 5: 7 PM to 10 AM</p>
Duration of Work	16 weeks.

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ITEM	DESCRIPTION
Other Constraints	<p>South Street is a Primary Distributor and as such is an important network road that carries regional traffic and up to 7.2 % commercial traffic. Yarrick Street is designated as an Access road (giving access to a number of shops including Bunnings) and as such is expected to carry low to moderate volumes of local traffic. The intersection of South Street and Yarrick Street is currently a tee intersection controlled by a give way sign.</p> <p>Due to the existing traffic environment it will be necessary to impose a number of site constraints. These constraints will include:</p> <ul style="list-style-type: none"> <li>• Implementing lane closures on South Street where required.</li> <li>• Closing portion of Yarrick Street and detouring traffic from Yarrick Street.</li> <li>• Imposing a 40km/h speed zone on the approaches to and past the work site.</li> <li>• Ensuring the anticipated traffic volumes can be accommodated within the available traffic lanes while undertaking the works or confining working hours to the periods prescribed by Main Roads WA.</li> </ul> <p>The proposed work will be carried out in 5 main stages to minimise adverse impact on the current traffic environment. Each stage will be implemented upon the completion of the previous stage.</p> <p>The traffic control layout for the worksite location is detailed in the Traffic Control Diagrams (TCD's) included in this Traffic Management Plan.</p>
Concurrent/adjacent Works or Projects	No concurrent works are planned.

### 3 Project Representatives

Road Authority	Main Roads WA.
Road Authority Representative	S Guy 0400 000 001
Local Government	City of Melville
Contact	A Manager 1300 635 845
Client	ABC Contractor.
Contact	A Contractor 0004 000 000

## TRAFFIC MANAGEMENT PLAN

Prime Contractor	ABC Contractor.
Project Manager / Site Contact	P Manager 0004 000 700
Sub Contractor	Contact prime Contractor.
Supervisor / Site Contact	S Supervisor 0004 000 700

### 4 Traffic Management Administration

TMP Design	TMP Design Company
Contact Details	A Designer 0004 222 2222.
Traffic Management by	TMP Control Company
Site Contact	T Controller 0004 111 111.

### 5 Safety Plan

#### 5.1 Occupational Safety and Health

All persons and organisations undertaking these works or using the roadwork site have a duty of care under statute and common law to themselves, their employees and all site users, lawfully using the site, to take all reasonable measures to prevent accident or injury.

This TMP forms part of the overall project Safety Management Plan, and provides details on how all road users considered likely to pass through, past, or around the worksite will be safely and efficiently managed for the full duration of the site occupancy and works.

All traffic management works and control devices shall be in accordance with

- AS 1742 – Manual of uniform traffic control devices
  - Part 1 – General introduction and index of signs
  - Part 2 – Traffic control for general use
  - Part 3 – Traffic control for works on roads
  - Part 4 – Speed controls
- AS/NZS ISO 31000– Risk Management – Principles and Guidelines
- AS/NZS 4602– High visibility safety garments
- Disability Services Act
- Guide to Preparation of Traffic Management Plans

- Local Government Act
- Main Roads Act
- MRWA Specification 202
- Occupational Safety & Health Act
- Occupational Safety & Health Regulations
- Road Traffic Act
- Road Traffic Code
- Traffic Controllers' Handbook
- Traffic Management at Roadworks on State Roads, Policy and Application Guidelines
- Traffic Management for Events Code of Practice
- Traffic Management for Works on Roads Code of Practice
- Traffic Management Plan Preparation Guidelines
- Truck and Trailer Mounted Attenuator National Guidelines

### 5.2 Competencies

ABC Contractors (the Contractor) have engaged TMP Design Company to prepare this Traffic Management Plan and associated controls for the works.

The Contractor will ensure that at all times during working hours a supervisory person will be available who is accredited in "Basic Worksite Traffic Management" as well as ensuring that traffic controllers used on the project are experienced in high traffic volume situations and have completed the recommended accredited courses in traffic control.

### 5.3 Responsibilities

The Project Manager has the ultimate responsibility to ensure the TMP is implemented for the prevention of injury and property damage to employees, contractors, sub-contractors, road users and all members of the public.

The Project manager will ensure all site personnel are fully aware of their responsibilities, and that traffic controllers are appropriately trained and accredited and that sufficient controllers are available to ensure appropriate breaks are taken.

All personnel engaged in the field activities will follow the correct work practices as required by AS1742.3.

All personnel will not commence or continue work until all signs, devices and barricades are in place and operational in accordance with the requirements of the TMP.

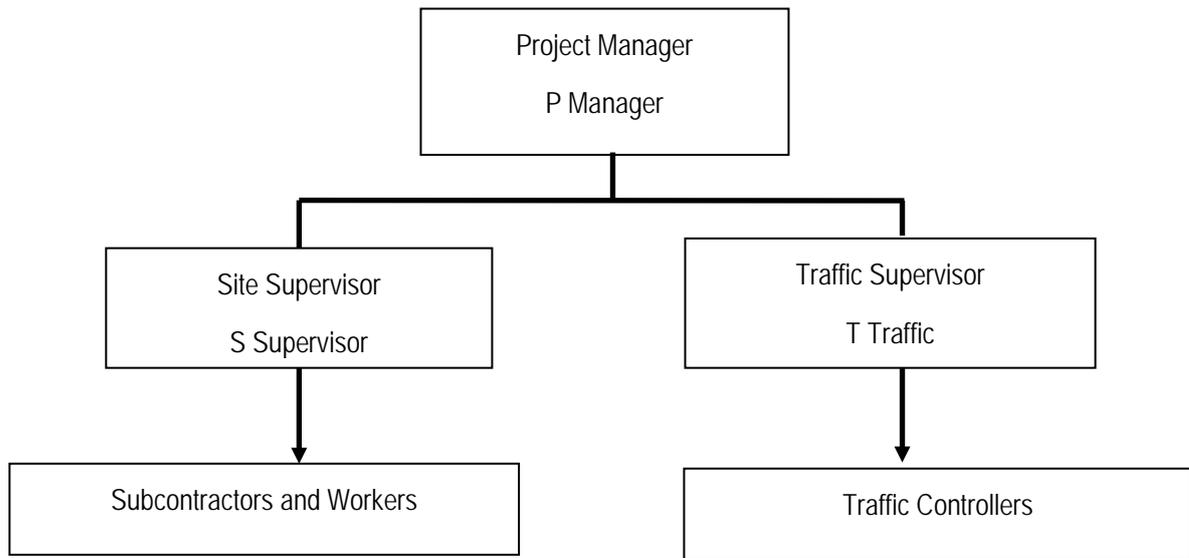
All personnel responsible for traffic control shall ensure that the number, type and location of signs, devices and barricades are to a standard not less than Appendix F of this plan and AS1742.3 (except where

specifically detailed in this TMP with reasons for the variations). Should a situation arise that is not covered by this TMP or AS1742.3, the Road Authority Representative shall be notified.

The Road Authority Representative may direct erection, relocation or removal of signs or devices, which, in the opinion of the Road Authority Representative, are not in accordance with the TMP and do not provide sufficient safety for road users. If such directions are not complied with, the Road Authority Representative may arrange for erection, relocation or removal by others at the cost of the Contractor.

#### 5.4 Specific Responsibilities.

The following diagram outlines the responsibility hierarchy of this contact.



##### 5.4.1 Project Manager

The project manager shall:

- Ensure all traffic control measures of this TMP are placed and maintained in accordance with this plan and the relevant Acts, Codes, Standards and Guidelines
- Ensure suitable communication and consultation with the affected stakeholders is maintained at all times
- Ensure inspections of the Traffic Controls are undertaken in accordance with the TMP, and results recorded. Any variations shall be detailed together with reasons
- Review feedback from field inspections, worksite personnel and members of the public, and take action to amend the traffic control measures as appropriate following approval from the Road Authority's Representative
- Arrange and/or undertake any necessary audits and incident investigations

### 5.4.2 Site Supervisor

The site supervisor is responsible for overseeing the day-to-day activities, and is therefore responsible for the practical application of the TMP, and shall:

- Instruct workers on the relevant safety standards, including the correct wearing of high visibility safety vests
- Ensure traffic control measures are implemented and maintained in accordance with the TMP
- Undertake and submit the required inspection and evaluation reports to management
- Render assistance to road users and stakeholders when incidences arising out of the works affect the network performance or the safety of road users and workers
- Take appropriate action to correct unsafe conditions, including any necessary modifications to the TMP.

### 5.4.3 Traffic Management Personnel

- The Traffic Management Company responsible for the implementation of the traffic management shall be registered on the State Road Traffic Management Company Registration Scheme.
- At least one person on site shall be accredited in Basic Worksite Traffic Management, and shall have the responsibility of ensuring the traffic management devices are set out in accordance with the TMP
- At least one person accredited in Advanced Worksite Traffic Management shall be available to attend the site at short notice at all times to manage variations, contingencies and emergencies, and to take overall responsibility for traffic management.

### 5.4.4 Traffic Controllers

Traffic Controllers shall be used to control road users to avoid conflict with plant, workers, traffic and pedestrians, and to stop and direct traffic in emergency situations.

Traffic Controllers shall:

- Work for a company registered on the State Road Traffic Management Company Registration Scheme.
- Operate in accordance with Section 4.10 and Appendix C of AS1742.3 and Main Roads WA Traffic Controllers' Handbook.
- Be accredited in Basic Worksite Traffic Management
- Hold a current Traffic Controller's accreditation
- Take appropriate breaks as required by AS1742.3 and/or OS&H Regulations.

### 5.4.5 Workers and Subcontractors

Workers and Subcontractors shall

- Correctly wear high visibility vests, in addition to other protective equipment required (e.g. footwear, eye protection, helmet sun protection etc.), at all times whilst on the worksite
- Comply with the requirements of the TMP and ensure no activity is undertaken that will endanger the safety of other workers or the general public
- Enter and leave the site by approved routes and in accordance with safe work practices

### 5.5 Personal Protective Equipment

All personnel entering the work site shall correctly wear high visibility vests to AS/NZS 4602, in addition to other protective equipment required on a site-by-site basis (e.g. protective footwear, eye protection, helmet, sun protection, respiratory devices etc.) at all times whilst on the worksite.

### 5.6 Plant and Equipment

All plant and equipment at the workplace shall meet statutory requirements and have the required registration, licences or certification where required. All mobile equipment shall be fitted with suitable reversing alarms. All mobile plant and vehicles shall be fitted with a pair of rotating flashing yellow lamps in accordance with AS1742.3 clause 3.12.1. All workers will be made aware of the safe work practice at the time of the site induction.

### 5.7 Incident/Accident Procedures

In the event of an incident or accident, whether or not involving traffic or road users, all work shall cease and traffic shall be stopped as necessary to avoid further deterioration of the situation. First Aid shall be administered as necessary, and medical assistance shall be called for if required. For life threatening injuries an ambulance shall be called on telephone number 000. The Police shall also be called on 000 for traffic crashes where life threatening injuries are apparent. Any traffic crash resulting in non-life threatening injury shall immediately be reported to the WA Police Service on 131 444.

Broken down vehicles and vehicles involved in minor non-injury crashes shall be temporarily moved to the verge as soon as possible after details of the crash locations have been gathered and noted. Where necessary to maintain traffic flow, vehicles shall be temporarily moved into the closed section of the work area behind the cones, providing there is no risk to vehicles and their occupants or workers. Suitable recovery systems shall be used to facilitate prompt removal of broken down or crashed vehicles. Assistance shall be rendered to ensure the impact of the incident on the network is minimised.

Details of all incidents and accidents shall be reported to the Site Supervisor and Project Manager using the incident report form at Appendix "D" (or similar).

### 5.8 Trip Hazards

The worksite and its immediate surroundings shall be suitably protected and free of hazards, which could result in tripping by non-motorised road users. Hazards, which cannot be removed, shall be suitably protected

to prevent injury to road users, including those with sight impairment. Where level differences are significant, suitable barriers, which preclude pedestrian access shall be used.

Where works extend beyond daylight hours and adjacent lighting is insufficient to illuminate hazards to non-motorised road users, appropriate temporary lighting shall be installed.

The worksite shall be kept tidy to reduce the risk to workers.

### 5.9 Provision to Address Environmental Conditions

#### 5.9.1 Weather

Weather is not expected to adversely impact on the effectiveness of the traffic control detailed on the attached TCD's. Notwithstanding this, should adverse weather conditions be encountered during the works, the following contingency plans shall be activated.

##### 5.9.1.1 Rain

In the event of rain, an on-site assessment shall be made and sign spacing and tapers may be extended by 25% to account for increased stopping distances. "Slippery When Wet" signs may be placed as required and all changes shall be recorded in the daily diary.

Where rain occurs, Traffic Controllers shall audit the site and where signage and / or devices are not clearly visible, Traffic Controllers shall adjust signage to improve visibility or if necessary provide additional signage and delineation. Where stopping distances are adversely affected by wet surfaces, Traffic Controllers shall adjust spacing between signs to provide increased reaction time for drivers. All changes shall be noted in the daily diary.

##### 5.9.1.2 Floods

Should works be affected by flooding to the extent that the worksite becomes impassable or risk is considered unacceptable, all work shall cease immediately and Traffic Controllers (and other personnel if necessary) shall be deployed immediately to close the site and direct traffic around the flooded area. Emergency services and the Road Authority shall be notified immediately and Traffic Controllers shall remain onsite until emergency services and the Road Authority personnel arrive and take control of the site.

##### 5.9.1.3 Sun Glare

Where sun glare is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, Traffic Controllers shall adjust sign locations and provide additional delineation and traffic control devices necessary to address the risk from glare. Additionally, in the event that traffic control is adversely affected by glare at sunset and sunrise, traffic controllers will assist in maintaining low traffic speeds.

All changes are to be noted in the daily diary.

### 5.9.1.4 Fog/Dust/Smoke

Where fog, dust or smoke is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, Traffic Controllers shall adjust sign locations and provide additional delineation and traffic control devices necessary to address the risk from glare. All changes are to be noted in the daily diary.

Should works be affected by fog, dust or smoke to the extent that risk is considered unacceptable, all work shall cease immediately and Traffic Controllers (and other personnel if necessary) shall be deployed immediately to close the site. Emergency services and the Road Authority shall be notified immediately and Traffic Controllers shall remain onsite until emergency services and the Road Authority personnel arrive and take control of the site.

### 5.9.2 Terrain

There are no identified impacts associated with the terrain of the site. Notwithstanding this, should the initial set out inspection indicate adverse impacts associated with the terrain, traffic control should be modified to address identified issues and changes noted in the daily diary.

### 5.9.3 Vegetation

There are no identified impacts associated with vegetation at the site. Notwithstanding this, should the initial set out inspection indicate adverse impacts associated with vegetation, traffic control shall be modified to address identified issues and changes noted in the daily diary.

### 5.9.4 Existing Traffic and Advertising Signage

There are no identified impacts associated with existing traffic signage; where existing traffic signage is located within the traffic control zone, and is contrary to the temporary traffic control the signs shall be covered.

There are no identified impacts associated with advertising signage. Notwithstanding this, should the initial set out inspection and the night inspection indicate adverse impacts associated with advertising signage, traffic control shall be modified and changes noted in the daily diary.

### 5.9.5 Structures

There are no identified impacts associated with structures. Notwithstanding this, should the initial set out inspection and the night inspection indicate adverse impacts associated with structures, traffic control shall be modified and changes noted in the daily diary.

## 5.10 Worksite Access

### 5.10.1 Pedestrian access (including Facilities for the disabled)

There is no specific facility or service nearby that would increase normal use of the road facilities by people with disabilities and other vulnerable road users.

There are no schools in the vicinity of the worksite, and no significant numbers of children are expected.

Existing pedestrian facilities along South Street will only be affected during Stage 1 and Stage 4 of the works and are detailed in drawings MRWA-012 and MRWA-0123. Pedestrian crossing at Yarrick Street and across South Street from Yarrick Street will be affected and the following arrangements will be made.

- At Yarrick Street, temporary hardstand will be provided to enable safe crossing of Yarrick Street – appropriate signage will be installed for pedestrian guidance and warning.
- A temporary crossing shall be provided across South Street east of Yarrick Street and signed accordingly.
- Should pedestrians approach the site during working hours traffic controllers shall assist them past the worksite.

### 5.10.2 Cyclists

Where necessary, traffic controllers will direct and assist cyclists through the worksite during the works as detailed on the Traffic Control Diagrams. All temporary pathways shall be maintained at all times and left hazard free for after-hours use.

### 5.10.3 Site Access for Works Vehicles

Construction vehicles entering and exiting the traffic stream shall be mindful of the conditions that may affect the safety of these movements.

All entry and exit movements will be in accordance with the Road Traffic Code and shall be undertaken in the following manner:

Access points shall be notified to work personnel and suppliers.

Vehicles shall:

- Decelerate slowly and signal their intention by indicator to leave the traffic stream;
- Activate the vehicle's rotating yellow lamp, where fitted, once a speed of 20 km/h. has been reached and at least 50m prior to the exit location.
- Switch on the vehicle hazard lights once the vehicle is stationary.
- Where risks associated with unassisted exit or entry to or from the traffic stream are high, Traffic Controllers should be used to assist entry and exit movements.

Vehicles fitted with rotating amber lamps shall have the vehicle's rotating lamp activated prior to entering the traffic stream and shall undertake the following.

- Switch off the vehicle hazard lights;
- Indicate intention to enter the traffic stream using direction indicators;
- Ensure there is a suitable gap from oncoming traffic to allow for a safe entry manoeuvre; and,

- Turn off the rotating yellow lamp(s) once a speed of 40 km/h is reached.

Entry and exit manoeuvres shall be avoided in close proximity to intersections. Work personnel shall not cross traffic streams on foot unless absolutely necessary.

### **5.10.4 Emergency Vehicle Access.**

At all times when employees are on site, the Site Supervisor will take whatever action is practicable to assist emergency vehicles, tow trucks and/or service vehicles to gain access to crash or vehicle breakdown sites which are causing, or have the potential to cause an obstruction to traffic flow or imperil the safety of road users.

### **5.10.5 Public Transport.**

Public transport will be affected by the works. Whilst bus bay works are being undertaken, temporary relocated stops will be provided. The Public Transport Authority will be notified and requested to place appropriate signage at closed stops and install temporary stops and associated signage at relocated stopping points.

### **5.10.6 Access to Adjoining Development/Properties**

Where access to properties is impacted by the proposed works or the associated traffic control systems arrangements will be made to maintain property access where ever practicable to do so. Property owners or occupiers adjacent to the work site will be advised of the works via advance written notification informing them of the works, the likely duration and the possible impact on property access.

