

**Guideline**

# **Routine Maintenance Guidelines**

**March 2025**



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## 1 Chapter 1: Routine Maintenance and Routine Maintenance delivery

### 1.1 Definitions

Term	Definition
Contract	Means the agreement between the Principal and the Contractor and comprising the documents set out or referred to in the completed RMPC forms.
Contractor	A Local Government (LG), RoadTek or joint venture with local government(s) or RoadTek.
Corporate Priorities	6 priorities identified in corporate level to group all Routine Maintenance defects.
Corporate Weighting	Score allocated to a sub defect based on its impact on road user safety.
Defect(s)	Visible evidence of an undesirable condition in the road infrastructure asset as per Routine Maintenance Intervention Level and Response Time (IL/RT) criteria.
Defect Backlog	Remaining low priority defects, after rectifying the high priority defects, in the current Defect Log.
Defect Code	2-digit code to identify Routine Maintenance defects in the IL/RT criteria.
Defect Log	List of defects identified as per IL/RT criteria during the inspection cycle.
Defect Scoring	Scoring used to prioritise Routine Maintenance defects within corporate priorities excluding hazardous or Principal ordered defects.
Defect Sub Code	4-digit code to group a defect to sub defects based on its severity or dimensions.
Element	A homogeneous component of road, transport or road operation asset identified to manage its lifecycle cost effectively.
Emergency Maintenance	Maintenance Activities undertaken by the Contractor in response to an emergency situation.
Field Weighting	Score allocated to a sub defect based on its impact on asset deterioration.
Initial Intervention Level	The magnitude of a Defect as set out in the Routine Maintenance Guidelines (the Guidelines) Chapter 4 that should be used by the Contractor for recording Defects into the Forward List of Works to assist in work planning.
Intervention Level / Response Time (IL/RT)	As defined in the Guidelines.
Joint Maintenance Requirement Assessment (JMRA)	A joint department / Contractor assessment of the Network for the purpose of determining the extent of Maintenance Activities required for Routine Maintenance for the forthcoming Contract period.
Maintenance Activity(ies)	Describes how a defect is rectified. The work 'Activity' in this document has the same meaning as 'Maintenance Activity.'

Maintenance Activity Standard	<p>The department's requirements for a Maintenance Activity, including:</p> <ul style="list-style-type: none"> <li>• unique reference number (mandatory)</li> <li>• description (mandatory)</li> <li>• applicable specifications</li> <li>• restoration standards</li> <li>• units of measurement (mandatory)</li> <li>• work items (if applicable)</li> <li>• testing requirements</li> <li>• work preparation or work operations details in lieu</li> <li>• work planning, particular points to consider, and</li> <li>• work procedures, particular points to consider or work operations details in lieu.</li> </ul> <p>Note: These Activity Standards are not mandatory requirements (except where indicated) but may be used in preparing the Contractor's Quality Plan. These are detailed in the Guidelines, Chapter 5.</p>
Minor Works	Specific minor enhancement Works, generally preidentified during the JMRA in order to reduce further deterioration of transport infrastructure. The total estimated cost for all minor Works schedules must be less than \$500,000 per year per contract.
Network	State-controlled roads (SCR) included in the Contract.
Response Time	Allocated time to fix a defect where the defect size has reached its upper Intervention Level.
Responsive Maintenance Contract (RMC)	Type of open market contract established in South East Queensland (SEQ) to deliver responsive type of work Routine Maintenance works.
Road Asset Management Contract (RAMC)	Type of open market contract established in South East Queensland (SEQ) to deliver pavement rehabilitation, resurfacing and Routine Maintenance type of works.
Routine Maintenance	Reactive or proactive type of maintenance works, identified based on the IL/RT criteria, carried out on the road corridor to improve road safety, serviceability, usability and to reduce road deterioration.
Road Maintenance Performance Contract (RMPC)	Where the department offers primarily Routine Maintenance Works to its traditional suppliers, Local Government (LG) and RoadTek without any competition from other Contractors.
Site	The nominated Road Network and any other places where the Road Maintenance services, or any part of the Road Maintenance services, are to be carried out.
The Guidelines	Routine Maintenance Guidelines. This document.
Works	Means the whole, or part of, the work to be executed in accordance with the Contract, including variations provided for by the Contract.

## **1.2 Introduction**

Routine Maintenance Guidelines (the Guidelines) provides Routine Maintenance related technical information to use on road Routine Maintenance on Queensland's State-Controlled Road Network (SCRN).

Road conditions across the state differ. Pavement structures, materials, traffic and climate are all important variables that need to be considered when selecting Intervention Level and Response Time (IL/RT). In addition, a balance is required between a safe, efficient road network and responsible maintenance and environmental practice. For these reasons, there are no absolute solutions. The aim of this Guideline is to assist maintenance personnel to apply sensible and appropriate risk-based methods to carry out necessary maintenance actions as per the IL/RT criteria and Maintenance Activity Standards.

Contractors undertaking Road Maintenance Performance Contracts (RMPCs) are required to refer to this Guideline, the *Road Maintenance Performance Contract Manual* (RMPC Manual), C6083 *General Conditions*, C6081 *Invitation to Offer* and their approved Quality Plan for operational requirements.

Road Asset Management Contract (RAMC) and Responsive Maintenance Contract (RMC) providers are also required to use the Guidelines, unless otherwise specified in the contract to deliver Routine Maintenance related works in their contract.

## **1.3 Purpose**

The intention of this Guideline is to provide technical guidance that will assist the maintenance Contractors to consider the various aspects of road maintenance priorities and the use of an effective maintenance program to manage road user safety, road usability, road deterioration, environmental and legislative requirements. An effective and efficient maintenance program can be achieved by following the RMPC process explained in the RMPC Manual.

This Guideline shall apply to the maintenance of a Network by a Contractor for the Department of Transport and Main Roads under RMPC Manual, *Road Asset Management Contract* (RAMC) and for any other form of contract if it is established.

The purpose of this Guideline is to provide required technical standards and guidance to deliver consistent Routine Maintenance across the state.

As such, this Guideline will contribute to the management of processes to achieve value for money maintenance delivery, and to make informed business decisions.

## **1.4 Scope**

The procedures and requirements for the following types of maintenance are described in this Guideline and the RMPC:

- Routine Maintenance
  - Routine Maintenance work activities identified as per IL/RT.

- Minor Works
  - Maintenance Works that are beyond the Routine Maintenance scope, however, may not be identified as other Element Works such as Programmed Maintenance Works or Rehabilitation Works due to the size of the defect. Repair of such defects will improve pavement life and reduce pavement deterioration. Therefore, it is recommended to fix these defects under RMPC as a Routine Maintenance Minor Works Scheme.
- Emergency Maintenance
  - Activities are undertaken in response to an emergency situation on the Road Network.

### **1.5 Routine Maintenance Minor Works**

Minor enhancement works in order to improve life of road assets within Routine Maintenance space are considered as Routine Maintenance Minor Works. These Minor Works can be delivered using RMPC and should be funded by the relevant funding element which the defect belongs to. Minor Works should be delivered using the right maintenance activity given in the Maintenance Activity Standards or by using relevant design and construction standards including any departmental Standard Drawings and Technical Specifications.

Transport and Main Roads districts and Contractors should identify Minor Works by taking into consideration:

- Associated cost for the particular Minor Works.
- Degree of improvement to asset's life due to that enhancement.
- Contractors' resources and capability, and
- Contractor's total contract value for the year.

It is recommended that Minor Works value be kept within the manageable limit depending on the contractors' resources and capability. The current Minor Works limit is \$500,000 per contract per one year contract period.

### **1.6 Emergency Maintenance**

Emergency Maintenance works are to be carried out as instructed in RMPC Manual.

### **1.7 Adhering to Native Title requirements during maintenance delivery**

The department must comply with the requirements of the *Native Title Act 1993 (Cth)* and the *Native Title (Queensland) Act 1993*. As a government agency, the department does this by applying the Queensland Government Native Title Work Procedures (NTWP), which are produced and administered by the Department of Resources. When applying the NTWP to road maintenance related activities, the road is considered in its entirety, including any existing ancillary components, i.e. drains, culverts etc, which form part of the road's use and operation.

In general, road maintenance related activities do not impact Native Title (NT) rights and interests. However, if the road maintenance related activities extends beyond the 'existing footprint' of the road, a NT assessment must be undertaken to ensure that there is no affect on NT rights and interests resulting from the road maintenance related activities. In this context, existing footprint refers to the physical layout and components which currently occupy a specific area or site. It encompasses road features that are already in place, established, or constructed, but does not include future modifications or enhancements which spatially go beyond the existing footprint of the road.



In the context of road maintenance, the existing footprint specifically comprises several features including, but not limited to:

- **Constructed Road:** This refers to the roadway that has already been built (either sealed or unsealed).
- **Table Drains:** These are drainage channels or ditches alongside the road.
- **Culvert Inlets / Outlets:** Culverts are structures that allow water to flow under the road. The inlets and outlets are the entry and exit points for water.
- **Scour Protection:** Measures to prevent erosion or damage caused by water flow.
- **Lighting:** Existing lighting fixtures along the road.
- **Signage:** Road signs indicating directions, warnings, or regulations.
- **Guide Markers:** Markers that guide drivers or pedestrians.
- **Graded Shoulders:** The sloped areas adjacent to the road.
- **Sedimentation Ponds:** Ponds designed to capture sediment runoff.
- **Variable Message Signs (VMS) Structures:** VMS structures that display real-time information to road users.
- **Bridge Components:** Any existing components of bridges within the defined area.

Specific road maintenance related activities that may require a NT assessment include, but are not limited to:

- **Stockpile / Set-down Areas Outside of the Road Corridor:** These areas, located beyond the immediate road boundaries, may affect NT rights and interests. This may also encompass existing sites that have not previously undergone a NT assessment.
- **Site Offices / Compounds:** Temporary work areas or facilities established during road maintenance work. This may also encompass existing sites that have not previously undergone an assessment for NT implications.
- **Off-Site Disposal of Waste / Fill:** The removal and disposal of materials, such as soil or debris, from the maintenance site. This would also include existing fill agreements which have not previously undergone a NT assessment.
- **Bridge Works Requiring Barges or Tethering to the Riverbed or Shoreline:** These activities involve the repair or maintenance of bridges where barges are used for access and are anchored to the riverbed or shoreline to provide stability during the works. It is important to note that many waterways are tenured as unallocated state land and, as a result, any road maintenance work in these areas may have implications for NT rights and interests.

If further details or clarification is needed in relation to Native Title and road maintenance related activities, email the Native Title Operations team at [nativetitle@tmr.qld.gov.au](mailto:nativetitle@tmr.qld.gov.au).

## **2 Chapter 2: Defects, Maintenance Activities and road inspections overview**

### **2.1 Defects**

A defect refers to the visible evidence of an undesirable condition in the road infrastructure asset. The defect may affect the safety, serviceability, structural capacity or appearance of the asset. Road defects that are identified only as per the Routine Maintenance IL/RT are considered as Routine Maintenance defects in this Guideline. Further information about defects is available in Chapter 3 and Chapter 4 of this Guideline.

Contractors are required to prioritise defects as directed by the Routine Maintenance IL/RT criteria in terms of their importance for maintenance action. The basis used by the department for prioritisation of defects is explained in Chapter 4. The general defect priority listing has been assembled into 6 groups. These groups are intended to represent the maintenance priorities and the basic order in which Routine Maintenance works should be undertaken.