### **5.10.7 Existing Parking Facilities**

There is no on street parking on South Street however access to shops past the worksite to the north of South St must be kept open. A detour will be in place when closing the South Street and Yarrick Street intersection to give access to the shops on Yarrick Street.

### **5.10.8 Special Events and Other Works.**

Assessment confirms that there are no Special events planned during the project or other works expected in the vicinity of the construction site. As such, no impacts are expected.

### **5.10.9 School Crossings.**

There are no school crossings in the vicinity of the worksite.

### **5.10.10 Impact on Adjoining Road Network**

It is anticipated that traffic congestion will occur when only one traffic lane eastbound is in operation. A Variable Message Sign (VMS) will be erected in advance of the preceding intersection to alert motorists to the possible delays and to select an alternate route.

5.10.11 Heavy and Oversize Vehicles and Loads

South Street and Yarrick Street are both RAV permit category 4 roads, with vehicles up to 27.5 m long and a mass up to 87.5 tonnes permitted.

## 6 Hazard Identification Risk Assessment and Legal Requirements.

The following details the preliminary assessment of site hazards likely to be encountered, the level of risk associated with each and the control proposed. Note that the risk level is the level of assessed risk *without* the controls in place. The controls listed have been determined as being appropriate in reducing the risk to a level that is acceptable.

### 6.1 Risk Classification Tables

#### QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT

Level	Consequence	Description
1	Insignificant	Mid-block hourly traffic flow per lane is equal to or less than the allowable lane capacity detailed in AS1742.3. No impact to the performance of the network. Affected intersection leg operates at a Level of Service (LoS) of A or B. No property damage.
2	Minor	Mid-block hourly traffic flow per lane is greater than the allowable road capacity and less than 110% of the allowable road capacity as detailed in AS1742.3. Minor impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of C. Minor property damage.
3	Moderate	Midblock hourly traffic flow per lane is equal to and greater than 110% and less than 135% of allowable road capacity as detailed in AS1742.3. Moderate impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of D. Moderate property damage.
4	Major	Midblock hourly traffic flow per lane is equal to and greater than 135% and less than 170% of allowable road capacity as detailed in AS1742.3. Major impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of E. Major property damage.
5	Catastrophic	Midblock hourly traffic flow per lane is equal to and greater than 170% of allowable road capacity as detailed in AS1742.3. Unacceptable impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of F. Total property damage.

**OSH QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT**

Level	Consequence	Description
1	Insignificant	No treatment required
2	Minor	First aid treatment required.
3	Moderate	Medical treatment required or Lost Time Injury
4	Major	Single fatality or major injuries or severe permanent disablement
5	Catastrophic	Multiple fatalities.

**QUALITATIVE MEASURES OF LIKELIHOOD**

Level	Likelihood	Description
A	Almost certain	The event or hazard: is expected to occur in most circumstances, will probably occur with a frequency in excess of 10 times per year.
B	Likely	The event or hazard: Will probably occur in most circumstances, will probably occur with a frequency of between 1 and 10 times per year.
C	Possible	The event or hazard: might occur at some time, will probably occur with a frequency of 0.1 to 1 times per year (i.e. once in 1 to 10 years).
D	Unlikely	The event or hazard: could occur at some time, will probably occur with a frequency of 0.02 to 0.1 times per year (i.e. once in 10 to 50 years).
E	Rare	The event or hazard: may occur only in exceptional circumstances, will probably occur with a frequency of less than 0.02 times per year (i.e. less than once in 50 years).

**IMPORTANT NOTE:** The likelihood of an event or hazard occurring shall first be assessed over the duration of the activity (i.e. “period of exposure”). For risk assessment purposes the assessed likelihood shall then be proportioned for a “period of exposure” of one year.

Example: An activity has a duration of 6 weeks (i.e. “period of exposure” = 6 weeks). The event or hazard being considered is assessed as likely to occur once every 20 times the activity occurs (i.e. likelihood or frequency = 1 event/20 times activity occurs = 0.05 times per activity). Assessed annual likelihood or frequency = 0.05 times per activity x 52 weeks/6 weeks = 0.4 times per year. Assessed likelihood = Possible.

**QUALITATIVE RISK ANALYSIS MATRIX – RISK RATING**

Likelihood	Consequence				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost certain (A)	Low 5	High 10	High 15	Very High 20	Very High 25
Likely (B)	Low 4	Medium 8	High 12	Very High 16	Very High 20
Possible (C)	Low 3	Low 6	Medium 9	High 12	High 15
Unlikely (D)	Low 2	Low 4	Low 6	Medium 8	High 10
Rare (E)	Low 1	Low 2	Low 3	Low 4	Medium 7

**MANAGEMENT APPROACH FOR RESIDUAL RISK RATING**

Residual Risk Rating	Required Treatment
Very High	Unacceptable risk. <b>HOLD POINT.</b> Work cannot proceed until risk has been reduced.
High	High priority, OSH MR and Roadworks Traffic Manager (RTM) must review the risk assessment and approve the treatment and endorse the TCD prior to its implementation.
Medium	Medium Risk, standard traffic control and work practices subject to review by accredited AWTM personnel prior to implementation.
Low	Managed in accordance with the approved management procedures and traffic control practices.

## TRAFFIC MANAGEMENT PLAN

### 6.2 Risk Register.

Item	Risk Event	Consequence	Pre – treatment Risk			Treatment	Residual Risk		
			L	C	RR		L	C	Risk Rating
1.	The interaction of work personnel with through traffic may result in increased potential for conflict and serious injury.	Injury to road workers.	B	4	VH (16)	The TMP provides for temporary traffic controls to be installed around the work site which will reduce the likelihood of conflict. Traffic Control is to be installed and maintained by appropriately qualified and experienced personnel. Operators to be instructed on safe procedures and spotters to assist drivers entering and leaving the site	D	4	M (8)
2	Road workers may be hit by drivers during set-up and take down of the signs and devices	Injury to road workers	B	4	VH (16)	Traffic management to be set up before road workers arrive and taken down after they leave.	D	4	M (8)
3	Traffic Control workers may be hit by vehicles during set up of the traffic control signs and devices.	Injury to traffic control personnel.	C	4	H (12)	Ensure traffic control workers are adequately trained/experienced and following appropriate procedures in accordance with AS 1742.3 when implementing traffic management.	D	4	M (8)
4.	A road user may misread the required alignment vehicles are to take on account of modifications required to accommodate road works. This could result in through vehicles colliding with work personnel or work vehicles.	Injury to road workers and road users.	C	3	M (9)	Traffic planning requires traffic controls to be installed to direct traffic around the work site and a reduction in the speed zone of the carriageways approaching and passing the works. The TMP and Traffic Control Diagrams detail the temporary controls and advance warning and directional signage to be used in accordance with the requirements of AS 1742.3. Ensure any lane closure use a Flashing Arrow Board as per TCDs. Traffic control personal shall conduct a drive through assessment of devices to evaluate the effectiveness following initial opening, any changes and at regular intervals throughout the day.	D	3	L (6)

## TRAFFIC MANAGEMENT PLAN

Item	Risk Event	Consequence	Pre – treatment Risk			Treatment	Residual Risk		
			L	C	RR		L	C	Risk Rating
5.	Incorrectly designed and / or installed traffic controls may result in inadequate protection of the worksite with a subsequent increased potential for crashes and injury.	Injury to road workers and road users.	D	3	L (6)	Qualified and experienced personnel have been employed in the preparation of the TMP and associated TCD's and experienced personnel will be used to implement and maintain the traffic control onsite.	E	3	L (3)
6.	Sun glare may result in a decreased readability of the traffic control delineation and signage and may increase the potential for crashes.	Injury to road users.	C	3	M (9)	The TMP requires that the Contractor undertakes a daily audit of the traffic control and make adjustments as are necessary to ensure effectiveness is maintained. Experienced personnel specialising in the erection and maintenance of traffic control will be used. All signage shall be Class 1 retro-reflective.	E	3	L (3)
7.	The restrictions placed on the traffic lanes by the works could result in roadway capacity being decreased to the point where unacceptable delays and congestion occur.	Unacceptable delays. Adverse public reaction.	E	3	L (3)	Traffic capacity is to be monitored and lane closures will only occur at times stipulated in the TMP. It is likely that allocation of additional "green time" for eastbound traffic during peak times will be made for the phasing of the traffic signals. This will accommodate the additional traffic in the single traffic lane	E	3	L (3)
8.	Restrictions and delays associated with the traffic control may cause unacceptable delays to emergency services.	Delay may result in failure to respond to an emergency.	D	3	L (6)	The TMP details the consultation and communication mechanisms undertaken with Emergency services and how these will be managed. It also requires that all works personnel respond to emergency traffic to facilitate safe and unhindered passage.	E	3	L (3)
9.	The interaction of non-motorised road users with through traffic and work plant may result in increased potential for conflict and serious injury.	Injury to pedestrians and other non-motorised road users.	C	3	M (9)	The works are not expected to impede pedestrian movements along South Street or Yarrick Street. The existing pedestrian crossing across South Street will be affected and pedestrians will be directed to an alternative crossing point. Traffic Controllers will be onsite to guide pedestrians and cyclists around the works as and when necessary.	D	3	L (6)
10.	The restrictions placed on the traffic lane width and corner geometry by the traffic management for heavy haulage traffic could result in increased potential for conflict and injury.	Injury to roadwork personnel and property damage.	C	3	M (9)	The TMP provides for the use of accredited traffic controllers to be used where required to direct traffic through the intersection. Where large or oversized vehicles are moving through the worksite, traffic controllers shall	D	3	L (6)

## TRAFFIC MANAGEMENT PLAN

Item	Risk Event	Consequence	Pre – treatment Risk			Treatment	Residual Risk		
			L	C	RR		L	C	Risk Rating
						be used to ensure sufficient carriageway width is provided and any workers adjacent to the traffic lanes or within a hazardous area are instructed to move clear of the traffic.			
11.	Road works may adversely impact on property access to adjacent properties.	Adverse public reaction.	B	1	L (4)	The TMP provides for consultation with property owners prior to commencement of works. Private access is limited to a driveway on South Street east of Yarrick Street and this will be maintained throughout the course of the works.	D	1	L (2)
12.	Bus services may be affected while works are undertaken on providing embayments	Adverse public reaction.	B	1	L (4)	Where possible, access to existing bus stops will be maintained. Where affected by the works, liaison will be undertaken with Transperth to agree on a temporary location for relocation of the stops.	D	1	L (2)
13.	Night after care: Head light glare may result in motorists misreading temporary signs installed at ground level and not driving to the conditions resulting in crashes.	Injury to road users and/or road workers.	C	3	M (9)	Once the traffic control installation is complete, traffic control personal shall conduct a drive through assessment of devices to ensure that headlight glare from on-coming vehicles does not jeopardize their visibility. Where the devices are adversely affected their location shall be rectified. All signs to be Class 1 Retro-reflective material All personnel shall wear High Visibility Retro-reflective Vest	D	3	L (6)
14.	Excavation on the South Street median due to drainage works may result in increased conflict for errant vehicles.	Injury to road users.	C	4	H (12)	Install a road safety barrier during drainage works when the excavation is exposed to road users.	C	3	M (9)
15.	Personnel installing the barrier may be hit by road users negotiating the site.	Injury to road workers.	C	4	H (12)	Set up traffic control with lane closures and reduced speed when installing barriers as per TCD.	D	4	M (8)
16.	Installation of barrier to work site restricts pedestrian access across South Street. Leading to dangerous crossing manoeuvres.	Injury to pedestrians and other non-motorised road users.	C	3	M (9)	The existing pedestrian crossing across South Street will be relocated to a position approximately 25m west of Yarrick Street.	D	3	L (6)
17.	Widening work adjacent to the pedestrian pathway may result in increased potential for conflict with work	Injury to pedestrians and other non-motorised road users.	C	3	M (9)	The TMP provides for containment fence to be installed adjacent to the path which will reduce the likelihood of conflict.	D	3	L (6)

### TRAFFIC MANAGEMENT PLAN

Item	Risk Event	Consequence	Pre - treatment Risk			Treatment	Residual Risk		
			L	C	RR		L	C	Risk Rating
	plant.								
18.	The restrictions placed on the traffic lane width with the installation of safety barrier could result in increased potential for conflict and injury.	Injury and property damage.	C	3	M (9)	The TMP provides for the barrier to be installed in accordance with manufacturers' specifications and road widening of the carriageway to maintain lane width and geometry.	D	3	L (6)
19.	Vehicles collide with barrier installation.	Injury and property damage.	C	3	M (9)	The TMP provides for the barrier to be installed in accordance with manufacturers' specifications with clearance to the barrier and crashworthy end treatments.	D	3	L (6)

### 6.3 Legal and other requirements.

The Contractor recognises that the traffic management plan has been developed and shall be implemented with due consideration and in accordance with the following legislative, environment and industry standards where applicable.

- Occupational Safety and Health Act 1984 and Regulations 1996
- Road Traffic Act
- Road Traffic Code 2000
- Australian Standard 1742.3 – Traffic control devices for works on roads
- AS/NZS ISO 31000: 2009 Risk Management – Principals and guidelines
- Australian Standard – Mobility and Access Standard for People with Disabilities AS 1428
- MRWA – Traffic Management for Works on Roads Code of Practice
- Utility Providers Code of Practice

The Contractor shall ensure that the requirements of these documents and other relevant information will be monitored and the Traffic Management Plan adjusted to meet changing requirements where necessary.

## 7 Emergency Arrangements

### 7.1 Emergency Services

Emergency services shall be notified via DFES of the proposed works nature, location, date and times as well as contact details for the site supervisor.

### 7.2 Dangerous Goods

Should any incident arise involving vehicles transporting dangerous goods, all work shall cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) shall be deployed immediately to ensure no traffic or other road users approach the area.

Emergency services shall be notified via DFES of the proposed works nature, location, date and times as well as contact details for the site supervisor. All site personnel shall be briefed on evacuation and control procedures.

### 7.3 Damage to Services

In the event that gas services are damaged, all work shall cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) shall be deployed immediately to ensure no traffic or other road users approach the area. The Police Service and relevant supply authority shall be called immediately. Damage to any other services shall be treated in a similar manner except machinery may remain operational and access may be maintained where it is safe to do so.

All site personnel shall be briefed on evacuation and control procedures.

### 7.4 Failure of Services

#### 7.4.1 Failure of Traffic Signals

In the event that traffic signal infrastructure is damaged and signals fail to operate or operate incorrectly, all work shall cease immediately and Traffic Controllers (and other personnel if necessary) shall be deployed immediately to control traffic movements through the intersection. Main Roads WA Traffic Operations Centre (TOC) shall be notified immediately.

#### 7.4.2 Failure of Street lighting

In the event that street lighting is damaged and fails to operate or operates incorrectly, Traffic Controllers (and other personnel if necessary) shall be deployed immediately if the lighting failure adversely affects road user safety to control traffic movements as required. Western Power shall be notified immediately.

### **7.4.3 Failure of Power**

In the event that power infrastructure is damaged and poses a risk through live current, Traffic Controllers (and other personnel if necessary) shall be deployed immediately to secure the site and prevent entry to the area affected by live power. Western Power shall be notified immediately.

## **7.5 Contingency Planning.**

### **7.5.1 Road Crash or Vehicle Breakdown within Site.**

Road plant within the work area that may impact on any services requiring access to a crash site will be cleared from the area quickly as necessary.

On-site traffic controllers will be equipped with mobile communications to advise and/or liaise with emergency services to ensure a prompt response should the need arise.

There will be accredited First Aid personnel on site to assist where required.

### **7.5.2 Serious Injury or Fatality.**

In the case of serious injury or fatality occurring within the traffic control zone all work shall cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) shall be deployed immediately to ensure no traffic or other road users approach the area.

Emergency services shall be notified of the incident and all road workers and traffic management personnel shall preserve the scene leaving everything in situ, until direction is given by Police or Work safe.

If it is determined that a road closure point is required on South Street, to preserve the site, detour routes will be put in place to the West at Stock Road and to the East at Ladner Street. The exit to South Street from Ladner Street will also need to be closed. This will be signed and controlled by traffic management personnel with road closure, detour signs and / or other devices outlined in Appendix B of AS1742.3. This detour will be advised to Police, who will take charge of the site upon arrival. The RAV mapping system (see appendix E) indicates Stock Road and Ladner Street can be accessed via Peel Road and all will cater for all heavy vehicle types that access South Street.

All site personnel shall be briefed on control procedures covering incidents and crashes that result in serious injury or fatalities.

## 7.6 Emergency Contacts

In the event of an emergency the following relevant authorities must be contacted and advised of nature of works, location, type of emergency and contact details for the site supervisor.

<b>Emergency Service</b>	<b>E-mail/Website</b>	<b>Phone (Emergency)</b>
WA Police Service	<a href="mailto:State.Traffic.Intelligence.Planning.&amp;.Co-ordination.Unit@police.wa.gov.au">State.Traffic.Intelligence.Planning.&amp;.Co-ordination.Unit@police.wa.gov.au</a>	000
St. John Ambulance	<a href="mailto:ambulanceoperations@stjohnambulance.com.au">ambulanceoperations@stjohnambulance.com.au</a>	000
DFES	<a href="http://www.dfes.wa.gov.au/contactus/pages/dfesoffices.aspx">www.dfes.wa.gov.au/contactus/pages/dfesoffices.aspx</a>	000
Power	<a href="http://www.westernpower.com.au/customerservice/contactus/">http://www.westernpower.com.au/customerservice/contactus/</a>	13 13 51
Gas	<a href="mailto:enquiries@atogas.com.au">enquiries@atogas.com.au</a>	13 13 52
MRWA TOC	<a href="mailto:dltocoperators@mainroads.wa.gov.au">dltocoperators@mainroads.wa.gov.au</a>	9323 4848

## 8 Approvals

### 8.1 General

Prior to works commencing it is considered necessary to advise all road users of the forthcoming works, the likely timeframe of the works and the road conditions likely to be encountered. Advice shall consist of the following:

- Liaison with emergency services (i.e. Police, St John Ambulance, Fire and Emergency Services)
- Liaison with Local authorities regarding local issues;
- Liaison as necessary with affected residents.

Refer front cover for register of approvals by road and service authorities.

## 9 Notification

### 9.1 Public Notification

The public shall be notified of the works and traffic management arrangements via:

- Notice to Motorists in the weekend West Australian placed two weeks in advance, one week in advance and at the commencement of works;
- Letter drop to all residents within the traffic control zone one week ahead of the scheduled works;
- Advance notification road signs to be installed two weeks prior to the works commencing; and
- VMS boards during the works.