Recommended Maintenance Activities to rectify the defects are given in the Routine Maintenance Activities list in Chapter 5.

These groups are in order of priority as below:

- **Corporate Priority 1 – Hazard**

Defects where the likelihood of harm occurring is greater than a safety defect as determined by the hazardous defect identification procedure given in Chapter 4, Section 4.1.9.

Action is mandatory in complying with departmental requirements for repairing the identified defect (e.g. water ponding) that is hazardous or likely to create an unsafe situation to road users or likely to damage the road asset.

- **Corporate Priority 2 – Ordered Works / Special**

Work undertaken in accordance with the Principal's order and directions.

Any verified defect identified by inspections, complaint, notification by the Principal. Generally these defects likely to create unsafe situation to road users or likely to damage the road asset. Principal's order and direction is needed to rectify these defects.

- **Corporate Priority 3 – Safety**

Defects that are considered to be of a safety nature.

These activities cover defects which constitute a safety problem to the road user and for which the upper Intervention Level is reached without significant warning, as opposed to usability defects which occur over a period of time and can be planned for repair well in advance of the Intervention Level being reached (e.g. pavement repairs).

- **Corporate Priority 4 – Legislative**

Defects that are required to be repaired by legislation.

These activities also cover any defects that are illegal, completely unacceptable (e.g. offensive graffiti) or required to fulfil obligations as part of the works (e.g. inspections). They also cover legislative requirements for which certain actions are mandatory in complying with the requirements (e.g. spraying of declared plants).

- **Corporate Priority 5 – Preventative**

Defects that if treated will reduce the asset's rate of deterioration.

An example of this is the resealing of cracked areas to prevent potholes and pavement failures forming. Preventative maintenance will hopefully reduce the occurrence of the more costly defect repairs.

- **Corporate Priority 6 – Appearance / Usability**

Defects that are considered a nuisance or unsightly.

These activities generally cover the maintenance of time related useability or appearance defects and those defects which do not fall into either of the above 5 categories.

The defects within each group (excluding hazardous defects and ordered works / special defects) have not been assigned an individual priority. It is intended that the network operator would assign the appropriate field weighting to a defect in order to get the corporate score which will decide the actual priority to fix the defect. There is no field weighting to hazardous defects (Corporate Priority 1) and ordered works / special defects (Corporate Priority 2) in order to manage those defects consistently across the state. Refer to Chapter 4 of this Guideline for further information.

IL/RT criteria in Chapter 4 contains the list of defects that is expected to be repaired by the Contractor under RMPC. A 2-digit alpha code descriptor is used to identify each particular defect and 4-digit code descriptor is used to identify each sub defect.

The defect code descriptors in IL/RT must be used to ensure the reporting accuracy across the state.

## **2.2 Maintenance Activities**

Maintenance Activity describes how a defect is to be repaired. Primarily Maintenance Activities are used to deliver Routine Maintenance works, however, there are a few Maintenance Activities that can be used to deliver other Maintenance Preservation and Operation (MPO) Element Works that are beyond Routine Maintenance. For example, Maintenance Activity Number 147 can be used to deliver pavement repair works that are beyond the Routine Maintenance scope. One Maintenance Activity links to only one Element and therefore no activity that can be used to deliver 2 Element Works. "Maintenance Activities mapped to Element" document provides all the Maintenance Activities with their relevant MPO Element.

A 3-character numeric code is used to identify each maintenance activity.

These corporate code descriptors as well as the activity unit of measure are to be used as specified to ensure there is consistency of reporting across the state.

The unique 3-character numeric code may be expanded with the addition of a further 2 numerals at the end of the unique code, if required, to meet Contract specific requirements.

## **2.3 Valid defect / Activity combinations**

Once the defects on the SCRN have been identified, the Contractor can select a recommended activity to repair the defect.

Any particular defect can be repaired by a number of different activities as set out in IL/RT model.

For example, the defect AG (Potholes) could be repaired by a number of different activities:

- Pothole Patching (Activity Number 105)
- Pothole Patching with Emulsion/Aggregate (Activity Number 106)
- Heavy Patching (Activity Number 107), or
- Emergency Temporary Pavement Repairs (Activity Number 142).

#### **2.4 Maintenance Activity Standards**

Maintenance Activity Standards are set out in Chapter 5 and include a complete listing of Maintenance Activities to be used by the Contractors.

These Activity Standards provide information to the Contractor for the planning, execution and reporting of Maintenance Activities. It is expected these Maintenance Activity Standards will form the basis of the Contractor's Quality Plan for maintenance operations.

The following details for each of the possible activities are contained in the Maintenance Activity Standards:

- unique 3-character reference code
- applicable Transport and Main Roads Technical Specifications
- restoration standards
- units of measurement
- Activity Work Items, if applicable (see Section 2.5)
- testing requirements
- work preparation or work operation details in lieu
- work planning and particular points to consider, and
- work execution, particular points to consider or work operations details in lieu.

These Maintenance Activity Standards may be varied with the approval of the department to suit local circumstances. Variations must be agreed with the department prior to commencement of work.

#### **2.5 Supplementary Work Items**

If required by the Preferred Supplier Contractor some Maintenance Activities have been broken down to possible component tasks. These discreet tasks are called Supplementary Work Items. For example, 'Maintenance Activity Number 110: Surface Correction with Premix / Asphalt (Manual)' is composed of the following Supplementary Work Items with the department's schedule Item Numbers where relevant:

- 955810 Preparation of existing surface
- 955820 Tack Coat
- 955860 Dense Graded Asphalt pavement, 14 mm mix, and
- 955870 Dense Graded Asphalt pavement, 20 mm mix.

Supplementary Work Items allow more detailed cost information to be obtained on important / high cost Maintenance Activities if required by the Contractor.

## **2.6 Restoration standards**

Defects are required to be repaired to a stated degree of completion in the Routine Maintenance Activity Standards. Contractors may be asked to redo the work if the required restoration as per Activity Standards has not been achieved.

## **2.7 Defect liability period**

All Routine Maintenance Works should be carried out in accordance with the Routine Maintenance Activity Standards. Defective Works that are due to nonconforming materials or work procedures are to be fixed at the Contractors' cost. Defect liability periods for some of the Maintenance Activities may be available in Supplementary Condition of the Contract prepared in district level.

## **2.8 Typical RMPC Process**

'Figure 4.1.1-B – System approach to management of maintenance' in the RMPC Manual indicates a process to manage Routine Maintenance works through Routine Maintenance Performance Contract (RMPC). All the activities in this process are to be performed at a reasonably acceptable level in order to achieve efficient and effective Routine Maintenance work. In developing processes, discretionary overheads such as travel and traffic control, and also any work time restrictions may be considered to improve work efficiency.

## **2.9 Road inspection and inspection frequency**

Regular road inspection is an essential part of delivering the Routine Maintenance Work. Therefore, road inspections must be carried out by the Contractors based on agreed inspection frequencies with the department. Carrying out road inspections as agreed is critically important in order to capture and prioritise defects, as per IL/RT criteria, on the Network.

The agreed inspection frequencies must be included into the Contractor's Quality Plan.

## **2.10 Defect Log**

The Defect Log is a list of defects that are captured as per IL/RT requirements during regular Routine Maintenance inspections. All Routine Maintenance defects that have reached their initial Intervention Level must be logged. No defects that are below initial Intervention Level should be logged unless the defect is in the monitoring stage.

## **2.11 Defect Backlog**

Remaining defects in the Defect Log which have not been fixed during the relevant work cycle is called Defect Backlog. Unavailable funding is the primary reason for Defect Backlog. However, permitting other work programs to rectify the defects later in order to have cost effective maintenance delivery could also be a reason for the Defect Backlog. The Defect Backlog must be revisited every inspection cycle in order to get the right priority as the defect may have deteriorated over time since the last inspection.

## **2.12 Routine Maintenance Needs Assessment**

### **2.12.1 Joint Maintenance Requirement Assessment**

A Joint Maintenance Requirement Assessment (JMRA) is a joint departmental / Contractor assessment of the Network to determine the extent of the activities required for the forthcoming Contract period. It is a critical factor in the implementation of the Routine Maintenance management strategy.

From the Contractor's perspective, the JMRA is a key component in the negotiation process necessary with the department to reach an agreement on funding required for contract works on the Network.

As the Administrator of the contract, the JMRA provides an opportunity for districts to design a maintenance program that ensures funds are effectively distributed within the district.

From the department's perspective as the owner of the Network, the JMRA provides the necessary data to ensure realistic statewide Routine Maintenance needs assessments and appropriate fund distribution to districts.

To ensure consistency of assessments across districts, the JMRA for all contracts should be undertaken by an experienced departmental officer such as a Senior Inspector. While alternative arrangements may be suitable, however, the consistency of maintenance needs assessments across the district is critically important.

### **2.12.2 Routine Maintenance needs assessment using JMRA data**

In order to have a consistent JMRA data collection process in statewide level, a new JMRA data collection methodology was developed. Consistently collected JMRA data is crucial to develop JMRA trends over the years and can be used to predict improved JMRA and Routine Maintenance element performance against the element investments.

JMRA data from all Routine Maintenance delivery Contractors are to be collected, reviewed, validated and sent to Routine Maintenance Element Leader by 30 June each financial year to be included into Routine Maintenance needs assessments and distribution models.

#### **2.12.2.1 JMRA data collection methodology**

Over 100 defect types were identified in the road corridor under Routine Maintenance. All these defects should be captured, as described in IL/RT, during the JMRA data collection process. The Defect Log collected, however, represents a snapshot of the Network condition and therefore cannot be solely used as JMRA of the Network for the forthcoming financial year. This Defect Log, along with other appropriate data, can be used to develop the JMRA for the forthcoming financial year, as described below.

Other required data needed to develop the JMRA is:

- Delivered Routine Maintenance works during previous 11 months (fixed defects).
- The current Forward List of Works for the Network progressed to the forthcoming financial year (if any), and
- Any relevant work programs planned for the Network (if any).

The JMRA will identify, for each road on the network:

- the specific Maintenance Activities required
- the defects and appropriate priorities for Works
- approximate quantities required, and
- any necessary Minor Works.

### 2.12.2.2 Routine Maintenance needs assessment by using JMRA data

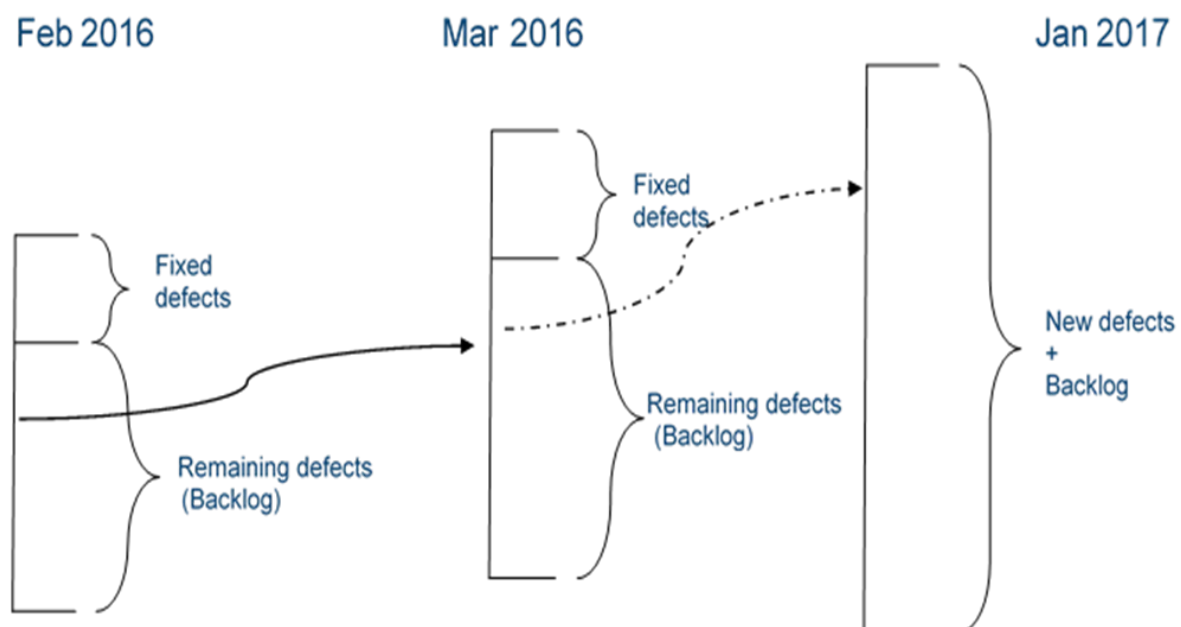
RMPC data such as monthly Defect Log, fixed defects, and Defect Backlog is primarily used to develop JMRA in the new approach. More accurate data with lesser resources is vital to achieve JMRA from all the districts. The following illustration explains how JMRA can be created by using the previous 11 months RMPC data:

- Defect Backlog (for any month) = Defect Log for the month – Fixed defects during the month.
- Defect Log for the month = New defects captured in the month + Previous month's Defect Backlog.
- If maintenance needs for year (0) = Needs (0).
- Needs (0) = 11x fixed defects for the last 11 months of the year (0) + last month Defect Log of the year (0) (Jan 2017 in the illustration).
- Fixed defects mean all Routine Maintenance Works, including planned vegetation control Works, delivered during the month.

Therefore, it is reasonably accurate to calculate JMRA for the year (1) as per below equation:

- JMRA for the year 1 = Needs (1) = needs (year 0) x Inflation – Reductions.
- Reductions = any RM Forward List of Work from previous year + percentage of Needs (1) for the road sections which have planned rehabilitation, reseal or other works in year 1.
- The template supplied in Table 2.1.12.2, can be used to enter all the required data in order to calculate JMRA.

**Figure 2.12.2.2 – Annual JMRA prediction based on fix defects and remaining defects**














### 3 Chapter 3: Routine Maintenance Defects Register





Routine Maintenance Element is responsible for maintaining all the Routine Maintenance defects identified as per IL/RT on the road corridor. There are over 100 types of defects in the IL/RT model. This chapter provides technical background of all Routine Maintenance defects. Clear understanding about the defect and cause for the defects is very important to select the appropriate Maintenance Activity or work program for the defect rectification.


**Table 3 – Routine Maintenance Defects Register**

Defect Code	Defect Name	Image	Description	Possible Causes
AA	Isolated Depressions and Bumps in Bituminous Surface	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Localised depressed sections within a pavement. Depressions not necessarily limited to wheel paths and may extend to entire lane width. Depressions are clearly visible after a rain when they fill with water.</p> <p>Bumps is a localised upward movement in a pavement.</p>	<p>Settlement of widening trenches. Poorly compacted isolated sections of subgrade or base. Volume changes in subgrade materials due to various reasons such as drying out due to tree roots or change in moisture content of expansive soil.</p> <p>Settlement or failure of utility assets underneath the pavement.</p> <p>Poorly treated abandoned mining holes / ditches underneath / next to the pavement. Settlement due to the instability of embankment.</p>
AB	Ruts in Bituminous Surface	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Ruts in pavements are channelised depressions in the wheel paths, generally appears in long sections due to consolidation or lateral movement of pavement or subgrade due to traffic action.</p>	<p>Pavement age, frequent presence of overloaded vehicles and/or heavy vehicles on the pavement.</p> <p>Inadequate pavement layer thickness. Inadequate compaction in surfacing or base layers. Inadequate strength in surfacing or base layers.</p>
AC	Shoving of Pavement or Asphalt	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Shoving is the formation of swells generally found in the edge of the wheel path due to traffic actions.</p> <p>Shoving also occurs at locations having severe horizontal stresses, such as intersections.</p>	<p>Inadequate strength in surfacing or base layers due to a number of reasons such as poor compaction, inadequate layer thickness.</p> <p>Poor bond between pavement layers.</p>





Defect Code	Defect Name	Image	Description	Possible Causes
AD	Very Rough Surface (Isolated Sections) in Bituminous Surface	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Localised area within a pavement that has affected the wearing course of the bituminous surface	Loss, damage or corrugated surface course due to surface or underlying base course failure.
AE	Potholes in Bituminous Surface	 <p>Source: Transport Main Roads District Defect Backlog</p>	<p>Irregular bowl-shaped cavity extending into pavement layers.</p> <p>Small, bowl-shaped cavity in the pavement surface that penetrates all the way through the surfacing layer down to the base course.</p>	Untreated crocodile cracking permitting the loss of surface course. Moisture ingress to pavement layers through a cracked surface. Disintegration of base due to heavy loading. Loss / damage surfacing layer due to binder adhesion to tyres.
AE	Delamination in Bituminous Surface	 <p>Source: Transport Main Roads District Defect Backlog</p>	<p>Loss of a large, discrete area of the surfacing layer.</p> <p>Surfacing layer separation from the below layer is clearly visible In most situations.</p>	<p>Poor bond between upper surfacing layer and layer below due to inadequate cleaning or inadequate tack coat before placement of upper surfacing layers.</p> <p>Weakening of the bond between surfacing layer and the below layer due to various reasons such as water ingress, traffic action.</p> <p>Loss / damage surfacing layer due to binder adhesion to tyres.</p>
BA	Crocodile Cracking in Bituminous Surface	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Small irregular shape polygons formed generally in wheelpaths.</p> <p>Plate / cell sizes are normally less than 150 mm.</p> <p>Crocodile cracking is load-related and normally starts in the wheel path as longitudinal cracking and ends up as crocodile cracking after severe distress.</p>	<p>Insufficient pavement layer thickness.</p> <p>Brittle base or wearing course due to age or cemented base.</p> <p>The failure can be due to weakness in the surface, base or sub grade or poor drainage.</p>







Defect Code	Defect Name	Image	Description	Possible Causes
BB	Bituminous Surface Cracks General			
BB	Block Cracks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Block cracks generally form large, interconnected rectangles on the pavement. Block cracks are not due to traffic loading.</p> <p>Block size and shape generally reflect the joints of the base layer as the cause for the cracks.</p>	<p>These cracks are primarily due to shrinkage and fatigue of underlying cemented materials.</p> <p>Shrinkage of the asphalt pavement due to temperature cycles over the time.</p> <p>Joints in underlying base layer.</p>
BB	Transverse Cracks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Unconnected cracks run laterally across the pavement.</p> <p>Transverse cracks are non-related cracks.</p>	<p>These cracks are primarily due to shrinkage of the surfacing layer or reflection of shrinkage cracks or joints in underlying base layer.</p>
BB	Diagonal Cracks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Unconnected cracks run diagonally across a pavement</p>	<p>Shrinkage of the surfacing layer or reflection of shrinkage cracks or joints in underlying base layer.</p> <p>Differential settlements between embankments, cuts or structures or any other. Tree roots. Service installation.</p>
BB	Longitudinal Cracks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Cracks running longitudinally along the pavement.</p> <p>Longitudinal cracks are non-load related and can happen singly or as series of almost parallel cracks. Some limited branching may occur.</p>	<p>These cracks are primarily due to contraction and shrinkage of the surfacing layer or reflection from the underlying base layer joints, poorly constructed surfacing layer joints or subgrade settlement.</p>





Defect Code	Defect Name	Image	Description	Possible Causes
BB	Meandering Cracks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Non-load related unconnected irregular cracks on the pavement usually singly and varying in direction.	Reflection of a shrinkage crack in underlying pavement base material (cemented or fine granular materials). Weakening of the pavement edge through moisture entry. Differential settlements between embankments, cuts or structures. Tree roots.
CA	Edge Break in Bituminous Surface	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Edge of the bituminous surface fretted, broken or irregular.	Inadequate pavement width. Alignment which encourages drivers to travel on pavement edge. Inadequate edge support. Edge drop-off. Weak seal coat, loss of adhesion to base.
CB	Edge Drop-off in Bituminous Surface	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Vertical distance from the surface of the seal at the edge to the surface of the shoulder.	Inadequate pavement width. Shoulder material with inadequate resistance to erosion and abrasion. Resurfacing of pavement without resurfacing of shoulder.
CB	Edge Rollover in Bituminous Surface	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Vertical distance from the new overlay / resealed pavement surface to the existing sealed pavement layer.	Inadequate new overlay / resealed pavement surface width. New overlay / resealed pavement not replaced over full width of existing pavement. New overlay edge has not been appropriately constructed to make safe transition to previous surfacing layer or shoulder.




Defect Code	Defect Name	Image	Description	Possible Causes
DA	Flushing, Bleeding Seal	 <p>93A_1(Diamantina Developmental Road:23 41 03/03-2016)</p> <p>Source: Transport and Main Roads District Defect Backlog</p>	Presence of excess bitumen in the pavement surface layer which creates patches with low skid resistance due to inadequate tyre-to-stone contact.	Excessive application rate of binder, with respect to stone size. Excessive prime coat being incorporated into the seal. Excess binder in underlying patch or flushed area. Penetration of aggregate into low strength base. Primer seal covered before volatiles in primer binder have evaporated.
DB	Ravelling Seal	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Initially fine aggregate breaks loose and leave small patches in the pavement surface. That leads to progressive disintegration of the pavement surface by loss of both binder and aggregates.	Insufficient adhesion between the asphalt and the aggregate. Deterioration of binder and/or stone. Inadequate compaction or construction during wet or cold weather. Hydrophilic aggregates used during the constructions.
DB	Stripping Seal	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Removal of the coarse aggregate of a sprayed seal leaving the binder exposed to tyre contact - can happen at the loss of individual stones, or as the complete loss of stone in a localised area.	Low binder contents. Poor binder to stone adhesion (dirty or hydrophilic aggregates, without effective pre-coating with adhesion agent or wet stone etc). Aging or absorption of binder. Stone deterioration. Incorrect blending of binder. Inadequate rolling before opening the seal to traffic.
DC	Other Bituminous Surface Texture Defects (i.e. Polishing Seal)	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Smoothing and rounding of the upper surface of the roadstone, usually occurs in the wheel tracks. Identified partly by relative appearance and feel of trafficked and untrafficked areas. Polished areas will feel relatively smooth and will sometimes be noticeably shiny.	Inadequate resistance to polishing of surface aggregates, particularly in areas of heavy traffic movements, or where high stresses are developed between surface and tyres (e.g. corners, grades). Use of naturally smooth uncrushed aggregate (e.g. water-worn gravel).