### 9.2 Notification of Other Agencies

In accordance with the CoP all relevant agencies shall be notified using the 'Notification of Roadworks' form attached at Appendix "A". A distribution list is provided on the bottom of the form. Other agencies shall be notified as required.

## 10 Traffic Assessment.

### 10.1 Existing & Proposed Speed Zones

South Street is subject to a 70 km/h speed zone. Yarrick Street is subject to a 50 km/h speed zone.

The works are to occur during night hours when there is relatively low traffic volume. Due to the complexities of the site, e.g, night works, pedestrian movements, reduced lane widths, road safety barriers, merging and detours it is considered safer to reduce the speed to 40 km/h during all stages of work. .

This will require an exemption in accordance with Main Roads Guidelines, which require roadwork speed limits at long term roadworks to be not greater than 20 km/h below the posted speed limit (see appendix

### 10.2 Existing Traffic Environment

#### 10.2.1 Existing Traffic Environment

South Street is a Primary Distributor that carries a high volume of traffic, approximately 30 000 vpd, with up to 7.2 % commercial traffic. Recent traffic counts sourced from MRWA are shown over on Table 1.

As South Street is a Main Road exceeding 4000 vehicles per day per lane and the works exceed 6 weeks the works are defined as Long term works and will be in accordance with the Main Roads Traffic Management at Roadworks State Roads Policy and Application Guidelines.

### 10.3 Minimum Lane Requirements and Carriageway Impacts.

Austrroads 'Roadway Capacity' guidelines suggest that the mid block capacity of a typical urban arterial road is in the vicinity of 1,000 vehicles per lane per hour (vplph).

Traffic volumes sourced from MRWA and shown over indicate that the traffic flow on South Street peaks at about 1200 vehicles in each direction during both the AM and PM peak hour periods.

The potential impact on the movement of traffic through an intersection affected by works is greater than that associated with mid-block works, and lane capacities are normally expected to be reduced to about 500 vehicles per hour per lane where works are undertaken within 200 metres of an intersection. As such times when lane closures apply will recognise impacts and only be undertaken at suitable times when traffic volumes can be accommodated within the available traffic lanes or within the periods provided for by Main Roads WA.

Using the Main Roads Traffic Calculator a 40 km/h temporary speed limit will not have an adverse impact on the traffic flow for both Eastbound and Westbound carriageways.

# Volume by Hour

04 Aug 2016 to 07 Aug 2016

South St (H032)  
West of North Lake Rd (SLK 4.48)

Count:Axle Pairs

Average Vehicle Volume														Directional				
Hour	Mon		Tue		Wed		Thu		Fri		Sat		Sun		Mon - Fri		Mon - Sun	
	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W
0000							89	68	89	37	119	142	185	130	89	53	121	94
0100							55	39	49	40	98	100	128	136	52	40	83	79
0200							48	36	46	30	63	66	108	121	47	33	66	63
0300							48	41	32	43	69	49	78	98	40	42	57	58
0400							78	113	69	102	58	39	67	56	74	108	68	78
0500							244	385	250	268	113	147	94	125	247	327	175	231
0600							635	783	554	660	234	266	138	183	595	722	390	473
0700							1049	936	1045	1010	386	557	268	313	1047	973	687	704
0800							1132	877	1150	1092	581	781	387	431	1141	985	813	795
0900							1048	756	1061	1241	862	899	583	590	1055	999	889	872
1000							1057	743	1036	1364	1074	1107	742	959	1047	1054	977	1043
1100							1130	730	1161	1150	1257	1238	1039	985	1146	940	1147	1026
1200							1214	767	1251	1105	1280	1046	1052	1146	1233	936	1199	1016
1300							1178	676	1287	945	1253	1071	1088	1086	1233	811	1202	945
1400							1282	803	1304	1177	1190	979	1020	835	1293	990	1199	949
1500							1400	1212	1395	1377	1183	899	946	829	1398	1295	1231	1079
1600							1391	1234	1353	1396	1034	797	857	583	1372	1315	1159	1003
1700							1320	1364	1276	1227	945	986	791	0	1298	1296	1083	894
1800							785	1105	923	937	736	840	534	0	854	1021	745	721
1900							553	661	598	681	511	711	397	0	576	671	515	513
2000							465	497	491	352	447	411	340	0	478	425	436	315
2100							371	397	507	344	457	243	305	0	439	371	410	246
2200							222	135	344	286	393	263	162	0	283	211	280	171
2300							131	65	266	253	272	181	92	0	199	159	190	125
Total							16925	14423	17537	17117	14615	13818	11401	8606	17236	15777	15122	13493

Table 1

## 10.4 Duration and Hours of Proposed Works

The modification works are expected to be undertaken over a 16 week period between April and July 2017.

Restrictions to apply are:

- A lane closure may be installed on the EB carriageway of South Street only between 6 pm and 7 am.
- A lane closure may be installed on the WB carriageway of South Street only between 7 pm and 10 am.
- Yarrick Street and the crossing point may be closed provided a full detour is installed.

### 10.5 Intersection Works.

The work is located immediately prior to the intersection of South Street and Stock Road and as such, the closure of the "fast" median side through traffic lane is required prior to the intersection. Eastbound traffic volumes recorded are in the order of 1,500 vph during peak hours.

As such, an assessment of the intersection using the Sidra Software was undertaken in order to predict the lane volume at which the intersection would cease to operate at a reasonable Level of Service. In order to achieve this, the existing configuration was modelled on PM peak flows and this model adjusted to provide for one lane on the South Street eastbound approach and further modelling applied to identify critical flow rates. Having identified critical flow rates, permissible times of lane closure were identified and are indicated on Table 1 by red borders.

Sidra Analysis is shown in Appendix E.

It is likely that allocation of additional "green time" for this movement will be made for the phasing of the traffic signals. This will accommodate the additional traffic in the single traffic lane.

It is proposed to retain the single traffic lane eastbound on the approach to the intersection between the hours of 1800 and 0700 when the traffic volumes fall below that of the peak hours.

### 10.6 Barrier Requirements

The Barrier Guard 800 temporary road safety barrier system shall be used to protect the worksite during drainage works. The Quadguard CZ terminal shall be used to protect the ends of the barrier. The barriers shall be installed in accordance with the design indicated in Appendix F, TCD MRWA -003, the requirements of the manufacturer, MRWA technical guidelines and Australian Standard AS 3845. The barrier shall be installed during/after stage 2 works, using TCD MRWA-002 to ensure workers are adequately protected.

## 11 Traffic Management Implementation.

### 11.1 Traffic Management Staging.

In terms of traffic management, the roadwork will occur in 5 stages, which are outlined below.

All traffic management will be undertaken in accordance with AS 1742.3 and the attached Traffic Control Diagram for each Stage.

A 40km/h speed zone will be imposed on the approaches to and past the worksite.

Appropriate road condition advisory signage will be installed on the approaches to the work site at the end of work shift.

#### 11.1.1 Stage 1

Stage 1 works will involve widening the eastbound carriageway, removing the existing lane line marking and installing temporary raised retroreflective pavement markings (RRPMs).

The works will be completed under a kerbside lane closure (see TCD MRWA - 001) the lane closure must only occur between 6.00 pm and 7.00 am. If works last longer than one shift aftercare will need to be implemented opening all traffic lanes (see TCD MRWA – 008).

A temporary 40km/h speed zone will be implemented past the worksite.

Approach and departure signage, lane closures and traffic control devices shall be installed in accordance with the Traffic Control Diagrams, MRWA Traffic Management for Works on Roads Code of Practice and Australian Standard AS 1742.3 for the duration of the stage

### **11.1.2 Stage 2**

Stage 2 works will involve widening on Yarrick Street and in the South Street median to accommodate the right turn bay and installation of the seagull island.

The works will be completed under median lane closures and a closure of Yarrick Street (See TCD MRWA – 002).

Stage 2 will also involve installing the temporary road safety barrier in the median that is required for Stage 3 works. A temporary 40km/h speed zone will be implemented past the worksite due to the eastbound and westbound lane closures; works shall only take place between 7.00 pm and 7.00 am. Due to high traffic volumes all traffic lanes need to be open between 7.00am and 7.00 pm and TCD MRWA -009 shall be implemented.

Due to the works requiring the closure of the Yarrick Street entry from South Street a detour has been provided to ensure road users can access the shops on Yarrick Street (see TCD MRWA – 010).

Approach and departure signage, lane closures and traffic control devices shall be installed in accordance with the Traffic Control Diagrams, MRWA Traffic Management for Works on Roads Code of Practice and Australian Standard AS 1742.3 for the duration of the stage.

### **11.1.3 Stage 3**

Stage 3 works will involve construction of the drainage structure in the South Street median.

The works will be completed under an eastbound median lane closure while sheet piling is installed. Widening of the carriageway will allow two eastbound traffic lanes to be open. No turning into Yarrick Street from either South Street carriageway will be permitted whilst drainage installation is completed (see TCD MRWA - 003). A detour will be in place for vehicles unable to access Yarrick St (see TCD MRWA - 004)

A temporary 40km/h speed zone will be implemented past the worksite. Traffic controllers will monitor the impacts of the 40 km/h speed zone on traffic congestion. When no workers are on site worker symbolic signs will be removed and a 60 km/h speed zone will be installed.

Approach and departure signage, lane closures and traffic control devices shall be installed in accordance with the Traffic Control Diagrams, MRWA Traffic Management for Works on Roads Code of Practice and Australian Standard AS 1742.3 for the duration of the stage.

### 11.1.4 Stage 4

Stage 4 works will involve construction of the eastbound bus bay. During stage 4 works the temporary RRPMS will be removed and permanent line marking applied.

The works will be completed under a kerbside lane closure (see TCD MRWA - 005). Due to traffic volumes the eastbound lane closure shall only be applied between 6.00 pm and 7.00 am. Outside of this time TCD MRWA – 008 will be implemented.

A temporary 40km/h speed zone will be imposed past the worksite.

Approach and departure signage, lane closures and traffic control devices shall be installed in accordance with the Traffic Control Diagrams, MRWA Traffic Management for Works on Roads Code of Practice and Australian Standard AS 1742.3 for the duration of the stage.

### 11.1.5 Stage 5

Stage 5 works will involve construction of the westbound bus bay.

The works will be completed under a kerbside lane closure (see TCD MRWA - 006). Due to the westbound lane closure, works shall only take place between 7.00 pm and 10.00 am. Due to high traffic volumes all traffic lanes need to be open between 10.00am and 7.00 pm and TCD MRWA -011 shall be implemented

A temporary 40km/h speed zone will be implemented past the worksite.

Approach and departure signage, lane closures and traffic control devices shall be installed in accordance with the Traffic Control Diagrams, MRWA Traffic Management for Works on Roads Code of Practice and Australian Standard AS 1742.3 for the duration of the stage.

### 11.1.6 Night Work Provisions

Due to the high traffic volumes during the peak times, night works will be undertaken during Stages 1, 2, 4 and 5. The existing street lighting provides adequate illumination for traffic moving through the work site after working hours. The traffic management scheme will be monitored by traffic controllers to ensure road users are adequately catered for.

## 11.2 Hazard Identification, Risk Assessment and Control

In establishing adequate controls for the hazards identified ABC Contractors Pty Ltd have used a structured approach via the use of the hierarchy of control as outlined below:

- Elimination
- Substitution
- Engineering
- Administration
- Personal Protection Equipment

## TRAFFIC MANAGEMENT PLAN

ABC Contractors Pty Ltd traffic management practices require that the site Supervisor evaluate all traffic arrangements before they are open to traffic and immediately following the opening to traffic. Adjustments are to be made as required and recorded in the daily diary, including reasons for the changes. The Supervisor is also required to evaluate the traffic arrangements where site conditions change. New hazards that arise throughout the work will be subject to risk assessment and incorporated onto the Risk Register.

### 11.3 Traffic Control Diagrams

The Traffic Control Diagrams outlined in Appendix "D" and listed below have been provided for the following stages to demonstrate the type of controls that will be implemented throughout the term of the contract

Drawing Number	Version	Details
MRWA -001	B	Stage 1 - Carriageway Widening Works. Eastbound lane closure to allow widening of the eastbound carriageway for stage 3 works and removing the existing lane line marking and installing temporary RRPMS. The lane closure is only to be installed between 6.00 pm and 7.00 am.
MRWA - 002	C	Stage 2 -Median lane closures plus Yarrick Street closure. To allow construction of Yarrick Street and median works in South Street. Restrictions apply (South Street lane closures to occur between 7pm and 7am.Full detour shall be installed. Temporary Road Safety Barriers for stage 3 works to be installed with lane closures in place
MRWA - 003	C	Stage 3 - Eastbound median lane closure. To allow construction of Yarrick Street works and drainage works in South Street median. The carriageway widening will allow for two eastbound lanes with a lateral shift. Access to Yarrick Street to be left open and detour installed for westbound traffic exiting Yarrick Street. When no workers on site – remove worker symbolic signs and install a 60 km/h speed zone.
MRWA - 005	B	Stage 4 -Eastbound lane closure. To allow construction of north side bus bay, removal of temporary RRPMS and new lane line marking. Restrictions apply (A lane closure may be installed on the EB of South Street between the hours of 6pm and 7 am. Access to Yarrick Street to be left open).
MRWA - 006	A	Stage 5 -Westbound lane closure. To allow construction of south side bus bay. Restrictions apply (A lane closure may be installed on the WB of South Street between the hours of 7pm and 10am).
MRWA - 004	A	Detour plan for Stage 3.
MRWA - 008	B	Aftercare for stages 1 and 4 – reopen EB lane between 7am and 6pm
MRWA - 009	C	Aftercare stage 2 – reopen WB and EB lanes between 7am and 7pm
MRWA - 010	C	Detour plan Stage 2
MRWA - 011	B	Aftercare stage 5 – reopen WB lane between 10am and 7pm
MRWA-012	A	Pedestrian Management – Stage 1 and Stage 4
MRWA-013	A	Pedestrian Management – Stage 2

### 11.4 Sequence and Staging

All activities relating to installation, staging and removal of signage, lane closures and work activities shall be recorded in the Daily Diary detailing that the time at which they occur. The sequence of traffic control is shown on the Table below.

## TRAFFIC MANAGEMENT PLAN

Step	Details
1	Stage 1 Erect approach and departure advisory signage on approaches to worksite.
2	Install delineation devices and lane closures as required.
3	Undertake and complete stage works.
4	Stage 2 Modify approach signage and delineation as required
5	Undertake and complete stage works.
6	Repeat steps 4 and 5 until works are completed.
7	Remove approach and departure advisory signage.

### 11.5 Signage and Device Requirements.

Signage requirements are shown on each Traffic Control Diagram.

Should the use of additional (not shown on the TCD or listing of devices) or reduced number of devices be required due to unforeseen needs, they shall be recorded within the Daily Diary as a variation to the TMP, following prior approval.

## 12 Communication.

### 12.1 General

Prior to works commencing it is considered necessary to advise all road users of the forthcoming works, the likely timeframe of the works and the road conditions likely to be encountered. Advice shall consist of the following:

- Liaison with emergency services (i.e. Police, St John Ambulance, Fire and Emergency Services)
- Liaison with Local authorities regarding local issues;
- Liaison as necessary with affected residents.

## 13 Traffic Management Monitoring.

### 13.1 Daily Inspections

Prior to works commencing the Site Supervisor shall undertake to communicate the Traffic Management Plan to all key stakeholders and affected parties.

On completion of setting out the traffic control measures, the site is to be monitored for a suitable period of time. If traffic speeds on the approaches to the work site are assessed as being above the temporary posted speed zone for the work site, the Site Supervisor is to initiate action to modify the approach signage and tapers in accordance with the requirements of AS1742.3. All such actions are to be recorded in the Daily Diary. Should road users be observed to continue to travel in excess of the posted speed limit, the police are to be requested to attend the site to enforce the temporary posted speed limit.

The Advanced Worksite Traffic Management accredited supervisory person at the worksite may conditionally approve changes made to a complex traffic management plan subject to review and endorsement of the change by an RTM as soon as practicably possible.

## TRAFFIC MANAGEMENT PLAN

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The Traffic Management Contractor shall ensure that all temporary signs, devices and controls are maintained at all times. To achieve this, procedures in line with the requirements outlined in AS1742.3 Appendix A will be instituted. The monitoring program shall incorporate inspections:

- Before the start of work activities on site,
- During the hours of work,
- Closing down at the end of the shift period, and
- After hours.

A daily record of the inspections shall be kept indicating

- When traffic controls were erected,
- When changes to controls occurred and why the changes were undertaken,
- Any significant incidents or observations associated with the traffic controls and their impacts on road users or adjacent properties.

The Traffic Management Contractor shall ensure that personnel are assigned to monitor the traffic control scheme. Inspections shall at least satisfy the following requirements.

### 13.1.1 Before work starts.

- Inspect all signs and devices to ensure they are undamaged and comply with the requirements depicted on the Traffic Control Diagrams.
- Switch off all lamps check and clean as necessary;
- Confirm Traffic Management plan for the day's activities;
- After any adjustments have been made to the signs and devices, conduct a drive through inspection to confirm effectiveness.

### 13.1.2 During Work hours.

- Designate and ensure that appropriate work personnel drive through the site periodically to inspect all signs and devices and ensure they are undamaged and comply with the requirements depicted on the Traffic Control Diagrams;.
- Conduct on the spot maintenance/repairs as required;
- When traffic controllers are on the Job, ensure they remain in place at all times. Relieve controllers as necessary to ensure attentiveness is retained;
- Re position signs or required by work processes throughout the day and keep records of any changes.

### 13.1.3 Closing down Each Day

- Conduct a pre-close down inspection, allowing time for any appropriate maintenance works;

- Remove any unnecessary signage (e.g. Prepare to Stop, Symbolic Workers on Road)
- Install barriers and lights where required;
- Drive through site and confirm all signs and devices are operating correctly;
- Record details of inspection and any changes made to layout.

### 13.1.4 After Hours

- Appoint personnel to conduct after dark checks. Observe any signs / devices not working, missing or damaged and record in diary.
- Appoint personnel to conduct checks on non-work days (e.g. weekends). Observe any signs / devices not working, missing or damaged and record in diary.
- Provide after-hours contact names and numbers for implementation of maintenance and repairs arising from the above inspections.

### 13.2 TMP Auditing

A Compliance Audit shall be undertaken by an RTM within 3 days of the traffic management scheme being established and shall reoccur within 3 months. These audits must assess compliance with the TM at Roadworks on State Roads Policy and Application Guidelines, AS1742.3 and Main Roads' Code of Practice.

Audit findings, recommendations and actions taken shall be documented and copies forwarded to the Project Manager and the Road Authority's Representative.

Regular Operational Checks shall be conducted by the traffic management representative and/or project team to ensure the TMP is operating as safely and efficiently as intended.

### 13.3 Records.

A daily diary recording all inspections including variations to the approved TMP shall be kept using Standard Forms "Daily Diary".

The Traffic Supervisor is to record all inspections made on a daily basis and at those times prescribed by the Traffic Management Implementation Standards. Upon completion of each day the Traffic Supervisor shall provide copies of the daily diary record to the Project Manager.

The Traffic Supervisor is to record all variations made to the approved Traffic Management Plan on a daily basis and indicate clearly the nature of the variations and the reason for the variations. Upon completion of each day the Traffic Supervisor shall provide copies of the variation record to the Project Manager.

## 14 Traffic Management Implementation Standards.

### 14.1 Sequence and Staging

Before work commences, signs and devices at approaches to the work area shall be erected in accordance with the adopted TCD, in the following order:

- Advance warning signs.
- All intermediate advance and positional signs and devices required in advance of the taper or start of the work area.
- All delineating devices required to form a taper including flashing arrow signs or temporary hazard markers where required.
- Delineation past the work area or into a side track.
- Other warning signs or regulatory signs.

Delineation devices such as cones and bollards should be placed in the same sequence, i.e. those furthest in advance of the work placed first.

The following requirements shall be observed when implementing traffic management signs and devices:

- Display of a vehicle mounted warning device on a work vehicle parked off the roadway.
- Sight distance to oncoming traffic of at least 50 m.
- A lookout person to warn workers on road on the roadway of approaching traffic.

Where a work area is moving progressively along the road, relocation of the signs ahead should take place in the above sequence. Those behind should be relocated in the reverse sequence.

Signs and devices that are erected before they are required shall be covered by a suitable material. The cover shall be removed immediately prior to the commencement of work.

Removal of traffic control signs and devices should be undertaken in the reverse order of erection, progressing from the work area out toward the approaches.

Refer to Traffic Control Diagrams in specific Traffic Management Plans for individual worksite details. General sequence for implementing, maintaining and dismantling traffic control shall be as below.

## 14.2 Signage

### 14.2.1 Alignments and signage details.

The requirements for the closure and realignment of lanes and any other traffic arrangement necessary to accommodate the works shall be detailed in specific Traffic Management Plan work staging and on the Traffic Control Diagrams. All traffic control shall be implemented and maintained in accordance with the requirements of Australian Standard AS 1742.3, Main Roads WA Traffic Management for Works on Roads, Code of Practice and these Standard Practices.

### 14.2.2 Requirements for signs.

All signs used shall conform to the designs and dimensions as shown in Australian Standard AS 1742.3 and the Main Roads WA Traffic Management for Works on Roads, Code of Practice.

## TRAFFIC MANAGEMENT PLAN

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Prior to installation, all signs and devices shall be checked by the Site Supervisor or a suitably qualified person to ensure that they are in good condition and meet the following requirements:-

- Mechanical condition - Items that are bent, broken or have surface damage shall not be used.
- Cleanliness - Items should be free from accumulated dirt, road grime or other contamination.
- Colour of fluorescent signs - Fluorescent signs whose colour has faded to a point where they have lost their daylight impact shall be replaced.
- Retroreflectivity. - Signs for night-time use whose retroreflectivity is degraded either from long use or surface damage and does not meet the requirements of AS 1906 shall be replaced.
- Battery operated devices - shall be checked for lamp operation and battery condition.

Where signs do not conform either to the requirements of AS 1742.3 or would fail to pass any of the above checks, they shall be replaced on notice.

Signs and devices shall be positioned and erected in accordance with the locations and spacings shown on the drawings. All signs shall be positioned and erected such that:-

- They are properly displayed and securely mounted;
- They are within the driver's line of sight;
- They cannot be obscured from view;
- They do not obscure other devices from the driver's line of sight;
- They do not become a possible hazard to workers or vehicles; and
- They do not deflect traffic into an undesirable path.

Signs and devices that are erected before they are required shall be covered by a suitable opaque material. The cover shall be removed immediately prior to the commencement of work.

Where there is a potential for conflict of information between existing signage and temporary signage erected for the purpose of traffic control, the existing signs shall be covered. The material covering the sign shall ensure that the sign cannot be seen under all conditions i.e. day, night and wet weather. Care will be taken to ensure existing signs are not damaged by the covering material or by adhesive tape.

### **14.2.3 Tolerances on positioning of signs and devices**

Where a specific distance for the longitudinal positioning of signs or devices with respect to other items or features is stated, for the spacing of delineating devices or for the length of tapers or markings, the following tolerances may be applied: -

- (a) Positioning of signs, length of tapers or markings:
  - (i) Minimum, 10% less than the distances or lengths given.
  - (ii) Maximum, 25% more than the distances or lengths given.
- (b) Spacing of delineating devices:

- (i) Maximum, 10% more than the spacing shown.
- (ii) No minimum.

These tolerances shall not apply where a distance, length or spacing is already stated as a maximum, a minimum or a range.

### **14.3 Flashing Arrow Signs.**

Where flashing arrow signs are required to better delineate lane tapers, these signs will comprise a matrix of lamps or light emitting elements in the form of an arrow that is flashed in a cyclical manner to provide advance warning. The sign shall have a minimum dimension of 2400 mm. x 1200 mm. and conform to the requirements of AS/NZS 4192. The Project Site Supervisor shall ensure that all equipment used meets the Australian Standard.

### **14.4 Delineation.**

#### **14.4.1 General**

Cones shall be used for delineation unless other treatment is specified in the Traffic Management Plan or on the Traffic Control Diagrams. All cones shall be at least 700 millimetres in height and constructed from fluorescent orange or red material that is resilient to impact and will not damage vehicles when hit at low speed. Cones will be fitted with suitable white retro-reflective tape placed in accordance with AS 1742.3.

Cones shall be designed to be stable under reasonably expected wind conditions and air turbulence from passing traffic.

The base of the cones will be secured so that they are not dislodged by traffic. Cones will be inspected at intervals necessary to ensure any misalignment or displacement is identified and corrected prior to this causing disruption to traffic.

Where specified, cones will be supplemented with stationary unidirectional yellow lights conforming to AS 1165 and spaced at 15 metre intervals.

Where specified, temporary frangible or otherwise non-hazardous delineator posts or bollards may be used for edge protection and taper delineation. Posts or bollards shall have a maximum dimension of 60 millimetres when measured along the longest side of a square or rectangular section or across the diameter of a circular section. Base design shall permit easy fixing to either sealed or unsealed surfaces and not intrude into traffic lanes greater than 50 millimetres from the face of the post or bollard.

All posts or bollards shall be erected in accordance with the Traffic Control Diagrams. Posts and bollards shall be a minimum of 1000 mm. high, capable of being fixed to the road pavement by a suitable road adhesive or by fastening bolts or spikes. Fixing shall be in accordance with manufacturer's recommendations.

Posts and bollards shall be fitted with suitable white retro-reflective tape placed in accordance with AS 1742.3.

## TRAFFIC MANAGEMENT PLAN

All posts or bollards will be inspected daily and where displaced or missing made good immediately. All delineator posts are to be completely removed at the completion of all stages of construction and prior to the placement of asphalt surfacing. If adhesive is used to affix the posts this shall be completely removed from the road surface so that a flush surface is obtained.

### 14.4.2 Delineation spacing.

All cones and post type delineators shall be spaced according to Table 3.7 of AS 1742.3.

**TABLE 3.7**  
**RECOMMENDED MAXIMUM SPACING OF CONES AND BOLLARDS**

Purpose and usage	Traffic speed, km/h (see Clause 1.4.16)	Recommended maximum spacing, m
All purposes	≤50	4
Centre-line on approach to a traffic controller position	All cases (see Clause 4.6.4)	4
Outer edge of traffic lanes—e.g. works on shoulder or parking lane	51 to 70 >70	18 24*
Separating opposing traffic on a 2-lane, 2-way road—e.g. partial or complete lane closure	51 to 70 >70	12 18
Separating opposing traffic on a multilane undivided road—e.g. as part of a lane closure	51 to 70 >70	12 18
Adjacent to a closed lane on a multilane undivided road	51 to 70 >70	18 24
Merge tapers (see Clause 4.8.2)	51 to 70 >70	9 12
Lateral shift tapers (see Clause 4.8.2)	51 to 70 >70	12 18
Protecting freshly painted lines	51 to 70 >70	24 60†

\* This spacing may be extended to 60 m where the length of the line of cones or bollards exceeds 1 km but not adjacent to locations where there are workers on foot.

† This spacing may need to be reduced on curves or crests, or if the row of cones is not clearly defined at night.

### 14.5 Speed zoning.

Temporary speed zones shall be implemented as detailed the staged traffic control diagrams during work shift hours in accordance with the Traffic Management Plan and guidelines contained in Australian Standard AS 1742.3.

Speed zones shall be in accordance with the guidelines contained in Australian Standard AS 1742.3 and as prescribed in the Traffic Management Plan and detailed on the Traffic Control Diagrams.

### 14.6 Provision for night works.

All signs used at night are to be Class 1 Retro-reflective material and delineation will be either retro-reflective or be sufficiently illuminated.

Flashing lamps shall be used to draw attention to signs and all personnel engaged on night work shall wear high visibility retro-reflective jackets.

### 14.7 Temporary Pavement Markings

Temporary pavement markings shall be installed after each individual stage of works prior to the application of the ultimate pavement marking in accordance with the following:

- After profiling works lanes shall be delineated by temporary RRPMS.
- After asphalt works have been carried out lanes shall be delineated by either ultimate pavement markings, temporary RRPMS or temporary painted pavement markings.
- Temporary RRPMS shall be installed at not less than 4m spacing and not greater than 12m spacing.

### 14.8 Aftercare Signage

Aftercare signage shall be installed between work shifts as determined to be applicable on site and applicable to the state of completion of the road works and pavement markings in accordance with the following requirements:

- Aftercare signage shall be the installation of 'Roadwork Ahead', 'End Roadwork' and temporary speed zone signage on the approach and departure to the work site and being set out in accordance with AS 1742.3 and as detailed on the attached TCD's.
- The actual work areas shall be delineated with bollards and temporary hazard markers.
- The temporary speed zone shall be maintained during out of work hours where necessary with opaque material covering existing speed zone signs where required.
- All symbolic worker signage shall be removed or laid flat during out of work hours.
- Where new pavement is sealed with road metal Symbolic Windscreen Damage (T3-9) signs shall be installed where the loose surface remains between successive work shifts.
- New Work No Lines Marked (T3-11) signs shall be installed where existing separation lines have been removed and have not yet been reinstated or where temporary RRPMS are used for lane delineation purposes.
- No Lines Marked Do Not Overtake Unless Safe (T3-12) signs shall be installed where existing barrier lines or painted medians have been removed and have not yet been reinstated.

### 14.9 Taper Lengths

A temporary speed zone along the South Street approaches to the work site is to be modified to 40km/h.

Required length of merge taper for 40km/h per AS1742.3: 15 m

Merge taper length to be provided: 60 m

## 15 Management Review

### 15.1 TMP Review and Improvement

As this project is of a short-term nature, a review of the effectiveness of the TMP will be undertaken by the Project Manager as part of the close-out procedure (see traffic management monitoring for audit requirements).

### 15.2 Variations to Standards and Plans

There are no departures from the requirements of AS 1742.3-2009 or MRWA Traffic Management for Works on Roads Code of Practice (April 2011). The work hours have been adjusted to fall within the hours when traffic volumes will permit the necessary traffic lane closures.

On-site variations, if required, shall generally only be made following approval by the Road Authority's Representative and recorded in the daily diary. In emergency situations, on-site variations shall be made and recorded in the daily diary, and the Road Authority's Representative notified as soon as practicable. Any variations to Standards will be recorded on the form shown in the Appendices.

## 16 References

- AS 1742 – Manual of uniform traffic control devices
  - Part 1 – General introduction and index of signs
  - Part 2 – Traffic control for general use
  - Part 3 – Traffic control for works on roads
  - Part 4 – Speed controls
- AS/NZS ISO 31000– Risk Management – Principles and Guidelines
- AS/NZS 4602– High visibility safety garments
- Disability Services Act
- Guide to Preparation of Traffic Management Plans
- Local Government Act
- Main Roads Act
- MRWA Specification 202
- Occupational Safety & Health Act
- Occupational Safety & Health Regulations

## TRAFFIC MANAGEMENT PLAN

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- Road Traffic Act
- Road Traffic Code
- Traffic Controllers' Handbook
- Traffic Management at Roadworks on State Roads, Policy and Application Guidelines
- Traffic Management for Events Code of Practice
- Traffic Management for Works on Roads Code of Practice
- Traffic Management Plan Preparation Guidelines
- Truck and Trailer Mounted Attenuator National Guidelines
- Utility Providers Code of Practice for Western Australia

## TRAFFIC MANAGEMENT PLAN

### Appendix A Notification of Road works

Anticipated start date	April 2017		Anticipated finish date	July 2017		
Daily work hours	Varies		Weekend work applicable	Yes <input checked="" type="checkbox"/>	No	
Location of works (Road/Street, Suburb)	Intersection of South Street, Yarrick Street in O'Connor.					
Description of works	Carriageway and intersection modification works, installation of drainage structures					
Road type (eg two lane undivided)	Four lane Primary Distributor Road and two lane Access Road					
Posted Speed Limit	70 / 50 km/h	Worksite speed limit	40 km/h	After hours speed limit	60 km/h	
Brief description of traffic management during works	Lane closures and implementation of a detour.					
Description of traffic management devices used	Advance advisory signs, bollards, hazard boards.					
What is the anticipated effect on traffic flows?	Moderate – minor delays only		Will there be restricted width for oversize escorted vehicles?	Yes	No <input checked="" type="checkbox"/>	
Are lanes closed at signals?	Yes	No <input checked="" type="checkbox"/>	N/A	Are signal loops or hardware affected?	Yes	No <input checked="" type="checkbox"/>
Will signal phases need time changes?	Yes	No <input checked="" type="checkbox"/>	N/A	Will signals need to revert automatically?	Yes	No <input checked="" type="checkbox"/>
Date of signal "black out"	N/A		Times of signal "black out"	N/A		
Will Police attendance be required?	Yes	No <input checked="" type="checkbox"/>	Dates for Police attendance (See note below) <sup>(1)</sup>	N/A		
Are warden-controlled school crossings located in area of works?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Will crossings be altered during works?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Construction Authority	City of Melville					
Postal address	10 Almondbury Road Booragoon, 6154					
Telephone	1300-635-845	Facsimile	(08) 9364 0285	Email	admin@melville.wa.gov.au	
Contact						
Telephone		Mobile		Email		
Construction contractor	ABC Contractors Pty Ltd					
Postal address	1 Some Place CARLISLE WA 6101					
Telephone	5551 7370	Facsimile	5551 7375	Email	Pm@abc.com.au	
Contact	P Manager					
Telephone	5551 7370	Mobile	0555 920 224	Email	Pm@abc.com.au	
After hours contact	P Manager		Telephone	5551 7370	Mobile	0555 920 224
Traffic management contractor	TBA					
Postal address						
Telephone		Facsimile		Email		
Contact						
Telephone		Mobile		Email		
After hours contact			Telephone		Mobile	
Notification is to be given at least three (3) weeks in advance where Police attendance is required, one (1) week otherwise – except in an emergency						
WA Police State Traffic Coordination	<a href="mailto:State.Traffic.Intelligence.Planning.&amp;Co-ordination.Unit@police.wa.gov.au">State.Traffic.Intelligence.Planning.&amp;Co-ordination.Unit@police.wa.gov.au</a>					
WA Police Student Pedestrian Policy Unit	<a href="mailto:student.pedestrian.policy.unit@police.wa.gov.au">student.pedestrian.policy.unit@police.wa.gov.au</a>					
MRWA Customer Information Centre	<a href="mailto:enquiries@mainroads.wa.gov.au">enquiries@mainroads.wa.gov.au</a>					
MRWA Traffic Operations Centre	<a href="mailto:dltooperators@mainroads.wa.gov.au">dltooperators@mainroads.wa.gov.au</a>					
MRWA Heavy Vehicle Operations	<a href="mailto:hvo@mainroads.wa.gov.au">hvo@mainroads.wa.gov.au</a>					
MRWA Engineer Bridge Loading	<a href="mailto:DLSEHeavyLoadsGroup@mainroads.wa.gov.au">DLSEHeavyLoadsGroup@mainroads.wa.gov.au</a>					
St John's Ambulance	<a href="mailto:ambulanceoperations@stjohnambulance.com.au">ambulanceoperations@stjohnambulance.com.au</a>					
Local Government	admin@melville.wa.gov.au					
Public transport authority	<a href="http://www.pta.wa.gov.au/AboutUs/ContactUs/tabid/124/Default.aspx">www.pta.wa.gov.au/AboutUs/ContactUs/tabid/124/Default.aspx</a>					

## Appendix B Variation to Standards

- Section A** – Identify the Principal Agency / person commissioning the activity. (Does not include contractors, subcontractors or traffic management company/traffic planners etc).
  - Section B** – Identify activity location, start / finish date and time, type of traffic management, description location of activity.
  - Section C** – Identify the person that has prepared the Traffic Management Plan, this person shall have AWTM accreditation.
  - Section D** – For Works undertaken on a State road or on behalf of Main Roads Western Australia the details of the risk assessment process identified in this application form must be documented and endorsed<sup>1</sup> by an accredited Roadworks Traffic Manager.  
All applications to be addressed to the applicable Main Roads Regional office. For contact information please refer to the online Application kits and guidelines to undertake works. ([www.mainroads.wa.gov.au](http://www.mainroads.wa.gov.au) >Our Roads > Conducting Works on Roads).
- For all other applications the details of the risk assessment process identified in this application form must be documented and endorsed<sup>1</sup> by the person responsible for approving the traffic management plan.
- Contact with the appropriate road authority should be made prior to lodgement of this application to determine its suitability and for any additional requirements.
- Section E** - Risk implication<sup>2</sup>, identification and assessment process must be undertaken in accordance with Risk Management – Principles and Guidelines AS/NZS ISO 31000. The likelihood and consequences should be rated after the application of any additional counter measures taken utilising Tables from Annexure's 202B and 203B, Main Roads WA - Specification 202 and 203 respectively.
  - Incomplete or applications not signed<sup>1</sup>** by the RTM will not be processed.