Defect Code	Defect Name	Image	Description	Possible Causes
EA	Loose Stones or Debris on Sealed Roadway	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Debris / foreign material / loose stones on roadway.	Wind, water, vehicle or road user made transportation of loose stones or debris onto or away from the roadway surface.
EB	Grass on Sealed Roadway	 <p>Source: Transport Main Roads District Defect Backlog</p>	Vegetation growth around kerb and channel, along fence lines and on road pavement that create unsafe road condition.	Lack of vegetation control measures in place.
EC	Deceased Animals on Roadway	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Carcass on the roadway.	Livestock, pets and native animals struck and/or killed by vehicles travelling on roadway.
ED	Rough Manhole Covers and Grates (Rough Service Access Facility)	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Manhole cover or grates which are not vertically aligned with the road surface.	Damage to manhole covers and grates caused by environmental issues, lack of maintenance or a range of light, medium and heavy class vehicles travelling on roadway. Pavement repairs or surface correction around the manhole covers or grates.







Defect Code	Defect Name	Image	Description	Possible Causes
EE	Debris on Sealed Shoulders	 <p>Source: Transport Main Roads District Defect Backlog</p>	Debris / foreign material / litter on sealed shoulders.	Wind, water, vehicle or road user made transportation of debris onto or away from the shoulder surface.
EF	Depressions Service Reinstatement (Rough Service Trench Reinstatement)	 <p>Source: Transport Main Roads District Defect Backlog</p>	An area of pavement surface where the original has been replaced. Reconstruction patches are usually straight sided.	Excavation for new and/or existing services.
FA	Insufficient (Adverse) Crossfall in Unsealed Shoulder	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Insufficient camber or slope of the unsealed shoulder from the edge line.	Initial insufficient crossfall during the construction. Lack of shoulder maintenance.
FB	Excessive Crossfall in Unsealed Shoulder	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Excessive camber or slope of the unsealed shoulder from the edge line.	Erodible shoulder surfacing materials. Excessive pavement thickness. Inadequate compaction in sub-base or subgrade. Inadequate strength (stability) in subbase or subgrade.




Defect Code	Defect Name	Image	Description	Possible Causes
FC	Lateral Scour Channels in Unsealed Shoulders	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Steep, irregularly sided, relatively linear feature, commonly in the direction of maximum slope or along a wheelpath.	Erodible surfacing materials. Concentration of water flows owing to: a) blocked or inadequate road drainage system, and/or b) rutting and corrugations.
FD	Hazardous Dry Loose Material in Unsealed Shoulders	 <p>Source: Transport Main Roads District Defect Backlog</p>	Unbound fine or coarse gravel materials on the pavement surface. Can occur as a variable thickness layer (sheet) over the whole surface, or in narrow continuous mounds between wheelpaths or lanes, or between the outer wheel path and table drains.	Ravelling of weakly bound pavement materials owing to environment composition (e.g. grading, plasticity) or lack of compaction. Wind or water transportation of materials onto or away from the roadway surface.
FE	Ruts in Unsealed Shoulders	 <p>Source: Transport Main Roads District Defect Backlog</p>	Longitudinal and relatively smoothly shaped deformation on the shoulder. Wet weather ruts tend to be steep sided and reflect the impression of the tyre into the road surfaces.	Inadequate wet strength of subgrade or pavement layer. Wear by attrition due to traffic or erosion of surface material. Excessive loose material. Traffic compaction of pavement or subgrade.
FF	Debris on Unsealed Shoulder	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Foreign material or debris on unsealed shoulder.	Wind, water or manmade transportation of debris onto or away from the shoulder surface.









Defect Code	Defect Name	Image	Description	Possible Causes
FG	Reduced Shoulder Width in Unsealed Shoulders	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Inadequate shoulder width to accommodate road user safety or pavement integrity.	Inadequate initial compaction. Variable quality of paving materials. Reduction of shoulder design width.
FH	Potholes in Unsealed Shoulder	 <p>Source: Transport and Main Roads District Defect Backlog</p>	A bowl-shaped depression in the unsealed shoulder. Potholes can have steep or gently sloping sides and be of irregular shape.	Ponding of water. Blocked or inadequate road drainage system. Excessive weakening of pavement by moisture. Inadequate initial compaction. Variable quality of paving materials.
FI	Shoulder Defects, General	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Any shoulder defects likely to create unsafe road condition.	Accumulation of foreign materials or debris on the shoulder. Lack of shoulder maintenance.
FI	Coarse Surface		Bulge of very coarse aggregate or rock (particle size usually greater than 75 mm) from the shoulder surface, some loose on surface.	Attrition or erosion of coarse pavement material. Accumulation of foreign materials or debris on the shoulder.

Defect Code	Defect Name	Image	Description	Possible Causes
GA	Wheel Ruts in Unsealed Roadways	<p>Source: Transport and Main Roads District Defect Backlog</p>  <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Longitudinal and relatively smoothly shaped deformation at the wheelpaths. Wet weather ruts tend to be steep sided and reflect the impression of the tyre into the road surfaces.</p>	<p>Inadequate wet strength of subgrade or pavement layer. Wear by attrition due to traffic or erosion of surface material. Excessive loose material. Traffic compaction of pavement or subgrade.</p>
GB	Shoving in Unsealed Roadways	<p>May 25, 2017 7:29 AM -11.475488, 147.459284 Durrigal Hwy Road   82A   144.85</p>  <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Plastic bulging of pavement surface commonly occurring in association with depression or rutting.</p>	<p>Plastic deformation of pavement or subgrade.</p>
GD	Insufficient Crossfall in Unsealed Roadways	 <p>Source: Transport Main Roads District Defect Backlog</p>	<p>Insufficient camber or slope from the crown of the road to sides of the road.</p>	<p>Erodible surfacing materials. Inadequate initial compaction. Variable quality of paving materials. Poor drainage system allowing water to flow on the road.</p>
GE	Excessive Crossfall in Unsealed Roadways	<p>February 20, 2017 11:29 AM -21.691378, 139.552861 Cloncurry - Dajarra Road   7708   165.46</p> 	<p>Excessive camber or slope from the crown of the road to sides of the road.</p>	<p>Excessive pavement thickness due to design and/or construction failure. Inadequate compaction in sub-base or subgrade. Inadequate strength (stability) in sub-base or subgrade.</p>











Defect Code	Defect Name	Image	Description	Possible Causes
GC	Potholes in Unsealed Roadways	<p>Source: Transport and Main Roads District Defect Backlog</p>  <p>November 30, 2016 9:46 AM -16.525829, 143.923382 Burke Dev Road   89B   455.64</p> <p>Source: Transport and Main Roads District Defect Backlog</p>	A bowl or irregular shaped cavity extending into the pavement layers.	Ponding of water. Excessive weakening of pavement by moisture, traffic action or environmental actions. Inadequate initial compaction.
GG	Insufficient Formation Height above Natural Surface	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Insufficient formation height above natural surface. Loss of formation shape.	Erodible surfacing materials. Insufficient pavement thickness. Inadequate compaction in sub-base or subgrade. Inadequate strength (stability) in sub-base or subgrade.
GF	Loss of Pavement Running Course	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Loss of pavement running course due to traffic or environmental actions.	Erodible surfacing materials. Insufficient pavement thickness. Inadequate compaction in sub-base or subgrade. Inadequate strength (stability) in sub-base or subgrade.

Defect Code	Defect Name	Image	Description	Possible Causes
GH	Unsealed Roadway Defects, General			
GH	Corrugations	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Transverse undulations, closely and regularly spaced on the pavement.	Inadequate quality of base material for prevailing climatic and traffic conditions. Inadequate compaction in pavement layers. Most common in dry conditions.
GH	Scour Channels	 <p>Source: Transport Main Roads District Defect Backlog</p>	Steep, irregularly sided, relatively linear feature, commonly in the direction of maximum slope or along a wheelpath.	Erodible surfacing materials. Concentration of water flows owing to: a) blocked or inadequate road drainage system b) rutting and corrugations.
GH	Loose Material	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Unbound fine or coarse gravel materials on the pavement surface. Can occur as a variable thickness layer (sheet) over the whole surface, or in narrow continuous mounds between wheelpaths or lanes, or between the outer wheel path and table drains.	Loosening of weakly bound pavement materials due to environmental or traffic actions. Wind or water transportation of materials onto or away from the roadway surface.


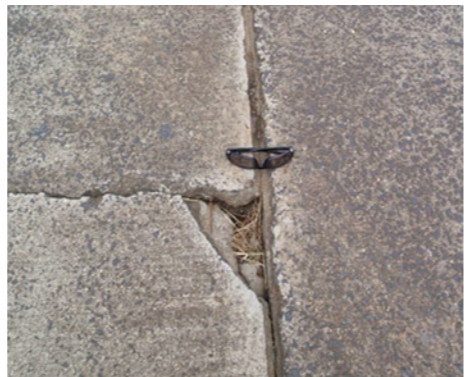


Defect Code	Defect Name	Image	Description	Possible Causes
GH	Coarse Surface	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Protrusion of very coarse aggregate or rock (particle size usually greater than 75 mm) from the pavement surface, some loose on surface.</p>	<p>Attrition or erosion of fines from coarse pavement material. Exposure of rock subgrade.</p>
GI	Surface Drain Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Blocked or defect of surface drain causing or likely to cause flooding to the roadway or private property.</p>	<p>Blocked or defect of surface drain which restricts flow or causes grade change.</p>
HA	Drainage Obstructed	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Any drainage obstruction creating water ponding and not free draining on pavement edge or on shoulder (free draining means water disperses without action of traffic).</p>	<p>Damaged or missing sections of drain. Blocked by debris, stones, roots and branches caused by environmental or human intervention.</p>
HB	Silt or Debris on Floodway Sections	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Any silt or debris encroaching into floodway sections of roadway.</p>	<p>Wind, water or manmade transportation of silt or debris onto or away from the floodway surface.</p>







Defect Code	Defect Name	Image	Description	Possible Causes
HC	Culvert, Pipe, Pit and Floodway Defects, Other			
HC	Culvert, Pipe, Pit and Floodway Defects, Other	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Damaged or missing drainage pit lids, surrounds, grates, in pedestrian areas or traffic lanes.	Pit lids, surrounds, grates moved or damaged due to heavy flows or manmade actions. Pipe, culvert, pit, floodway and associated drainage Works not constructed / installed in accordance with approved design. Proper inspections during construction and maintenance period not carried out.
HC	Cracking in Culvert Components or Visible Movement	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Cracking > 5 mm in culvert components or visible movement. Cracking in end structures.	Traffic, environmental or manmade actions on the culvert or culvert components. Inspections during construction and maintenance period not carried out.
HC	Misalignment / Separation of Culvert Components	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Misalignment and/or separation of culvert components.	Settling or movement of the culvert components due to traffic loading, environmental actions or aging. Culvert and associated drainage Works not constructed / installed in accordance with approved design. Inspections during construction and maintenance period not carried out.
HC	Corrosion / Loss of Section of Steel Components (including Reinforcement in Concrete Structures)	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Corrosion / loss of section of steel components. Peeling off the reinforcement cover in concrete structures.	Peeling off concrete cover due to extended cracking in the culvert components. Pipe, culvert, pit, floodway and associated drainage Works not constructed / installed in accordance with approved design. Proper inspections during construction and maintenance period not carried out.





Defect Code	Defect Name	Image	Description	Possible Causes
HC	Culvert or End Structure Silted Up	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Visible movement of culvert, component or end structure	Culvert blocked by debris, stones, roots and branches caused by environmental or human intervention.
HC	Scouring around Culvert Components	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Scouring around culvert components.	Culvert blocked by debris, stones, roots and branches caused by environmental or human intervention. Outlet not free flowing.
HD	Cracks in Concrete Roadway			
HD	Block Cracks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Interconnected cracks forming a series of blocks, approximately rectangular in shape, commonly distributed over the full pavement. Cell sizes are usually greater than 1 m.	Generally a combination of traffic loading and loss of support. Insufficient slab thickness. Loss of sub-base or subgrade support. Subgrade settlement.
HD	Longitudinal Cracks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Unconnected crack running longitudinally along the pavement. Can occur singly or as series of almost parallel cracks.	Generally a combination of traffic loading and loss of support. Differential settlement. Lateral shrinkage associated with excessive slab width. Longitudinal joint too close to traffic lane. Longitudinal joint too shallow. Insufficient slab thickness.







Defect Code	Defect Name	Image	Description	Possible Causes
HD	Transverse Cracks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Unconnected crack running transversely across the pavement / slab.	Normal shrinkage. Shrinkage of slab during curing, associated with excess slab lengths or joints sawn too late. Insufficient slab thickness. Rocking of slab.
HD	Corner Cracks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	A crack that intersects the slab joints near the corner. A crack extending diagonally from a longitudinal edge to a transverse joint.	Severe corner stresses caused by load repetitions combined with a loss support, poor load transfer across the joint. Insufficient slab thickness. Loss of sub-base or subgrade support.
HE	Spalling of Joints - Concrete Pavement	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Cracking, breaking or chipping of joint / crack edge.	Reduces slab contact area and incompressible materials fill the joint or crack. Severe corner stresses caused by load repetitions combined with a loss support, poor load transfer across the joint. Corrosion of reinforcing or dowel bars. Misalignment of dowel bars. Sub-base movement. Poor quality concrete aggregate.
HF	Joint Sealant Defects in Concrete Pavement	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Loss and/or cracking of the seal resulting in foreign material in the joints. Extrusion of sealant leaving mound at the joint.	Ageing and weathering of sealant. Poor preparation or quality of sealant (e.g. overheating of poured sealant). Lack of adhesion of sealant to joint wall. Poor cyclic tension and compression properties. Too much sealant in the joint. Poor shape of sealing joint. Insufficient sealant in the joint. Pumping. Slab rocking.








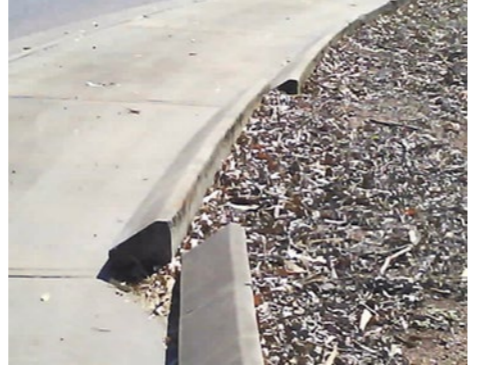

Defect Code	Defect Name	Image	Description	Possible Causes
HG	Potholes in Concrete Pavement	 <p>Source: Transport and Main Roads District Defect Backlog</p>	A bowl-shaped depression in the pavement surface. A depression or broken part of the slab.	Can indicate the localised construction defect such as placement of reinforcement too close to the surface. Pavement cracking and disintegration of concrete. Localised cracks inside the openings of reinforcement. Local overworked area.
HH	Sunken Concrete Pavement Slab (Stepping)	 <p>Source: Transport and Main Roads District Defect Backlog</p>	A difference in elevation across a joint or crack. Usually, the approach slab is higher than the leave slab due to pumping.	Stepping is commonly due to slab settlement, slab pumping, curling and warping. Poor compaction of sub-base layers. Poor subgrade support. Differential settlement of subgrade. Loss of fines from sub-base or subgrade through pumping.
HG	Patches in Concrete Pavement	 <p>Source: Transport and Main Roads District Defect Backlog</p>	An area of pavement that has been replaced with new material to repair the existing pavement.	Previous localised pavement deterioration that has been removed and patched. Correction of surface or structural deficiencies. Reinstatement after excavation for services.
IA	Subsoil Drain Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Any non-functional, blocked or inoperable decayed element of the subsoil drainage system causing reduced flow capacity or drainage integrity.	Damaged or missing sections of subsoil drain. Blocked by soil, stones, roots and any other caused by environmental or human intervention.

Defect Code	Defect Name	Image	Description	Possible Causes
JA	Grass Not in Sight Line	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Excessive roadside vegetation not in the sightline however may impact on drainage system and/or may create fire hazard in rural and urban areas.	Roadside vegetation not maintained and encroaches into the road reserve.
JB	Large Trees and Shrubs Close to Roadway	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Unattended trees grown in road reserve close to the trafficked lanes.	Ongoing maintenance not carried out in accordance with departmental requirements and standards.
JC	Declared Plants	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Identification of plants declared under the legislation have been ranked on the basis of declared status, propensity for dispersion through the Road Network and feasibility of treatment.	Declared plants allowed to propagate throughout the Road Network.
JD	Trees or Limbs Likely to Fall on Roadway	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Trees, branches, and vegetation that intrudes in the traffic envelope. Vegetation that impacts the normal operation of vehicles (including cycles) or may impact vehicles.	Ongoing maintenance not carried out in accordance with departmental requirements and standards.


Defect Code	Defect Name	Image	Description	Possible Causes
JE	Grass, Trees and Shrubs in Sight Line, Drain or Obstructing Roadside Furniture	 <p>Source: Transport Main Roads District Defect Backlog</p>	Any vegetation obscuring sight distance, minimum stopping distance or obstructing road furniture or drainage system.	Ongoing maintenance not carried out in accordance with departmental requirements and standards. Roadside vegetation not maintained and encroaches onto the road reserve.
JF	Landscaping Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Any roadside landscaping that has impact on road functionality.	Neglected landscaping or ongoing maintenance not carried out in accordance with departmental requirements and standards.
JG	Grass Growth on Medians	 <p>Source: Transport Main Roads District Defect Backlog</p>	Visible grass growing in medians that has impact on road usability or aesthetic performance.	Ongoing vegetation maintenance not carried out in accordance with departmental requirements and standards. Sweeping and maintenance on roadside medians not carried out appropriately.
KC	Litter, Below Standard Amenity Furniture in Rest Area	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Unusable amenity, furniture or overflowing litter bins in rest areas.	Person or persons leave or abandon litter and/or rubbish within the rest area. Timely litter bins emptying, maintaining rest area amenity and furniture process not in place.







Defect Code	Defect Name	Image	Description	Possible Causes
KA	Dead Trees or Limbs in Rest Area	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Dead trees, trees, overhanging branches or broken limbs most likely to fall on rest areas.	Ongoing maintenance not carried out in accordance with departmental requirements and standards.
KB	Routine Amenity Servicing	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Damaged, vandalised or cleanliness making facility unusable.	Person or persons leave or abandon litter and/or rubbish, damage or vandalise the rest area facility.
KD	Rest Area Defects Other	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Any rest area defects, that are not covered in above, making facility unsafe or unusable.	Ongoing maintenance not carried out in accordance with departmental requirements and standards.





Defect Code	Defect Name	Image	Description	Possible Causes
LA	Unauthorised Signs	 <p>Source: Transport and Main Roads Defect Backlog</p>	Unauthorised signs erected within the road corridor	Signs installed by unauthorised person or persons without proper approval
LB	Unstable Batter / Embankment, Missing Material	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Cut or embankment with cracks, erosion or instability that may create dangerous or unsafe road environment.	Material of poor quality, insufficient compaction of material, material scoured away due to excessive water run-off. Unstable batter or cut due wet weather conditions.
LC	Damaged Concrete or Paving Blocks	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Damaged, displaced concrete or paving blocks in pedestrian areas, road environment.	Damage to concrete or pavement block caused by environmental, human or vehicular intervention.
LD	Loose Earth, Rock in Sight Line	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Loose earth, rock or any materials in sight Line within the road corridor.	Earth, rocks or material on the road reserve due to environmental or human intervention. Materials scoured away due to excessive water run-off.







Defect Code	Defect Name	Image	Description	Possible Causes
LE	Litter on Road Reserve	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Litter dumped on the road reserve.	Person or persons leave or abandon litter and/or rubbish on the road reserve.
LF	Graffiti	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Any graffiti considered offensive and highly visible to public. Graffiti affects road sign legibility.	Person or persons graffiti signs, buildings, fences, structures, vehicles with highly visible or offensive material.
LG	Scoured Areas on the Road Reserve	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Steep, irregularly sided, relatively linear feature, commonly in the direction of maximum slope or along a wheelpath on unsealed roads.	Water flows over the road reserve due to blocked culverts caused by environmental or human intervention. Lack of proper drainage facility.
LH	Abandoned Vehicles	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Abandoned vehicle or equipment on road reserve.	Person or persons leave or abandon vehicle on road reserve.




Defect Code	Defect Name	Image	Description	Possible Causes
LI	Illegal Accesses	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>An access that does not comply with the <i>Transport Infrastructure Act 1994</i> (TIA) to lawfully construct, maintain and use a vehicle property access onto a state-controlled road.</p>	<p>Illegal access to state-controlled road installed by unauthorised person or persons without proper approval.</p>
LJ	Illegal Turning Areas	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>A turning area that doesn't comply with the <i>Transport Infrastructure Act 1994</i> (TIA) to lawfully construct, maintain and use a vehicle turning area onto a state-controlled road.</p>	<p>Illegal turning area onto state-controlled road installed by unauthorised person or persons without proper approval.</p>
LK	Landscape Vegetation Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Landscape vegetation in any visually sensitive locations is likely to compromise road user safety.</p>	<p>Fallen trees or tree branches to road reserve due to severe weather conditions. Ongoing maintenance not carried out in accordance with departmental requirements and standards.</p>
LL	Damaged Transport and Main Roads Fencing	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Missing or damaged departmental fencing in road reserve.</p>	<p>Fencing is missing or damaged due to environmental, human or vehicular intervention. No proper periodic maintenance program in place. The damage to the fence due to environmental effects.</p>






Defect Code	Defect Name	Image	Description	Possible Causes
LM	Damaged Transport and Main Roads Noise Barrier Fencing	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Missing or damaged departmental noise barrier fencing on road reserve.	Noise barrier fencing is missing or damaged due to environmental, human or vehicular intervention. No proper periodic maintenance program in place.
LN	Damaged or Unserviceable Bus Shelters	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Bus shelter is unserviceable or damaged.	Bus shelter is unserviceable or damaged due to environmental, human or vehicular intervention. No proper periodic maintenance program in place.
LO	Sediment Pond Defects General	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Silted or unserviceable sedimentation pond facilities.	Sediment pond not acting in accordance with design. No proper periodic maintenance program in place.
LP	Damaged Roadside Weighing Area	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Damaged or unserviceable roadside weighing area.	Roadside weighing area is unserviceable or damaged due to environmental, human or vehicular intervention. No proper periodic maintenance program in place.