A	Applicant (Principal for the Works)					
	Postal address					
	Suburb		State		Postcode	
	Project Manager		Telephone			
	Email	Facsimile				

B	Anticipated start date				Anticipated finish date				
	Daily work hours; From			To		Weekend work applicable		Yes <input type="checkbox"/> Sat <input type="checkbox"/> Sun <input type="checkbox"/> No <input type="checkbox"/>	
	Location of works (Road/Street Suburb),								
	Road type (eg undivided, two lane)								
	Description of works								
	Are alterations to permanent traffic signals required?				Yes <input type="checkbox"/>		No <input type="checkbox"/>		N/A <input type="checkbox"/>
	Posted Speed Limit			Worksite speed limit			After hours speed limit		

C	TMP Designer							
	Accreditation Number							
	Postal address							
	Suburb		State		Postcode			
	Email		Telephone		Facsimile			
	Endorsement signature						Date	

## TRAFFIC MANAGEMENT PLAN

D	RTM Endorsing Variation					
	Accreditation Number					
	Postal address					
	Suburb		State		Postcode	
	Email		Telephone		Facsimile	
	Endorsement signature <sup>1</sup>			Date		

For Internal Use Only					
Approving Road Authority					
Approving Officer Position					
Application Approved	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If Not Why Not		
Additional Conditions					
Approved By: Signature		Title		Date	File

## Appendix C – Record Forms

### Daily Diary

Record details of all changes to the Traffic Management Plan.

PROJECT DETAILS:

LOCATION:

DATE:

Contract No.

TMP Document No.

TCD Dwg No.

Revision No. 0

Date:		Time:	Location:			
Inspection/ changes	By:	Signed:	Changes authorised	By:	Signed:	
Detail/Comments:						

Date:		Time:	Location:			
Inspection/ changes	By:	Signed:	Changes authorised	By:	Signed:	
Detail/Comments:						

Date:		Time:	Location:			
Inspection/ changes	By:	Signed:	Changes authorised	By:	Signed:	
Detail/Comments:						

## TRAFFIC MANAGEMENT PLAN

### Daily Inspection Sheet.

TRAFFIC MANAGEMENT - DAILY INSPECTION SHEET		DATE:	<u>TCD NO(S).</u>
<b>Inspection Prior to Commencement of Work</b>		<b>Day Time Inspection During Work Hours</b>	
<b>Time of Inspection:</b>		<b>Time of Inspection:</b>	
Signs & devices appropriate for the day's activities and conditions	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Modifications / Repairs Required	Signs & devices operating satisfactorily and seen by motorists	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Modifications / Repairs Required
Signs & devices positioned and mounted correctly	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Modifications / Repairs Required	Signs & devices positioned and mounted correctly	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Modifications / Repairs Required
Signs & devices clean and clearly visible	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Modifications / Repairs Required	Signs & devices clean and clearly visible	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Modifications / Repairs Required
Modifications and/or repairs completed	<input type="checkbox"/> Yes (Give details) <input type="checkbox"/> No (If no, give reason)	Traffic Controllers correctly attired and operating correctly	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Modifications / Repairs Required
		Modifications and/or repairs completed	Yes (Give details) No / Not Applicable (Give reason)



**TRAFFIC MANAGEMENT PLAN**

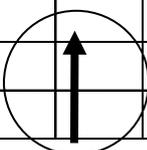
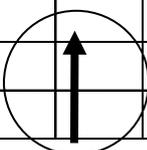
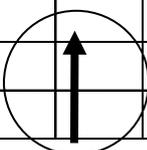
**Incident Report Form.**

Any incident occurring onsite shall be reported using the following incident report format.

Region	Incident Report No.
Contract Number	Contractor

Major Incident Reports must be forwarded to the Superintendent within 48 hours of the incident occurring or becoming apparent.

Contractors shall use this Form for reporting of Traffic incidents on works under Contract and this form supplements the OSH Incident Reporting Form.

<b>A Details of Incident</b>		Reported to: <input type="checkbox"/> Supervisor <input type="checkbox"/> TMR <input type="checkbox"/> Other																																				
OSH Incident Report No					Atmospheric Conditions		Light Conditions																															
Fatality	<input type="checkbox"/>				Clear	<input type="checkbox"/>	Day Light	<input type="checkbox"/>																														
Injury	<input type="checkbox"/>	<b>Road Surface</b>			Overcast	<input type="checkbox"/>	Night Time	<input type="checkbox"/>																														
Property Damage	<input type="checkbox"/>	Unsealed	<input type="checkbox"/>	Raining	<input type="checkbox"/>	Dawn/Dusk	<input type="checkbox"/>																															
Police Attended	Yes/No	Sealed	<input type="checkbox"/>	Fog/Smoke/Dust	<input type="checkbox"/>	<b>Street Lighting</b>																																
Time and Date of incident		<b>AM / PM</b>			<b>Road Condition</b>		On		<input type="checkbox"/>																													
		Day	Month	Year	Wet	<input type="checkbox"/>	Off		<input type="checkbox"/>																													
					Dry	<input type="checkbox"/>	Not Provided		<input type="checkbox"/>																													
Other relevant details, (Last maintenance grade, watering and dust conditions):																																						
<b>B Details of Traffic Management in place:</b>																																						
TCD No:					Name of individual that prepared the TCD																																	
Time last inspected:					Accreditation No:																																	
TCD Approved:		Day	Month	Year	TMP Approved:		Day	Month	Year																													
<b>C Descriptions of Vehicles:</b>																																						
Detail (make, model/ped/cyclist/VRU)				Registration No		Direction of Travel		Age of Driver																														
Vehicle 1																																						
Vehicle 2																																						
Vehicle 3																																						
Comments:																																						
<b>D Description of Incident:</b>																																						
Draw the incident including the direction of travel, traffic control signs, fixed structures and north point.																																						
<table border="1" style="width: 100%; height: 100px; border-collapse: collapse;"> <tr> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">  </td> <td></td> </tr> <tr> <td></td> </tr> </table>																																						
																																						



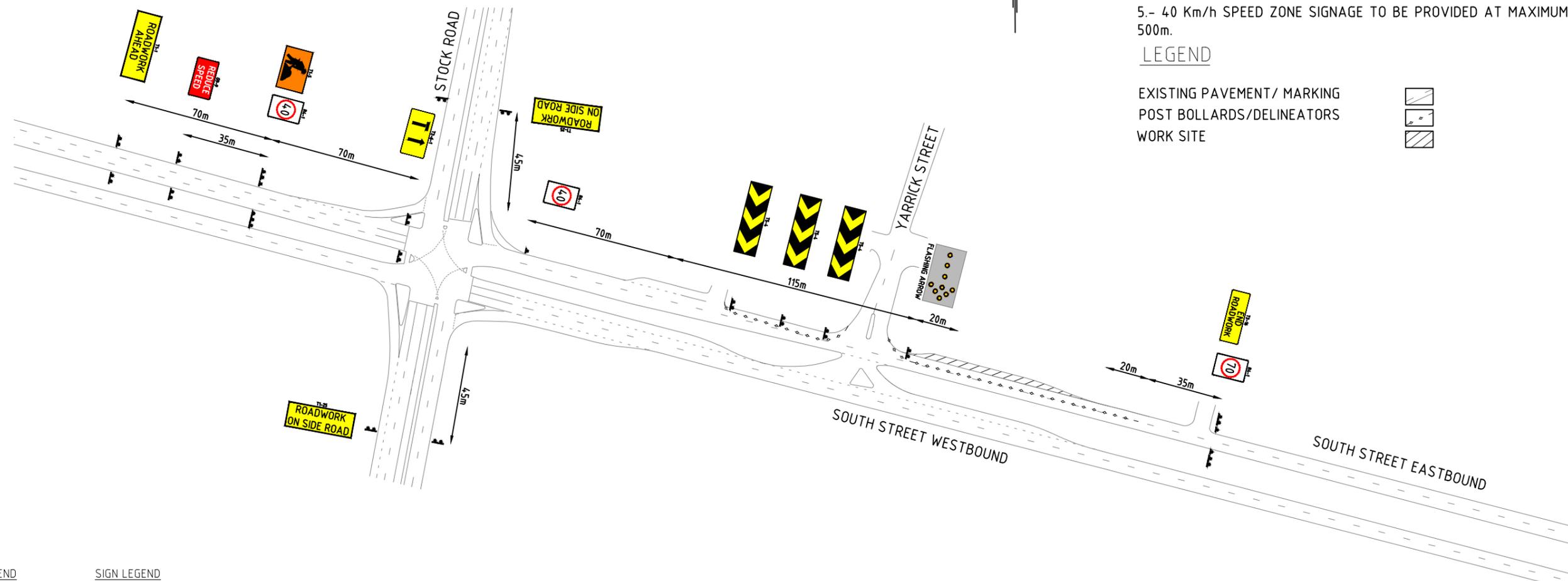
Appendix D Traffic Control Diagrams.

**NOTES**

1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
2. - THE SYMBOLIC WORKER SIGNS WHICH SHALL BE INSTALLED ONLY DURING HOURS WHEN ON-FOOT PERSONNEL WILL BE VISIBLE TO PASSING TRAFFIC.
3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.
- 5.- 40 Km/h SPEED ZONE SIGNAGE TO BE PROVIDED AT MAXIMUM SPACING OF 500m.

**LEGEND**

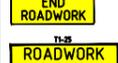
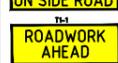
- EXISTING PAVEMENT/ MARKING 
- POST BOLLARDS/DELINEATORS 
- WORK SITE 



**SIGN LEGEND**

SIGN	NO
	2
	2
	3
	2
	2
	1

**SIGN LEGEND**

SIGN	NO
	4
	1
	2
	4
	2

CONE SPACING PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.	Low speed	4
Merge tapers	Low speed	4
Diverge tapers	Low speed	4

No.	DATE	DESCRIPTION	APPR.
B	08.08.14	MRWA AMENDMENTS	
A	06.05.14	GENERAL AMENDMENTS	RG
-	04.02.14	FOR CLIENT REVIEW	RG
AMENDMENTS			



**mainroads**  
WESTERN AUSTRALIA

Client  
**MAIN ROADS WA**

Scale NTS
Date 08/08/2014

Title  
**WIDENING EASTBOUND CARRIAGEWAY  
STAGE 1 BUS BAY NORTH SIDE  
WORKS WITHIN 1.2m OF NEAREST OPEN TRAFFIC LANE**

SHEET 1 OF 1

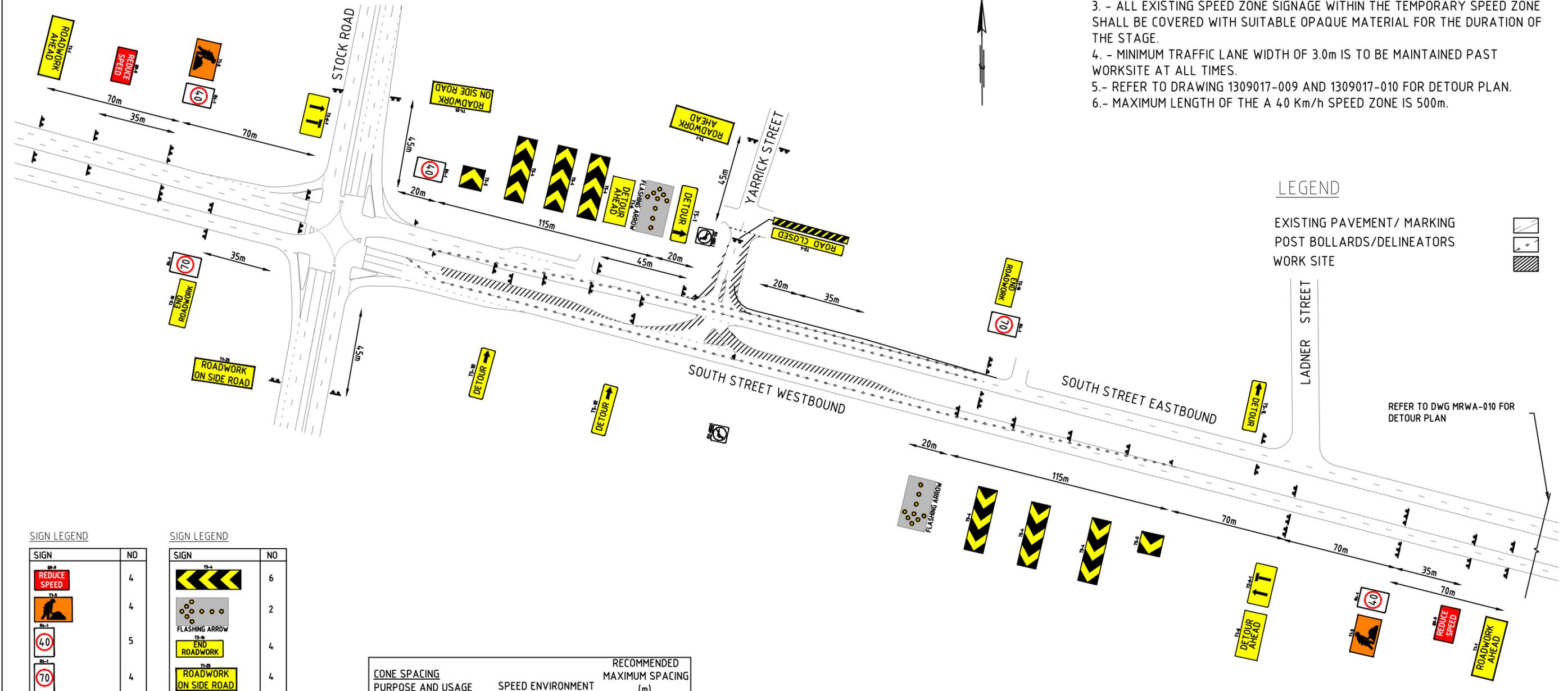
Dwg No. MRWA-001
Rev. B

**NOTES**

1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
2. - THE SYMBOLIC WORKER SIGNS WHICH SHALL BE INSTALLED ONLY DURING HOURS WHEN ON-FOOT PERSONNEL WILL BE VISIBLE TO PASSING TRAFFIC.
3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.
5. - REFER TO DRAWING 1309017-009 AND 1309017-010 FOR DETOUR PLAN.
6. - MAXIMUM LENGTH OF THE A 40 Km/h SPEED ZONE IS 500m.

**LEGEND**

- EXISTING PAVEMENT/ MARKING
- POST BOLLARDS/DELINEATORS
- WORK SITE



**SIGN LEGEND**

SIGN	NO
	4
	4
	5
	4
	4
	1
	1
	2
	1

**SIGN LEGEND**

SIGN	NO
	6
	2
	4
	4
	6
	1
	2
	1
	2

CONE SPACING PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.	Low speed	4
Merge tapers	Low speed	4
Diverge tapers	Low speed	4

No.	DATE	DESCRIPTION	APPR.
C	08.8.14	MRWA AMENDMENTS	
B	06.05.14	GENERAL AMENDMENTS	RG
A	14.01.14	GENERAL AMENDMENTS	RG
-	28.11.13	FOR CLIENT REVIEW	RG
AMENDMENTS			

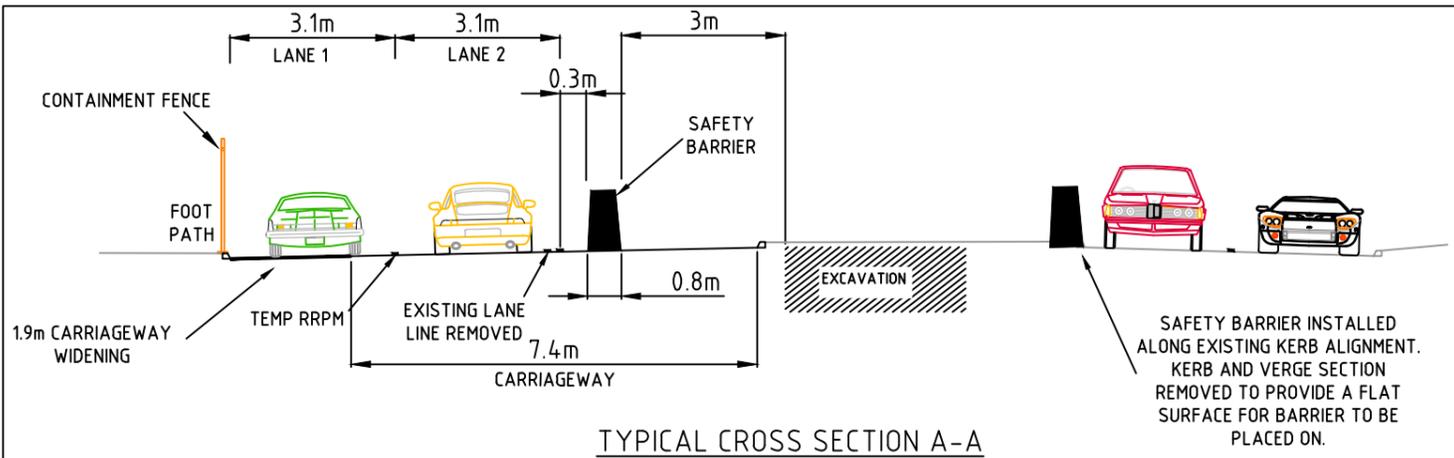
Scale: NTS

Date: 08/8/2014

Client: MAIN ROADS WA

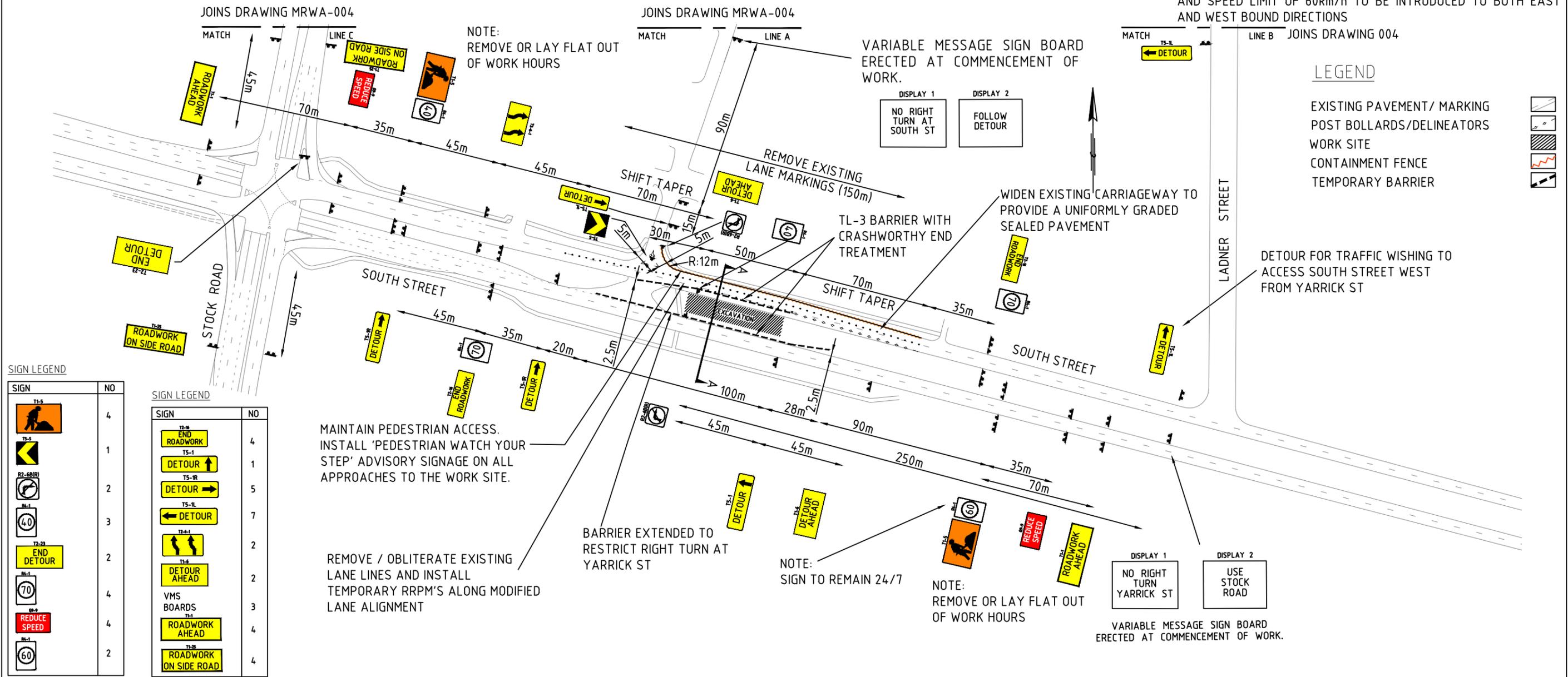
Title: MEDIAN WIDENING WORKS  
STAGE 2  
WORKS WITHIN 1.2m OF NEAREST OPEN TRAFFIC LANE  
SHEET 1 OF 2