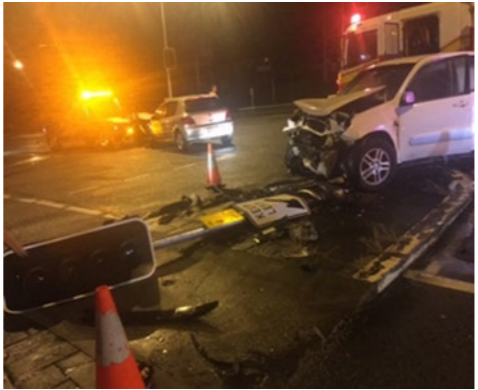
Defect Code	Defect Name	Image	Description	Possible Causes
MA	Missing, Damaged or Dirty Regulatory, Warning or Hazard Sign	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Missing, damaged or dirty signs.	Signage has become dirty due to environmental issues, damaged by environmental, human or vehicular intervention and/or missing due to human or vehicular intervention.
MB	Missing or Defective Guide Sign	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Any guide sign dirty or damaged beyond repair or, if after cleaning, sign is still not legible.	Signage is missing, dirty or damaged due to environmental, human or vehicular intervention.
MC	Sign Misalignment	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Sign is on a noticeable lean, inclined to line of sight or reflecting glare from vehicles lights at night.	Signage has become misaligned due to environmental, human or vehicular intervention.
NA	Guide Post or Delineator Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Any missing guide posts in a hazardous location. The post is on a noticeable lean or there is an inability at night to see delineators ahead due to guide post location or any missing delineators on guardrail installation. (Above relates to observation after cleaning the post and delineator, on low beam.)	Guide post or delineators is missing or damaged due to environmental, human or vehicular intervention.




Defect Code	Defect Name	Image	Description	Possible Causes
NC	Reference Marker Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Reference marker not visible or missing.	Reference marker is missing or damaged due to environmental, human or vehicular intervention.
NB	Guardrail, Fencing and Concrete Barrier Structural Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Damaged and/or missing guardrail, guardrail components, fencing or concrete barriers.	Guardrail, fencing or concrete barrier is missing or damaged due to environmental, human or vehicular intervention.
ND	Kerb or Dyke Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Continuous kerbing damaged or missing.	Kerb or dyke is missing or damaged due to environmental, human or vehicular intervention.





Defect Code	Defect Name	Image	Description	Possible Causes
NE	Guardrail, Fencing and Concrete Barrier Appearance Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Damaged and/or missing guardrail, guardrail components, fencing or concrete barriers.	Guardrail, fencing or concrete barrier is missing or damaged due to environmental, human or vehicular intervention.
OA	Missing or Faded Painted Road Lines and Markings	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Road marking are faded, missing, incomplete or unsatisfactory.	Road lines and markings are missing or damaged due to environmental, human or vehicular intervention.
OB	Raised Pavement Marker Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Loss of, or loss of reflectivity (%) of markers or any consecutive markers are missing.	Raised pavement marker is missing or damaged due to environmental, human or vehicular intervention.






Defect Code	Defect Name	Image	Description	Possible Causes
PA	Traffic Signal Controller Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Flashing yellow:</p> <ul style="list-style-type: none"> <li>• site blacked out</li> <li>• confusing signal displays</li> <li>• controller knocked down</li> <li>• stuck in phase / not cycling</li> <li>• safety critical times too short</li> <li>• skipping phase, not serving vehicle or pedestrian demands</li> <li>• train (heavy rail) interface not operating correctly</li> <li>• tram (light rail) interface not operating correctly</li> <li>• 2 lamps out or more per signal group failure</li> <li>• twisted and non-conflicting lantern arrangement</li> <li>• lamps out (other than pedestrian "Don't Walk" lamps)</li> <li>• visors or louvres missing or damaged</li> <li>• lenses damaged</li> <li>• missing / defaced labelling</li> <li>• security access lock damaged</li> <li>• facility switch damaged / jammed / inoperable</li> <li>• conflicting signal groups activated (conflict monitor fault), and/or</li> <li>• loop detector module not operational.</li> </ul>	<p>Broken or operationally degraded traffic signal controller due to one or a number of internal components being compromised. Access compromised as a result of vandals.</p>
PB	Traffic Signal Lantern Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Flashing yellow:</p> <ul style="list-style-type: none"> <li>• confusing signal displays</li> <li>• misaligned lantern causing confusing signal displays</li> <li>• damaged or open door on lantern</li> <li>• damaged lantern or lantern parts at risk of falling</li> <li>• twisted and non-confusing lantern arrangement</li> <li>• missing or damaged hardware (i.e. missing pole and/or associated hardware)</li> <li>• lamp outages</li> <li>• visors, cowls, louvers or target boards missing or damaged</li> <li>• poor lantern aiming, and/or</li> <li>• loss of displays.</li> </ul>	<p>Broken or operationally degraded signal lanterns.</p>
PC	Traffic Signal Electrical Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Flashing yellow:</p> <ul style="list-style-type: none"> <li>• damaged or missing finial cap / traffic signal mast arm junction box / JU pole terminal panel cover / controller cabinet door</li> <li>• hanging or damaged cables</li> <li>• exposed terminals wires / cables</li> <li>• audio tactile unit fault</li> <li>• excessive heat load or high impedance joints (poor electrical conductivity) as detected through thermal imaging, and/or</li> <li>• any electrical touch potential present on poles.</li> </ul>	<p>Electrical faults or damage of the traffic signal.</p>

Defect Code	Defect Name	Image	Description	Possible Causes
PD	Traffic Signal Hardware Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<ul style="list-style-type: none"> <li>• confusing signal displays</li> <li>• damaged and dangerous post / pole (including knockdowns)</li> <li>• controller knocked down</li> <li>• damaged push button</li> <li>• push button not operating and not placing a demand</li> <li>• stuck in phase / not cycling</li> <li>• skipping phase, not servicing vehicle or pedestrian demands</li> <li>• trivision sign fault causing confusion</li> <li>• audio tactile unit fault</li> <li>• misaligned and non-confusing lantern arrangement</li> <li>• missing or damaged hardware (i.e. missing pole and/or associated hardware)</li> <li>• lamp outages</li> <li>• visors, louvres or target boards missing or damaged</li> <li>• poor lantern aiming</li> <li>• loss of displays</li> <li>• failed inductive loops or loop feeder cables</li> <li>• finish, controller obviously out of plumb, pole obviously out of plumb, signal hardware out of plumb, tidiness, cleanliness etc, and/or</li> <li>• pedestrian walk phase lanterns failed / misaligned.</li> </ul>	Broken or missing traffic signal hardware.





Defect Code	Defect Name	Image	Description	Possible Causes
PE	Traffic Signal Defects Other	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<ul style="list-style-type: none"> <li>• vehicle detector is manually or, through fault, locked-on operating and placing a traffic phase demand</li> <li>• heavy rail detector locked-on or not operating</li> <li>• queue detection equipment on ramp metering (on ramps and off ramps)</li> <li>• UPS failure</li> <li>• misaligned and non-confusing lantern arrangement</li> <li>• missing or damaged hardware (i.e. missing pole and/or associated hardware)</li> <li>• lamp outages</li> <li>• loss of displays</li> <li>• failed inductive loops</li> <li>• finish, controller obviously out of plumb, pole obviously out of plumb, signal hardware out of plumb, tidiness, cleanliness etc</li> <li>• detector failures causing phases to be called and/or extended unnecessarily</li> <li>• communications failure</li> <li>• timing fault (not safety critical times)</li> <li>• button failures causing phases to be called and/or extended unnecessarily Any defect such as given</li> <li>• traffic signal pedestal damaged, and/or</li> <li>• loss of grouting on poles.</li> </ul>	<p>Items listed under Description have potential to cause a dangerous or hazardous situation.</p>
PF	Electrical Cable Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Unsafe and/or operationally degraded electrical cable pit or missing / damaged electrical cable pit lid located in areas of road reserve not accessible by pedestrians.</p>	<p>Cable pits damaged by environmental, human and vehicular impacts.</p>
PG	Inductive Loop Defects (Not at a Traffic Signal Installation)	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Broken or operationally degraded Inductive loop</p> <ul style="list-style-type: none"> <li>• damaged pits or conduits.</li> </ul>	<p>Cable pits damaged by environmental, human and vehicular impacts.</p>



Defect Code	Defect Name	Image	Description	Possible Causes
PH	Emergency Phone Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Unsafe, broken and/or operationally degraded emergency phone site.</p>	<p>Handset off holder. Missing, damaged or faulty hardware.</p>
QA	Lighting Switchboard Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Unsafe, unrestricted, broken and/or operationally degraded lighting switchboard. (e.g. failure of switchboard, door open or pillar cover dislodged).</p>	<p>Lighting switchboard is missing or damaged due to environmental, human or vehicular intervention.</p>
QB	Lighting Hardware Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Unsafe, missing, broken and/or operationally degraded lighting hardware (e.g. pole knocked down, luminaire visor / diffuser not secure / hanging or light is displaced / re-aligned).</p>	<p>Lighting hardware is missing or damaged due to environmental, human or vehicular intervention.</p>
QC	Lighting Electrical Defects		<p>Pole or pole hatchway missing, exposed cables in pit, and/or road lighting circuit failure (repairs to circuit in field)</p> <ul style="list-style-type: none"> <li>• Damaged pits or conduits.</li> </ul>	<p>Cable pits damaged by environmental, human and vehicular impacts.</p>



Defect Code	Defect Name	Image	Description	Possible Causes
QD	Lighting General Defects	<p>Source: Transport and Main Roads District Defect Backlog</p>  <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Failed navigation lights connected to a public lighting switchboard. Vegetation shading road lighting. Individual road lighting defect regarding luminaire or mounting, e.g. outreach not correctly aligned / perpendicular, luminaire not horizontal or a single lamp failure (excluding flag or stand-alone emergency stopping bay lighting). Any graffiti, vandalism or unauthorised banners.</p>	<p>Wind damage, vegetation obstruction.</p>
RA	Bridge Defects General - Debris on Bridges	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Debris on bridges that is likely to interrupt the drainage facility, operation of expansion joints or affect the usability of the bridge. Debris on overpass that can be used as projectiles that can be hazardous to travelling public or pedestrians.</p>	<p>Bridge defects caused by environmental, human or vehicular intervention.</p>
SA	Emergency Call Out	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Any reported emergency incidents that likely to create an unsafe situation to road users or likely to damage the road asset.</p>	<p>Ongoing maintenance and testing not carried out in accordance with departmental requirements and standards.</p>



Defect Code	Defect Name	Image	Description	Possible Causes
TA	Bike Path / Lanes Surface Defects	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Accumulation of loose stones, sand or debris on the bike path. Potholes / delamination / isolated slab failure on the bike path. Shoving, depressions, rutting, lumps or ridges on the bike path.</p>	<p>Bike path / lane surface is missing or damaged due to environmental, human or vehicular intervention.</p>
TB	Vegetation Defects - Bike Paths	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Trees, overhanging branches or broken limbs most likely to fall on bike path to be a hazard. Unwanted trees and shrubs or grass obscures in sightlines.</p>	<p>Ongoing maintenance not carried out in accordance with departmental requirements and standards.</p>
TC	Drainage Defects - Bike Paths	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Culverts, pipes and pits defects likely to impact on the integrity of the unit. Obstructed drainage causing water ponding on or adjacent to bike path or private property.</p>	<p>Drainage system not acting in accordance with design. Periodic maintenance not carried out in accordance with departmental guidelines.</p>
TD	Bike Path Defects General	 <p>Source: Transport and Main Roads District Defect Backlog</p>	<p>Damaged bike path fencing creates unsafe riding environment to cyclists. Missing or defective regulatory, warning or guide signs.</p>	<p>Bike path / lane is damaged due to environmental, human or vehicular intervention.</p>

Defect Code	Defect Name	Image	Description	Possible Causes
UA	Pedestrian Crossing / Path Surface Defects	 <p>Source: Transport and Main Roads Image Library</p>	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous to the pedestrian.	Rough surface, any type of trip hazard defect or slippery surface due to loose material and so on.
VA	Inspection Needed	 <p>Source: Transport and Main Roads District Defect Backlog</p>	Additional inspection needed arising from complaints, specific reason or incidents.	Any issue or defect not already covered in this document.