Dwg No. MRWA-002
Rev. C



CONE SPACING PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.	Low speed	4
Merge tapers	Low speed	4
Diverge tapers	Low speed	4

- NOTES**
1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
  2. - THE SYMBOLIC WORKER SIGNS WHICH SHALL BE INSTALLED ONLY DURING HOURS WHEN ON-FOOT PERSONNEL WILL BE VISIBLE TO PASSING TRAFFIC.
  3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
  4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.
  5. - MAXIMUM LENGTH OF THE 40 Km/h SPEED ZONE IS 500m.
  6. - WORKERS SYMBOLIC TO BE REMOVED DURING AFTER HOURS AND SPEED LIMIT OF 60km/h TO BE INTRODUCED TO BOTH EAST AND WEST BOUND DIRECTIONS



**SIGN LEGEND**

SIGN	NO
T1-3	4
T1-4	1
R2-60(R)	2
R1-4	3
T2-22	2
R1-1	4
R1-2	4
R1-1	2

**SIGN LEGEND**

SIGN	NO
T2-9	4
T5-1	1
T5-R	5
T5-IL	7
T2-4	2
T1-4	2
VMS BOARDS	3
T1-1	4
T2-9	4

**LEGEND**

EXISTING PAVEMENT/ MARKING	
POST BOLLARDS/ DELINEATORS	
WORK SITE	
CONTAINMENT FENCE	
TEMPORARY BARRIER	

No.	DATE	DESCRIPTION	APPR.
C	08.08.14	MRWA AMENDMENTS	
B	06.05.14	GENERAL AMENDMENTS	RG
A	14.01.14	GENERAL AMENDMENTS	RG
-	28.11.13	FOR CLIENT REVIEW	RG
AMENDMENTS			

**mainroads**  
WESTERN AUSTRALIA

Scale: NTS  
Date: 08/8/2014

Client: MAIN ROADS WA

Title: TEMPORARY BARRIER DESIGN  
MEDIAN SIDE LANE CLOSURE - STAGE 3  
WORKS WITHIN 1.2m OF NEAREST OPEN TRAFFIC LANE

SHEET 1 OF 2

Dwg No.	MRWA-003
Rev.	C

CONE SPACING PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.	Low speed	4
Merge tapers	Low speed	4
Diverge tapers	Low speed	4

**LEGEND**

- EXISTING PAVEMENT/ MARKING
- POST BOLLARDS/DELINEATORS
- WORK SITE
- CONTAINMENT FENCE
- TEMPORARY BARRIER



**NOTES**

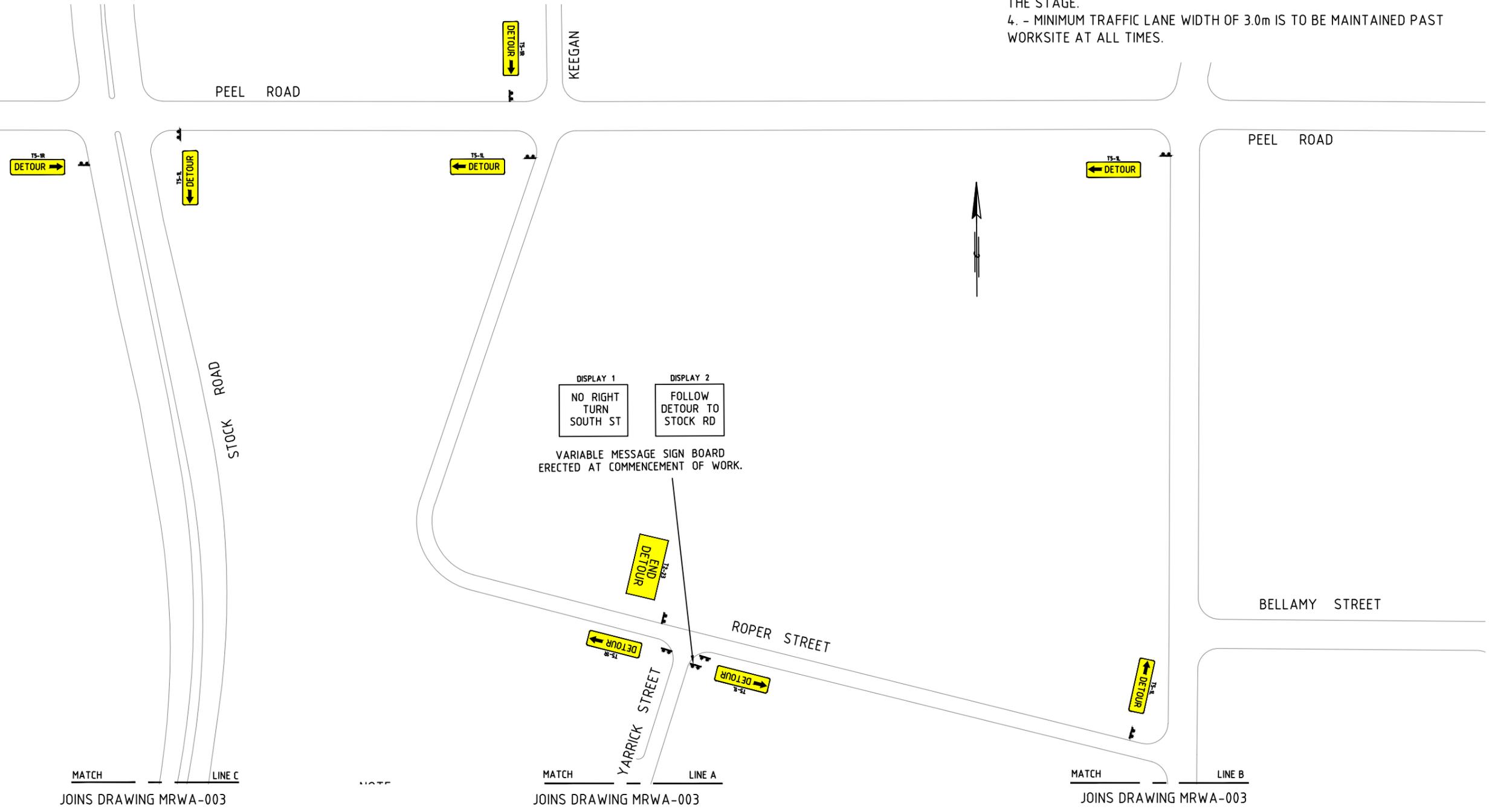
1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
2. - THE SYMBOLIC WORKER SIGNS WHICH SHALL BE INSTALLED ONLY DURING HOURS WHEN ON-FOOT PERSONNEL WILL BE VISIBLE TO PASSING TRAFFIC.
3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.

**SIGN LEGEND**

SIGN	NO
	4
	1
	5
	7
	2
	2
VMS BOARDS	3
	4
	4

**SIGN LEGEND**

SIGN	NO
	4
	1
	2
	3
	2
	4
	4
	2



No.	DATE	DESCRIPTION	APPR.
B	08.08.14	GENERAL AMENDMENTS	RG
A	14.01.14	GENERAL AMENDMENTS	RG
-	28.11.13	FOR CLIENT REVIEW	RG
AMENDMENTS			

Client  
**MAIN ROADS WA**

Scale NTS
Date 08/08/2014

**DETOUR**  
**STAGE 3**  
 WORKS WITHIN 1.2m OF NEAREST OPEN TRAFFIC LANE  
 SHEET 2 OF 2

Dwg No. MRWA-004
Rev. B

**NOTES**

1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
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3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.
- 5.- 40 Km/h SPEED ZONE SIGNAGE TO BE PROVIDED AT MAXIMUM SPACING OF 500m.

**LEGEND**

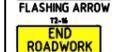
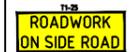
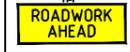
- EXISTING PAVEMENT/ MARKING 
- POST BOLLARDS/DELINEATORS 
- WORK SITE 



**SIGN LEGEND**

SIGN	NO
	2
	2
	3
	2
	2
	1

**SIGN LEGEND**

SIGN	NO
	4
	1
	2
	4
	2

CONE SPACING	PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.		Low speed	4
Merge tapers		Low speed	4
Diverge tapers		Low speed	4

No.	DATE	DESCRIPTION	APPR.
B	08.08.14	MRWA AMENDMENTS	
A	06.05.14	GENERAL AMENDMENTS	RG
-	04.02.14	FOR CLIENT REVIEW	RG
AMENDMENTS			



Client  
MAIN ROADS WA

Scale NTS
Date 08/08/2014

Title  
STAGE 4 BUS BAY NORTH SIDE  
WORKS WITHIN 1.2m OF NEAREST OPEN TRAFFIC LANE  
SHEET 1 OF 1

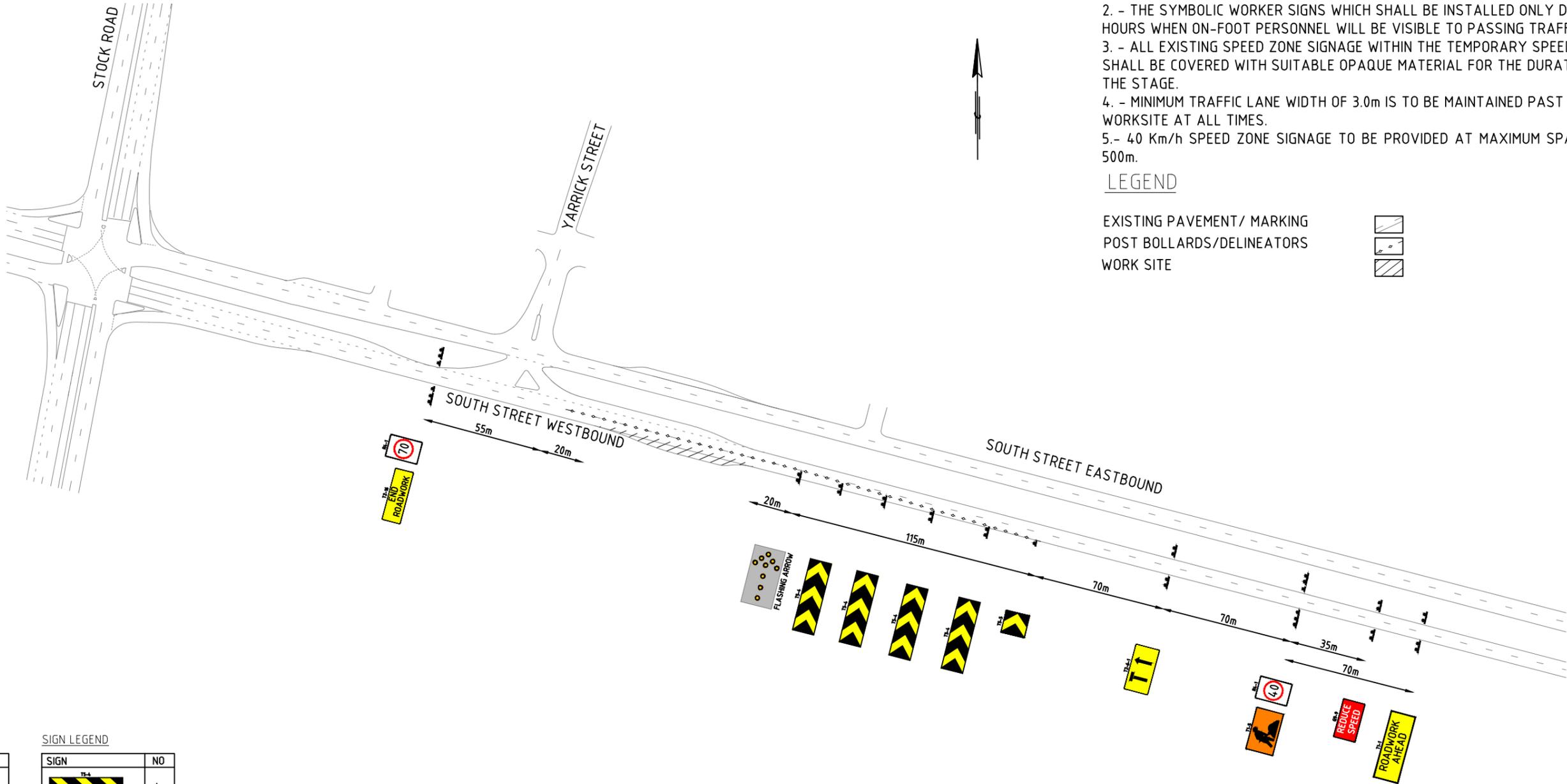
Dwg No. MRWA-005
Rev. B

**NOTES**

- 1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
- 2. - THE SYMBOLIC WORKER SIGNS WHICH SHALL BE INSTALLED ONLY DURING HOURS WHEN ON-FOOT PERSONNEL WILL BE VISIBLE TO PASSING TRAFFIC.
- 3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
- 4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.
- 5.- 40 Km/h SPEED ZONE SIGNAGE TO BE PROVIDED AT MAXIMUM SPACING OF 500m.

**LEGEND**

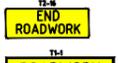
- EXISTING PAVEMENT/ MARKING 
- POST BOLLARDS/DELINEATORS 
- WORK SITE 



**SIGN LEGEND**

SIGN	NO
	2
	2
	2
	2
	2

**SIGN LEGEND**

SIGN	NO
	4
	1
	2
	2
	1

CONE SPACING PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.	Low speed	4
Merge tapers	Low speed	4
Diverge tapers	Low speed	4

No.	DATE	DESCRIPTION	APPR.
A	08.08.14	GENERAL AMENDMENTS	RG
-	04.02.14	FOR CLIENT REVIEW	RG
AMENDMENTS			



**mainroads**  
WESTERN AUSTRALIA

Client  
**MAIN ROADS WA**

Scale: NTS

Date: 08.08.14

Title

**STAGE 5 BUS BAY SOUTH SIDE**  
**WORKS WITHIN 1.2m OF NEAREST OPEN TRAFFIC LANE**

SHEET 1 OF 1

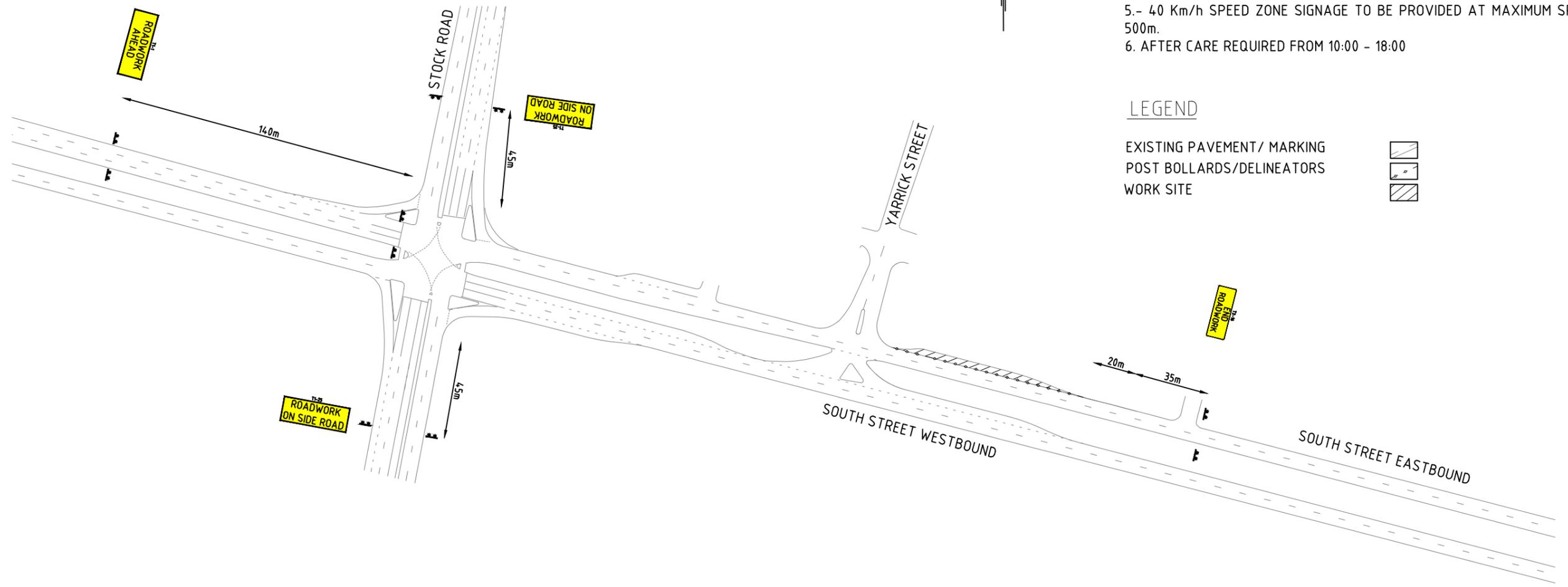
Dwg No. <b>MRWA-006</b>
Rev. <b>A</b>

**NOTES**

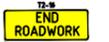
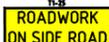
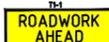
1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
2. - THE SYMBOLIC WORKER SIGNS WHICH SHALL BE INSTALLED ONLY DURING HOURS WHEN ON-FOOT PERSONNEL WILL BE VISIBLE TO PASSING TRAFFIC.
3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.
- 5.- 40 Km/h SPEED ZONE SIGNAGE TO BE PROVIDED AT MAXIMUM SPACING OF 500m.
6. AFTER CARE REQUIRED FROM 10:00 - 18:00

**LEGEND**

- EXISTING PAVEMENT/ MARKING 
- POST BOLLARDS/DELINEATORS 
- WORK SITE 



**SIGN LEGEND**

SIGN	NO
	2
	4
	2

CONE SPACING PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.	Low speed	4

No.	DATE	DESCRIPTION	APPR.
B	8.08.14	MRWA AMENDMENTS	
A	06.05.14	GENERAL AMENDMENTS	RG
-	04.02.14	FOR CLIENT REVIEW	RG
AMENDMENTS			



Client  
**MAIN ROADS WA**

Scale NTS
Date 8/08/2014

Title  
**MEDIAN WIDENING WORKS  
STAGE 1 AND STAGE 4  
AFTER CARE  
SHEET 1 OF 1**

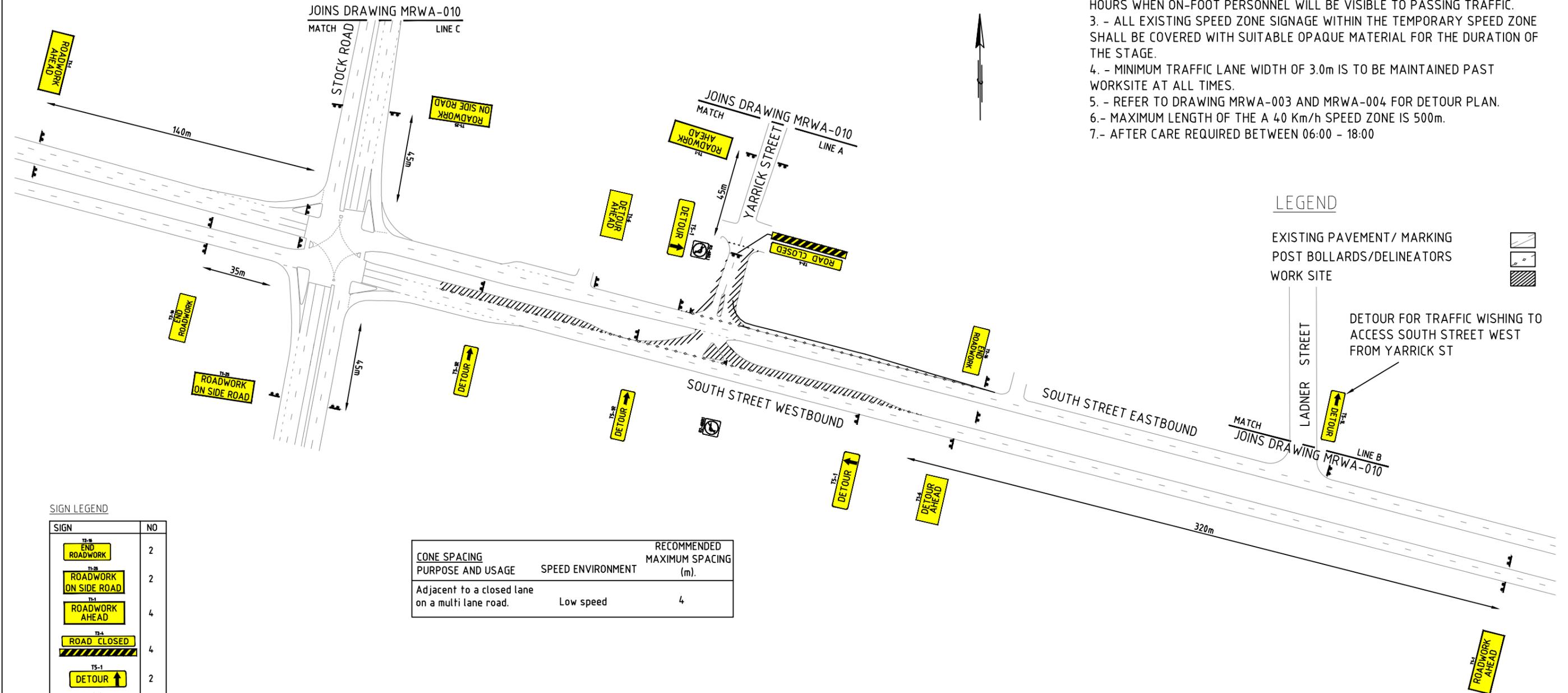
Dwg No. MRWA-008
Rev. B

**NOTES**

1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
2. - THE SYMBOLIC WORKER SIGNS WHICH SHALL BE INSTALLED ONLY DURING HOURS WHEN ON-FOOT PERSONNEL WILL BE VISIBLE TO PASSING TRAFFIC.
3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.
5. - REFER TO DRAWING MRWA-003 AND MRWA-004 FOR DETOUR PLAN.
- 6.- MAXIMUM LENGTH OF THE A 40 Km/h SPEED ZONE IS 500m.
- 7.- AFTER CARE REQUIRED BETWEEN 06:00 - 18:00

**LEGEND**

- EXISTING PAVEMENT/ MARKING
- POST BOLLARDS/DELINEATORS
- WORK SITE



**SIGN LEGEND**

SIGN	NO
	2
	2
	4
	4
	2
	2
	2
	1
	1
	1

CONE SPACING PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.	Low speed	4

No.	DATE	DESCRIPTION	APPR.
C	8.08.14	MRWA AMENDMENTS	
B	06.05.14	GENERAL AMENDMENTS	RG
A	14.01.14	GENERAL AMENDMENTS	RG
-	28.11.13	FOR CLIENT REVIEW	RG
AMENDMENTS			

Client  
**MAIN ROADS WA**

Scale NTS
Date 8/08/2014

Title  
**MEDIAN WIDENING WORKS  
STAGE 2  
AFTER CARE  
SHEET 1 OF 2**

Dwg No. <b>MRWA-009</b>
Rev. <b>C</b>

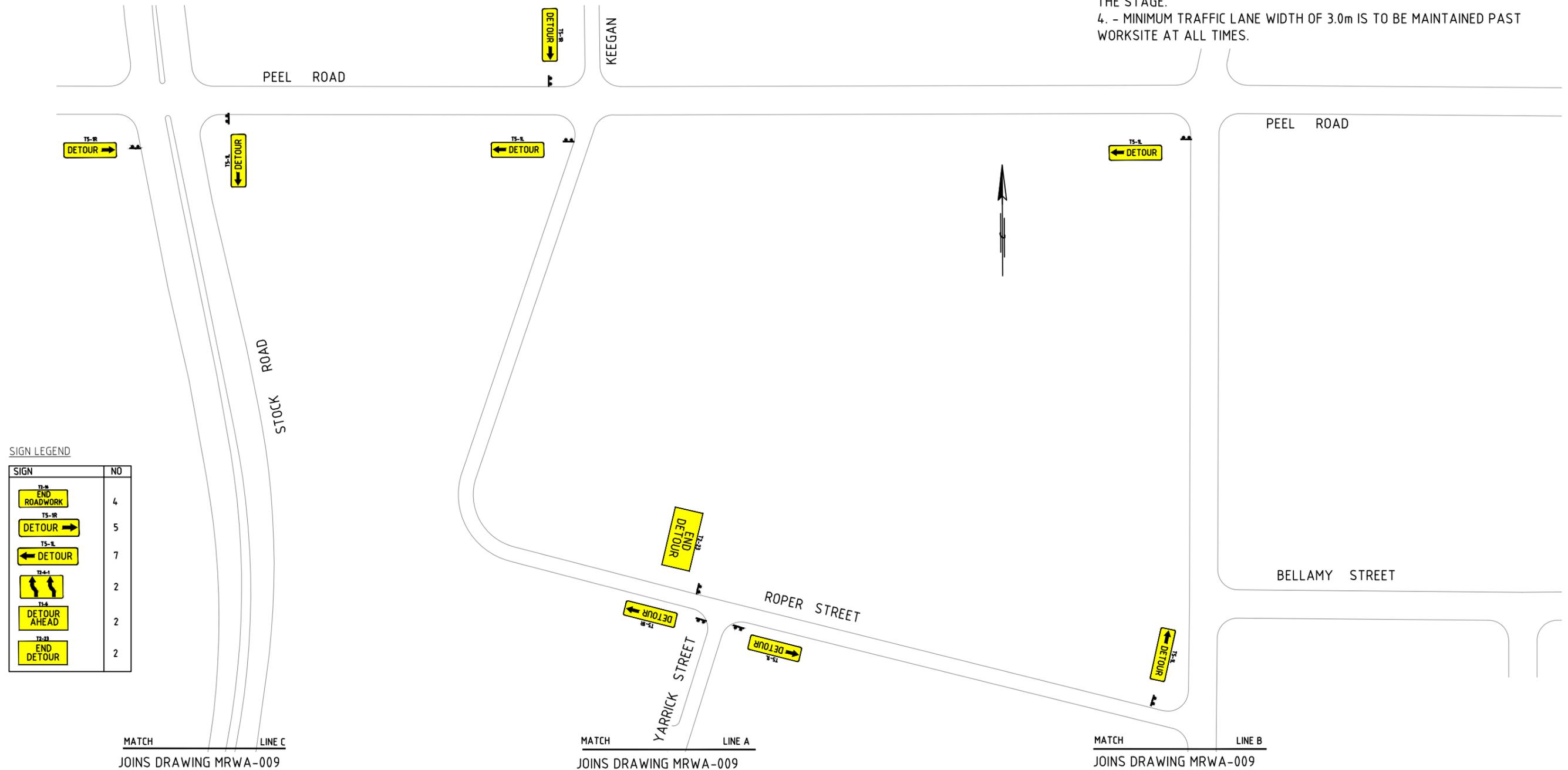
**LEGEND**

- EXISTING PAVEMENT/ MARKING
- POST BOLLARDS/DELINEATORS
- WORK SITE
- CONTAINMENT FENCE
- TEMPORARY BARRIER



**NOTES**

1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
2. - THE SYMBOLIC WORKER SIGNS WHICH SHALL BE INSTALLED ONLY DURING HOURS WHEN ON-FOOT PERSONNEL WILL BE VISIBLE TO PASSING TRAFFIC.
3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.



**SIGN LEGEND**

SIGN	NO
	4
	5
	7
	2
	2
	2

No.	DATE	DESCRIPTION	APPR.
C	08.08.14	MRWA AMENDMENTS	
B	06.05.14	GENERAL AMENDMENTS	RG
A	14.01.14	GENERAL AMENDMENTS	RG
-	28.11.13	FOR CLIENT REVIEW	RG
AMENDMENTS			

**mainroads**  
WESTERN AUSTRALIA

Client  
**MAIN ROADS WA**

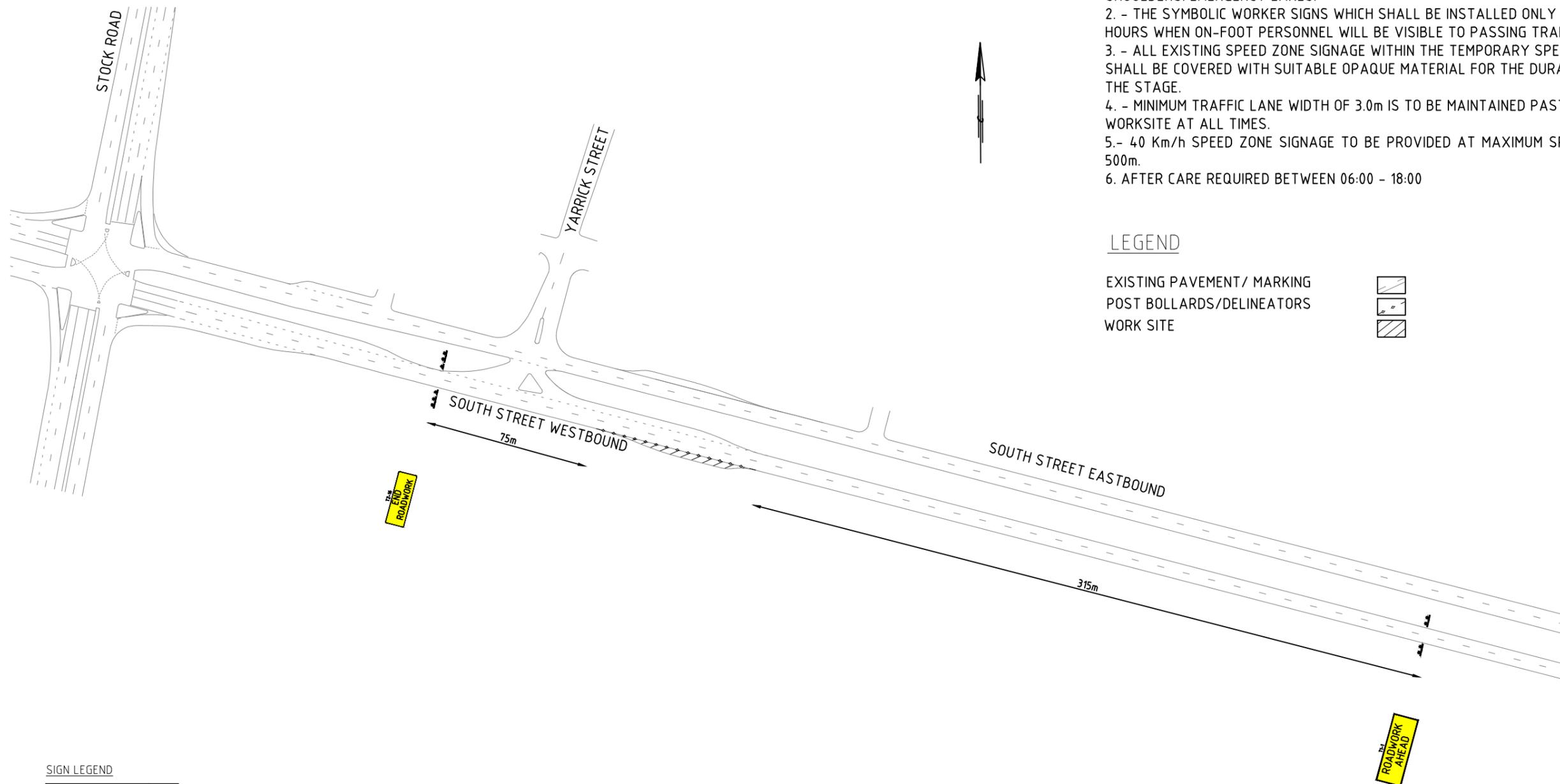
Scale NTS
Date 8/08/2014

Title

**DETOUR PLAN  
STAGE 2**

SHEET 2 OF 2

Dwg No. <b>MRWA-010</b>
Rev. <b>C</b>



**NOTES**

1. - ALL SIGN LOCATIONS ARE TO BE CHECKED PRIOR TO SETOUT AND POSITIONS ADJUSTED TO ALLOW FOR SPECIFIC SITE CONSTRAINTS SUCH AS VEGETATION, OTHER SIGNS, ROADSIDE FURNITURE AND SUFFICIENT SPACE ON SHOULDERS/EMERGENCY LANES.
2. - THE SYMBOLIC WORKER SIGNS WHICH SHALL BE INSTALLED ONLY DURING HOURS WHEN ON-FOOT PERSONNEL WILL BE VISIBLE TO PASSING TRAFFIC.
3. - ALL EXISTING SPEED ZONE SIGNAGE WITHIN THE TEMPORARY SPEED ZONE SHALL BE COVERED WITH SUITABLE OPAQUE MATERIAL FOR THE DURATION OF THE STAGE.
4. - MINIMUM TRAFFIC LANE WIDTH OF 3.0m IS TO BE MAINTAINED PAST WORKSITE AT ALL TIMES.
- 5.- 40 Km/h SPEED ZONE SIGNAGE TO BE PROVIDED AT MAXIMUM SPACING OF 500m.
6. AFTER CARE REQUIRED BETWEEN 06:00 - 18:00

**LEGEND**

- EXISTING PAVEMENT/ MARKING
- POST BOLLARDS/DELINEATORS
- WORK SITE

**SIGN LEGEND**

SIGN	NO
	2
	2

CONE SPACING	PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.		Low speed	4

No.	DATE	DESCRIPTION	APPR.
B	08.08.14	MRWA AMENDMENTS	
A	06.05.14	GENERAL AMENDMENTS	RG
-	04.02.14	FOR CLIENT REVIEW	RG
AMENDMENTS			