## **4 Chapter 4: Routine Maintenance Intervention Level and Response Time (IL/RT)**

### **4.1 IL/RT model parameters**

#### **4.1.1 Road categories**

With the current levels of maintenance funds, keeping uniform IL/RT across the whole Network is considered unsustainable and with the move to a risk management approach is also considered incorrect. From a road management perspective, the same defect represents a higher risk on a high traffic road than a low traffic road. Therefore, it is logical to have higher maintenance standards for road sections where the traffic volumes are high.

The adoption of road categories will ensure:

- improved consistency across districts
- a transparent, rigorous and rational process for ranking roads for Routine Maintenance purposes
- an ability to develop strategies, funding distributions, condition analysis and reporting for roads of similar importance
- ease in developing intervention standards, prioritisation and funding flow
- tighter intervention standards for high end roads
- improved layout and ease in understanding, and
- ease in comparison.

5 major road maintenance categories are adopted across the whole of the SCRNs based on Annual Average Daily Traffic (AADT) as follows:

- Road Category A: AADT  $\geq$  30,000
- Road Category B: AADT  $\geq$  10,000 &  $<$  30,000
- Road Category C: AADT  $\geq$  500 &  $<$  10,000
- Road Category D: AADT  $\geq$  100 &  $<$  500, and
- Road Category E: AADT  $<$  100.

#### **4.1.2 Corporate Priorities**

Refer to Section 2.1 for details of the Corporate Priorities.

#### **4.1.3 Initial Intervention Level**

Defect's minimum physical dimension or minimum severity, as given in the IL/RT model, that qualifies a defect being considered as Routine Maintenance defect. Such defects must be logged during the inspection cycle as indicated in the Contract Quality Plan or as agreed with the Principal.

#### **4.1.4 Upper Intervention Level**

Maximum desirable physical dimensions or severity of a defect, as provided in the IL/RT model, that can be left on the Network without rectifying. All defects must be rectified before breaching the upper Intervention Level under unconstrained budget. In the case of constrained budget, defects must be prioritised as per IL/RT criteria and rectified.

Upper Intervention Levels indicate the maximum undesirable condition for each defect requiring a Contractor to fix the defect before breaching the upper Intervention Level. However, in some locations on the Network, maintenance should be undertaken for obvious safety reasons before the upper Intervention Level is reached.

These Intervention Levels must be used by the Contractor for recording and rectifying defects that will be subsequently included into the Forward List of Works as an aid to work planning.

These defect Intervention Levels are set out in Section 4.2.

#### **4.1.5 Response Time**

It is required that defects are to be logged once that defect's initial Intervention Level is reached and are to be fixed before breaching its upper Intervention Level. However, due to lack of funding or other practical reasons, some defects may not be rectified before breaching their upper Intervention Limit. Such defects are to be fixed within the allocated Response Time.

Response Time starts when a defect has reached its upper Intervention Limits. If a defect has reached its upper Intervention Limit between 2 inspection cycles, the Response Time starts from the latest inspection date, and therefore completing Network inspections as per the agreed frequency is critically important.

There are no Intervention Levels for some of the defects in the IL/RT model. In such cases, Response Time is started from the day of inspection. For example, Defect Number 60 (LD1\_R) Loose earth, rock in sightline in the IL/RT model.

#### **4.1.6 Defect Code**

A 2-digit Defect Code is used to distinguish the Routine Maintenance defects in the IL/RT model. Below are examples for Defect Codes used in the IL/RT model:

- AA: Isolated Depressions
- DB: Ravelling or Stripping Seal, and
- GA: Wheel Ruts in Unsealed Roadways.

#### **4.1.7 Defect sub code**

Defects are grouped into further levels by considering their physical dimensions or severity levels. There are 6 sub defect types in the IL/RT model:

- H: Defect in Hazardous category
- P: Defect in Ordered Works / Special category
- I: Defect within Intervention Levels
- R: Defect in Response Time category
- M: Defect in monitoring stage, and
- W: Defect to be treated under unsealed roads Work Program.

Below are the examples for typical sub defects:

- AA1\_H: Isolated depression in hazardous category
- DB2\_P: Ravelling or Stripping within Ordered Works / Special category



- AA1\_I: Isolated depression within Intervention Levels
- AA2\_R: Isolated depression in Response Time category
- AA2\_M: Isolated depression in monitoring stage, and
- GA2\_W: Wheel ruts in unsealed roadways to be treated under unsealed roads Work Program.

#### 4.1.8 Defect Scoring

All defects captured during the road inspections are to be prioritised and treated as per Corporate Priorities given in the IL/RT model. Practically, this is a difficult task to carry out due to limited Routine Maintenance funds. For example, once defects have been prioritised, all the safety defects (Corporate Priority 3) may not be fixed due to lack of funding and, as a result, a Contractor does not know which safety defects should be repaired as all defects have the same priority level.

Therefore, it is essential to extend the defect prioritising methodology to prioritise defects that sit in the same Corporate Priority. The Defect Scoring methodology in IL/RT model enables Contractors to prioritise defects even within the Corporate Priorities. However, this Defect Scoring methodology is not applicable to Corporate Priority 1 and 2 defects, which are Hazardous defects and Ordered Works / Special defects.

Code Score provided in the IL/RT model is applicable for Hazardous and Ordered Works / Special defects, which are 20 and 18 respectively.

Defect ranking score, which is called Corporate Score, is the combination of Corporate Priority Weighting, Field Weighting and Location Score as given below:

Corporate Score = Corporate Priority Weighting + Field Weighting + Location Score

Corporate Score can vary from 2 to 17, depending on the Corporate Weighting, Field Weighting and Location Score.

**Table 4.1.8 – Defect Scoring**

Defect Type	Corporate Priority	Corporate Priority Weighting (A)	Field Weighting (B)	Location Score (C)	Code Score (A+B)	Corporate Score (A+B+C)
Hazard	1	10	10	Nil	20	20
Ordered Works / Special	2	9	9	Nil	18	18
Safety	3	1 to 5	1 to 4	2, 3, 4, 6 or 8	2 to 9	4 to 17
Legislative	4					
Preventative	5					
Appearance / Usability	6					

#### Corporate Priority Weighting

Corporate Priority Weighting is based on road user safety and the appropriate weighting is allocated to all defects in the IL/RT model. Corporate Priority Weighting can vary from 1 to 5.

### **Field Weighting**

Field Weighting to be allocated by the inspectors during the defect logging cycle. The Field Weighting must be allocated purely based on the defects' impact on the road asset deterioration. Field Weighting varies from 1 to 4, as per below impact on the road asset:

- Asset rapid deterioration due to defect – 4
- Asset moderate deterioration due to defect – 3
- Asset low deterioration due to defect – 2, and
- The defect is in the monitoring stage – 1.

### **Location Score**

Location Score is allocated varying from 2 to 8 based on the road category; as given below:

- Road category A – 8
- Road category B – 6
- Road category C – 4
- Road category D – 3, and
- Road category E – 2.

#### **4.1.9 Hazardous defects identification and management procedure**

##### **4.1.9.1 Identification and risk assessment (determining whether defect is a danger or hazard)**

When a defect is identified (following inspection, complaint, notification by the Principal or otherwise), determine whether the defect constitutes an immediate danger or hazard to traffic, road users or other members of the public or is likely to become a danger or hazard before the expiry of the time during which it would be rectified in the normal course of events.

If it is unlikely that a hazardous situation exists, the emergency crew should not be mobilised until the relevant inspector / back logger has determined that this is the appropriate type of response required given the circumstances.

The risk assessment procedure is provided as a guide. This is intended to provide assistance in determining whether the defect constitutes an immediate danger or hazard.

In determining if a defect is or is likely to become a danger or a hazard to the road users or general public, the following must be considered as a minimum following a likelihood risk assessment procedure (Table 4.1.9.1(a) and Table 4.1.9.1(b)):

1. Severity and nature of the defect, and
2. Extent of defect (combined effect of multiple occurrences of the defect within localised area).

The Hazardous defect identification procedure should only be used for the safety defects where upper Intervention Limit is exceeded. Therefore, safety defects in Response Time stage are only qualified to proceed with the Hazardous defects identification procedure.

An Inspector can override the Hazardous defects identification procedure to turn a non-Hazardous defect into a Hazardous defect due to specific reasons or local conditions. The Inspector must have reasonable facts to justify his / her decision. However, Inspectors cannot override the Hazardous defects identification procedure to turn a Hazardous defect into a non-Hazardous defect.

### Likelihood

Likelihood of exposure to a defect is dependent on the number of factors which are given in the below Table 4.1.9.1(a). Likelihood of exposure to a defect determines a crash / accident. Likelihood is high when these individual factors' severities are high. For example, likelihood is high when AADT is greater than 50,000 compared to when AADT is less than 10,000.

In order to achieve a reasonable assessment, all likelihood factors are grouped into sub groups and allocated appropriate points. Inspectors are required to select the relevant sub group of the likelihood factors and allocate scores accordingly during the Hazardous defects identification process.

If total likelihood score is greater than or equal to 22, then the defect is considered as a Hazardous defect (Table 4.1.9.1(b)). In such situations, Hazardous defects management procedure given in Section 4.1.9.2 must be followed.

**Table 4.1.9.1(a) – Factors contributing to a defect becoming Hazardous**

<b>Routine Maintenance Hazardous Defects Identification Methodology based on likelihood of exposure to a defect</b>	
<b>Safety defects where Intervention Levels above upper limits are only qualified to be evaluated in this form</b>	
<b>Likelihood Factors</b>	<b>Score</b>
<b>Traffic Volumes (AADT)</b>	
≥ 50,000	5
≥ 10,000 < 50,000	3
≥ 2,500 < 10,000	2
< 2,500	1
<b>Speed Environment (km/hr)</b>	
≥ 100	6
≥ 80 < 100	4
≥ 60 < 80	2
< 60	1
<b>Location (lateral position)</b>	
Within lanes	5
Adjacent to wheelpath	3
Shoulder	1
Off Carriageway	0
<b>Visibility due to road geometry</b>	
Unable to react prior to defect (Within lanes or adjacent to wheel path)	5
Unable to react prior to defect (Shoulder)	2

<b>Routine Maintenance Hazardous Defects Identification Methodology based on likelihood of exposure to a defect</b>	
<b>Safety defects where Intervention Levels above upper limits are only qualified to be evaluated in this form</b>	
<b>Likelihood Factors</b>	<b>Score</b>
Unable to react prior to defect (Other)	1
Other	0
<b>Road Configuration</b>	
Undivided	2
Divided	1
<b>Trafficable width per carriageway</b>	
≤ 6m	3
> 6m ≤ 8m	2
> 8m	1
<b>Heavy Vehicles</b>	
≥ 1000	5
≥ 100 < 1000	3
< 100	1
<b>Percent Exceed</b>	
> 200%	6
> 150% < 200%	4
> 100% < 150%	2
<b>Defect Isolation</b>	
Isolated defect within lanes	5
Isolated defect adjacent to wheel path	3
Isolated defect shoulder	2
Isolated defect off carriageway	1
Non-isolated defect	0
<b>Threshold value for Hazardous defect</b>	<b>22</b>



**Table 4.1.9.1(b) – Hazardous defects identification**

Total likelihood scores as per Table 4.1.9.1(a)	Total likelihood scores	
	Less than 22	Greater than or equal to 22
	Not a hazard	Hazard

#### 4.1.9.2 Hazardous Defects Management

##### Hazard Action

Below are the recommended hazard actions to be taken by the Inspector or the authorised maintenance personnel when a Hazardous defect has been identified on the Network. However, these actions may vary from district to district based on the local circumstances or local emergency management procedures.