Client  
**MAIN ROADS WA**

Scale NTS
Date 08/08/2014

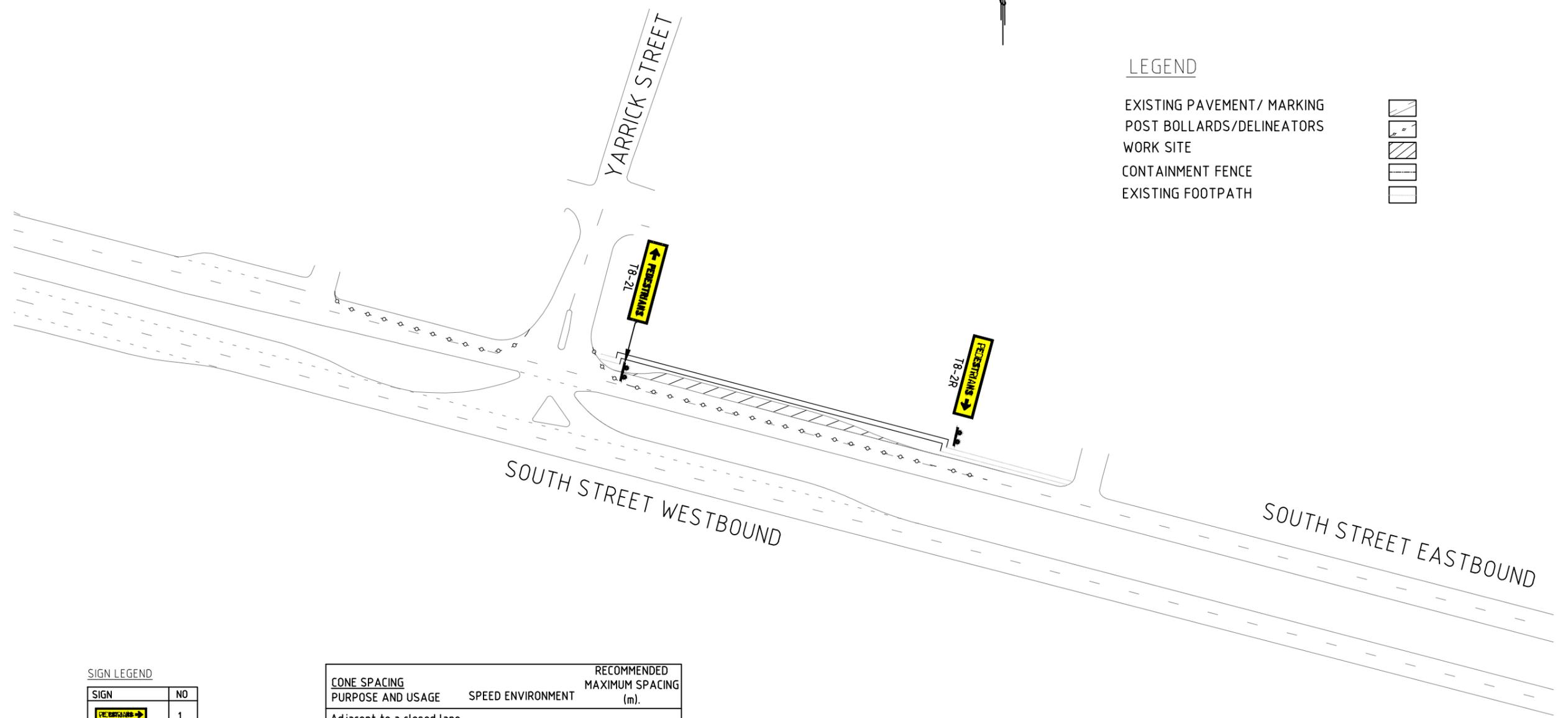
Title  
**STAGE 5 BUS BAY SOUTH SIDE  
AFTER CARE  
SHEET 1 OF 1**

Dwg No. <b>MRWA-011</b>
Rev. <b>B</b>

NOTES

LEGEND

EXISTING PAVEMENT/ MARKING	
POST BOLLARDS/DELINEATORS	
WORK SITE	
CONTAINMENT FENCE	
EXISTING FOOTPATH	



SIGN LEGEND

SIGN	NO
	1
	1

CONE SPACING PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.	Low speed	4
Merge tapers	Low speed	4
Diverge tapers	Low speed	4

No.	DATE	DESCRIPTION	APPR.
-	28.08.14	MRWA	RG
AMENDMENTS			

  
 Client  
**MAIN ROADS WA**

Scale NTS
Date 28/08/2014

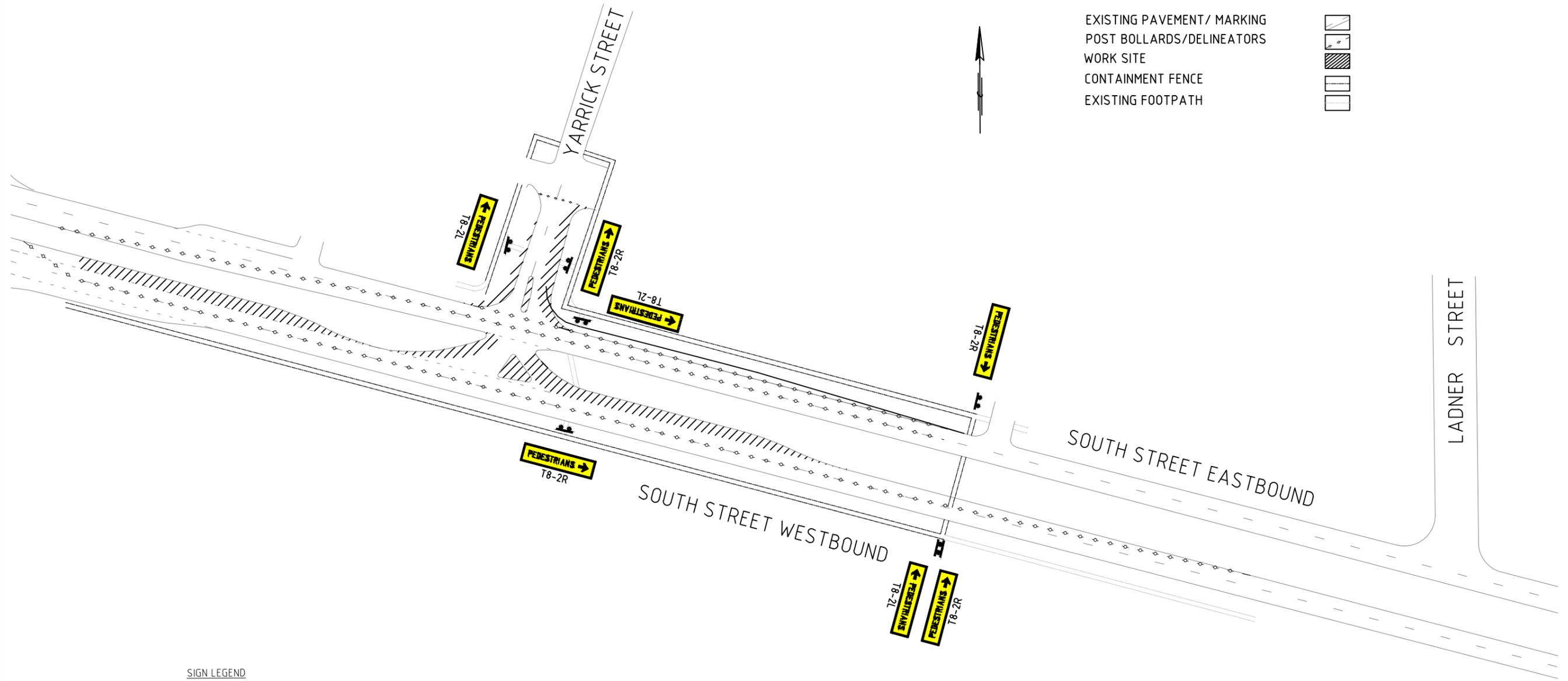
Title  
**PEDESTRIAN MANAGEMENT  
 STAGE 1 AND STAGE 4 BUS BAY NORTH SIDE  
 WORKS WITHIN 1.2m OF NEAREST OPEN TRAFFIC LANE**  
 SHEET 1 OF 1

Dwg No. MRWA-012
Rev. A

NOTES

LEGEND

- EXISTING PAVEMENT/ MARKING 
- POST BOLLARDS/DELINEATORS 
- WORK SITE 
- CONTAINMENT FENCE 
- EXISTING FOOTPATH 



SIGN LEGEND

SIGN	NO
	4
	3

CONE SPACING PURPOSE AND USAGE	SPEED ENVIRONMENT	RECOMMENDED MAXIMUM SPACING (m).
Adjacent to a closed lane on a multi lane road.	Low speed	4
Merge tapers	Low speed	4
Diverge tapers	Low speed	4

No.	DATE	DESCRIPTION	APPR.
-	28.08.14	MRWA	
AMENDMENTS			



**mainroads**  
WESTERN AUSTRALIA

Client  
**MAIN ROADS WA**

Scale NTS
Date 08/8/2014

Title

**PEDESTRIAN MANAGEMENT  
STAGE 2  
WORKS WITHIN 1.2m OF NEAREST OPEN TRAFFIC LANE  
SHEET 1 OF 1**

Dwg No. MRWA-013
Rev. A



**South Street**

120 mm Text Height

Sign to be located 130 m in advance of works on South Street in both East and West directions.

**Yarrick Street**

93 mm Text Height

Sign to be located 95 m in advanced of works on Yarrick Street south of the intersection with South Street.

## Appendix E – Traffic Analysis

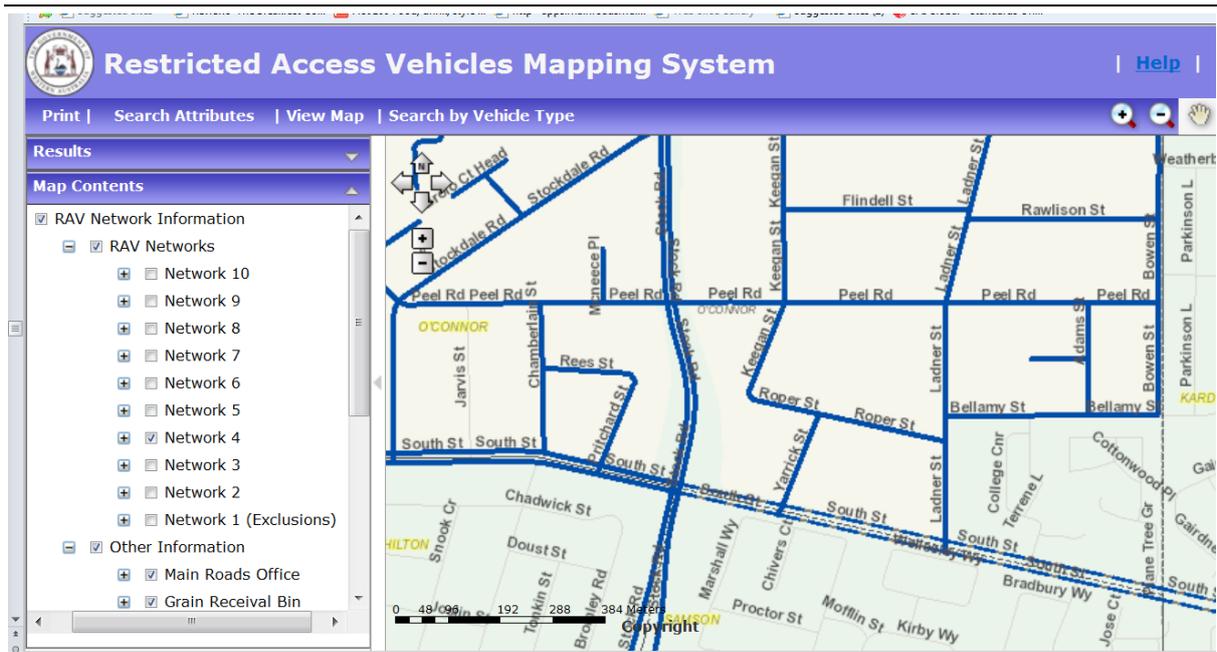
Existing intersection performance – PM peak hour South Street – Stock Road.

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow	HV Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%			v/c	sec				Vehicles
South: Stock Road											
1	L	105	0.0	0.304	65.8	LOS E	6.4	44.9	0.94	0.77	21.3
2	T	697	0.0	0.887	71.8	LOS E	25.6	179.0	1.00	0.99	19.5
3	R	126	0.0	0.366	66.2	LOS E	7.8	54.5	0.95	0.78	21.3
Approach		928	0.0	0.887	70.3	LOS E	25.6	179.0	0.99	0.94	20.0
East: South Street											
4	L	158	0.0	0.483	51.7	LOS D	8.4	58.7	0.83	0.78	24.7
5	T	1263	0.0	0.893	61.3	LOS E	45.1	316.0	1.00	0.98	21.6
6	R	158	0.0	0.483	51.5	LOS D	8.4	58.7	0.83	0.77	24.9
Approach		1579	0.0	0.893	59.3	LOS E	45.1	316.0	0.97	0.94	22.1
North: Stock Road											
7	L	105	0.0	0.279	56.0	LOS E	5.8	40.7	0.86	0.77	23.6
8	T	1053	0.0	0.893	65.6	LOS E	38.2	267.4	1.00	0.99	20.7
9	R	105	0.0	0.279	55.8	LOS E	5.8	40.7	0.86	0.76	23.7
Approach		1263	0.0	0.893	64.0	LOS E	38.2	267.4	0.98	0.95	21.1
West: South Street											
10	L	105	0.0	0.279	56.0	LOS E	5.8	40.7	0.86	0.77	23.6
11	T	1053	0.0	0.893	65.6	LOS E	38.2	267.4	1.00	0.99	20.7
12	R	105	0.0	0.279	55.8	LOS E	5.8	40.7	0.86	0.76	23.7
Approach		1263	0.0	0.893	64.0	LOS E	38.2	267.4	0.98	0.95	21.1
All Vehicles		5034	0.0	0.893	63.7	LOS E	45.1	316.0	0.98	0.95	21.2

Intersection performance – typical hour South Street – Stock Road under lane closure.

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow	HV Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%			v/c	sec				Vehicles
South: Stock Road											
1	L	80	0.0	0.175	38.8	LOS D	2.7	18.8	0.89	0.75	29.0
2	T	530	0.0	0.858	40.6	LOS D	17.6	123.5	0.98	0.97	27.1
3	R	96	0.0	0.209	38.8	LOS D	3.3	22.8	0.90	0.76	29.1
Approach		706	0.0	0.858	40.1	LOS D	17.6	123.5	0.96	0.92	27.6
East: South Street											
4	L	120	0.0	0.249	37.3	LOS D	4.0	27.7	0.88	0.77	29.6
5	T	960	0.0	0.873	40.5	LOS D	20.8	145.6	1.00	1.02	27.1
6	R	120	0.0	0.857	46.5	LOS D	4.7	32.6	0.88	0.91	26.4
Approach		1200	0.0	0.873	40.8	LOS D	20.8	145.6	0.98	0.99	27.3
North: Stock Road											
7	L	80	0.0	0.188	39.8	LOS D	2.7	19.2	0.90	0.75	28.6
8	T	800	0.0	0.895	44.5	LOS D	18.0	126.0	1.00	1.06	25.8
9	R	80	0.0	0.188	39.5	LOS D	2.7	19.2	0.90	0.75	28.8
Approach		960	0.0	0.895	43.7	LOS D	18.0	126.0	0.98	1.01	26.3
West: South Street											
10	L	80	0.0	0.188	39.8	LOS D	2.7	19.2	0.90	0.75	28.6
11	T	800	0.0	0.895	44.5	LOS D	18.0	126.0	1.00	1.06	25.8
12	R	80	0.0	0.188	39.5	LOS D	2.7	19.2	0.90	0.75	28.8
Approach		960	0.0	0.895	43.7	LOS D	18.0	126.0	0.98	1.01	26.3
All Vehicles		3826	0.0	0.895	42.1	LOS D	20.8	145.6	0.98	0.98	26.8

# TRAFFIC MANAGEMENT PLAN



Appendix F – Barrier Design

South Street Temporary Barrier		Barrier type Barrier Guard 800 with Quadguard CZ Terminal	
BARRIER DESIGN		Value	Notation
Traffic Volume		14000	AADT
Speed zone		50	V
Clear zone		5	La
Offside shyline		1.5	m
Nearside shyline		1	m
Runout length		34	Lr
Barrier inside shyline (I) or outside shyline (O)		I	
Rigid (R) or non rigid (NR)		R	
Flare rate inside shyline	1 in	15	a <sub>1</sub>
Flare rate outside shyline	1 in	10	0
Tangent length		0	L <sub>1</sub>
Length of flare inside shyline		13.5	L <sub>4</sub>
Length of flare outside shyline		11.2	L <sub>5</sub>
Lateral offset of barrier from travelling lane		0.6	L <sub>2</sub>
Length of hazard		20	
Offset of hazard from running lane		1.2	L <sub>3</sub>
Length of need (LON)		24.7	X
Lateral offset from edge of travel lane to LON		2.6	Y
<b>APPROACH END TREATMENT</b>			
Is barrier approach end within clear zone?		n	
Is a terminal to be provided ("Y" or "N")		y	
Additional length of barrier to reach clear zone		0.00	
<b>TRAILING END TREATMENT</b>			
Is trailing end treatment required ("Y" or "N")		n	
Trailing end length		0	
Trailing end lateral offset		0.6	

## Appendix G – Temporary Speed Exemption Request

1. Work Description	<p>The project involves modifications to the road carriageway geometry and median islands at the South Street – Yarrick Street intersection including:</p> <ul style="list-style-type: none"> <li>• Reconstruction and widening of the intersection;</li> <li>• Construction of new bus bays;</li> <li>• Installation of new drainage modules.</li> </ul>
2. Traffic Information	<p>South Street is a Primary Distributer that carries high traffic volume, approximately 30,000 vpd, with up to 7.2 % commercial traffic. It is subject to a 70 km/h speed zone.</p>
3. Exemption Details	<p>It is proposed to have a workzone speed limit of 40 km/h during all stages of the works.</p>
4. Reason for Exemption	<p>The works are to occur during night hours when there is relatively low traffic volume. Due to the complexities of the site, e.g. night works, pedestrian movements, reduced lane widths, merging and detours it is considered safer to reduce the speed to 40 km/h during all stages of work. During hours of high traffic volume all lanes will be open to traffic.</p>
5. Exemption Implications	<p>Using the Main Roads Traffic Calculator a 40 km/h temporary speed limit will not have an adverse impact on the traffic flow for both Eastbound and Westbound carriageways. Lane Closures will not be permitted between 7 am and 6 pm on the EB carriageway and between 10 am and 7 pm on the WB carriageway.</p> <p>It is anticipated the lane closure will have some impact on the performance of the Stock Road and South Street intersection. Additional “green time” for vehicles on South Street approaching the intersection.</p> <p>There will be an extensive communication plan to alert motorists of the possible delays and to select an alternate route.</p>
Traffic Planner and contact	<p>A Designer - 0004 222 2222.</p>
Site Contact	<p>T Controller - 0004 111 111.</p>
Project Manager	<p>P Manager 0004 000 700</p>
Approving Road Authority	<p>Main Roads WA, Road Planned Interventions</p>

## TRAFFIC MANAGEMENT PLAN

Approving Officer	Joe Smith, RPIC
Date	6/04/2017