##### Time allowed to assess need for emergency action

Inspector or authorised maintenance personnel must assess the need for emergency action within the following times:

1. During normal working times – 5 minutes plus normal travel time to site, and
2. Outside normal working times – 10 minutes plus normal travel time to site.

##### Time allowed to mobilise crew and start work

If the defect creates an immediate danger or hazard to traffic, take all steps reasonably available to rectify or remove the defect or hazard. A crew must be called out or reassigned as soon as possible in accordance with this section.

The time to mobilise and start work on-site commences after the Inspector or authorised maintenance personnel has determined that an emergency response is necessary.

Mobilise a crew and start work on-site within:

- During normal working times – 20 minutes plus normal travel time to site, and
- Outside normal working times – 40 minutes plus normal travel time to site.

##### Take all actions necessary to safeguard road users

At the Site of any hazard, undertake necessary work to make the Site safe and trafficable. If it is not possible to rectify or remove the defect immediately upon identification, take all measures reasonably necessary to safeguard road users and others, including the erection of warning signs, barriers and the provision of traffic control, until such time as repair or removal can be effected or a relevant authority directs otherwise.

Complete the rectification of the defect in accordance with the applicable rectification standards as soon as practicable. The rectification standards may not be the Maintenance Activity Standards for all Hazardous defects / situations on the Network.

### **Alternative emergency action**

If it is not possible to provide any measures required under this section at the time when the defect, hazard or incident is identified, the Inspector or authorised maintenance personnel must:

- Immediately notify the local Police and request assistance (for a defect constituting an immediate danger), or
- Arrange measures or action within a reasonable timeframe in order to protect person and property.

Advise the Principal of defects, hazard or incidents where the inspector or authorised maintenance personnel was unable to immediately dispatch the necessary resources.

This sub- section is intended to apply only in exceptional circumstances where the inspector or authorised maintenance personnel is genuinely unable to respond due to resource constraints and the need to meet competing priorities, which are beyond their reasonable control. Nothing in this section is intended to limit the inspector or authorised maintenance personnel emergency response obligations.

### **Incident Response**

In an emergency, advise the appropriate emergency response agency and request assistance:

- For injured persons, contact the Queensland Ambulance Service.
- For bush fires, contact appropriate firefighting authority (either Queensland Fire Brigade, Rural Fire Brigade, fire control officer of the Forestry Commission or the National Parks and Wildlife Services).
- For hazardous materials, contact the Queensland Fire Brigade.
- For pollution incidents, contact the Queensland Environment Protection Authority, and
- For stray animals, contact the police.

Promptly advise the Traffic Management Centre (TMC) of the following incidents:

- A fatal accident
- Known or suspected hazardous material spillage
- Significant delays (> 15 minutes) to traffic, and
- Illegally parked, abandoned or unattended vehicles hazardous to or obstructing traffic or pedestrian movement.

4.2 Routine Maintenance Intervention Level and Response Time (IL/RT) criteria

Table 4.2 – Routine Maintenance Intervention Level and Response Time (IL/RT) criteria

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																							
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category		Cat A vpd > 30000		Cat B vpd 10000-30000		Cat C vpd 500-10000		Cat D vpd 100-500		Cat E vpd < 100		Maintenance Activity Number	Remarks					
					Location Score (C)		8		6		4		3		2								
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score															
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)		
<b>Defect Category 01 - Deformation and Potholes in Bituminous Surface</b>																							
<b>1</b>	<b>AA</b>	<b>Isolated Depressions and Bumps in Bituminous Surface</b>																					
	AA1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard											110 111 161 155 157 169 143 144 112 141 113 129 146 147 148 139 140	See Hazard Procedure			
	AA2_I	Area of ponding of water (not free draining) in the wheel path exceeds 3 m <sup>2</sup> (free draining means water disperses without action of traffic).	3 m <sup>2</sup>	3 - Safety	2		2	5 m <sup>2</sup>	10	10 m <sup>2</sup>	8	15 m <sup>2</sup>	6	20 m <sup>2</sup>	5	20 m <sup>2</sup>	4						
	AA2_R	Area of ponding of water (not free draining) in the wheel path the exceeds upper Intervention Level in AA2_I (free draining means water disperses without action of traffic).	Upper IL	3 - Safety	3		3	4 weeks	11	2 months	9	3 months	7	4 months	6	6 months	5						
	AA3_I	Depression or bump on sealed pavements measured using a 1.2 m straight edge exceeds 20 mm.	20 mm	3 - Safety	2		2	30 mm	10	40 mm	8	50 mm	6	75 mm	5	100 mm	4						

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	AA3_R	Depression or bump on sealed pavements measured using a 1.2 m straight edge exceeds upper Intervention Level in AA3_I.	Upper IL	3 - Safety	4		4	4 weeks	12	4 weeks	10	3 months	8	4 months	7	6 months	6	
	AA4_M	Depression or bump on sealed pavements measured using a 1.2 m straight edge is less than 20 mm.	20 mm	5 - Preventative	1		1	Log the defect and monitor if ponding area is greater than 1 m <sup>2</sup> or depth exceeds 10 mm										
<b>2</b>	<b>AB</b>	<b>Ruts in Bituminous Surface</b>																
	AB1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard									110 111 145 146 155 157 160 169 112 151 152 113 137 138 153 154 139 140 143 144	See Hazard Procedure
	AB2_I	Area of ponding of water (not free draining) in the wheel path exceeds 3 m <sup>2</sup> (free draining means water disperses without action of traffic).	3 m <sup>2</sup>	3 - Safety	3		3	5 m <sup>2</sup>	11	10 m <sup>2</sup>	9	15 m <sup>2</sup>	7	20 m <sup>2</sup>	6	20 m <sup>2</sup>	5	
	AB2_R	Area of ponding of water (not free draining) in the wheel path exceeds the upper Intervention Level in AB2_I (free draining means water disperses without action of traffic).	Upper IL	3 - Safety	5		5	4 weeks	13	2 months	11	3 months	9	4 months	8	6 months	7	
	AB3_I	Depth of rut on sealed pavements measured laterally from top of ridge using a 1.2 m straight edge exceeds 20 mm.	20 mm	3 - Safety	2		2	30 mm	10	40 mm	8	50 mm	6	75 mm	5	100 mm	4	



Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			8	6	4	3	2						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	AB3_R	Depth of rut on sealed pavements measured laterally from top of ridge using a 1.2 m straight edge exceeds the upper Intervention Level in AB3_I.	Upper IL	3 - Safety	4		4	4 weeks	12	4 weeks	10	3 months	8	4 months	7	6 months	6	
	AB4_M	Depth of rut on sealed pavements measured laterally from top of ridge using a 1.2 m straight edge is less than 20 mm.	20 mm	5 - Preventative	1		1	Log the defect and monitor if ponding area is greater than 1 m <sup>2</sup> or depth exceeds 10 mm										
<b>3</b>	<b>AC</b>	<b>Shoving of Pavement or Asphalt</b>																
	AC1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard									140 169 143 144 141 151 152 113 129 145 146 147 148 153 154 110 111 139	See Hazard Procedure
	AC2_I	Area of ponding of water (not free draining) in the wheel path exceeds 3 m <sup>2</sup> :(free draining means water disperses without action of traffic).	3 m <sup>2</sup>	3 - Safety	3		3	5 m <sup>2</sup>	11	10 m <sup>2</sup>	9	15 m <sup>2</sup>	7	20 m <sup>2</sup>	6	20 m <sup>2</sup>	5	
	AC2_R	Area of ponding of water (not free draining) in the wheel path exceeds the upper Intervention Level in AC2_I (free draining means water disperses without action of traffic).	Upper IL	3 - Safety	5		5	4 weeks	13	4 weeks	11	3 months	9	4 months	8	6 months	7	
	AC3_I	Height / depth of shove on sealed pavements measured laterally from top of ridge using a 1.2 m straight edge exceeds 20 mm.	20 mm	3 - Safety	2		2	50 mm	10	75 mm	8	75 mm	6	100 mm	5	100 mm	4	

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100							
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)
	AC3_R	Height / depth of shove on sealed pavements measured laterally from top of ridge using a 1.2 m straight edge exceeds the upper Intervention Level in AC3_I.	Upper IL	3 - Safety	4		4	4 weeks	12	4 weeks	10	3 months	8	4 months	7	6 months	6		
	AC4_M	Height / depth of shove on sealed pavements measured laterally from top of ridge using a 1.2 m straight edge is less than 20 mm.	20 mm	5 - Preventative	1		1	Log the defect and monitor if ponding area is greater than 1 m <sup>2</sup> or depth exceeds 10 mm											
	AC5_I	Height / depth of shove on sealed pavements measured longitudinally from top of ridge using a 1.2 m straight edge exceeds 50 mm.	50 mm	3 - Safety	3		3	75 mm	11	100 mm	9	125 mm	7	125 mm	6	150 mm	5		
	AC5_R	Height / depth of shove on sealed pavements measured longitudinally from top of ridge using a 1.2 m straight edge exceeds the upper Intervention Level in AC5_I.	Upper IL	3 - Safety	5		5	2 days	13	1 week	11	2 weeks	9	4 weeks	8	5 weeks	7		
	AC6_M	Height / depth of shove on sealed pavements measured longitudinally from top of ridge using a 1.2 m straight edge is less than 50 mm.	50 mm	5 - Preventative	1		1	Log the defect and monitor if depth exceeds 30 mm											
<b>4</b>	<b>AD</b>	<b>Very Rough Surface (Isolated Sections) in Bituminous Surface</b>																	
	AD1_H	Any verified defect (not meeting the requirements of AA, AB, AD or AG) identified by inspections or complaint that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										110 107 111 143 161 145 155 157 160 169 112 151 152 113 146 146 147 148 153 154	See Hazard Procedure

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			8	6	4	3	2						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT
<b>5</b>	<b>AE</b>	<b>Potholes / Delamination in Bituminous Surface</b>																
	AE1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard									105 106 107 142 146	See Hazard Procedure
	AE2_I	Plan dimension on sealed pavements exceeds 100 mm.	100 mm	3 - Safety	3		3	300 mm	11	400 mm	9	500 mm	7	500 mm	6	600 mm	5	
	AE2_R	Plan dimension on sealed pavements exceeds the upper Intervention Level in AG2_I.	Upper IL	3 - Safety	5		5	24 hours	13	1 week	11	2 weeks	9	3 weeks	8	4 weeks	7	
	AE3_M	Plan dimension on sealed pavements is less than 100 mm.	100 mm	5 - Preventative	1		1	Log the defect and monitor if plan dimension exceeds 50 mm										
	AE4_I	Depth on sealed pavements exceeds 30 mm.	30 mm	3 - Safety	3		3	40 mm	11	40 mm	9	50 mm	7	60 mm	6	80 mm	5	
	AE4_R	Depth on sealed pavements exceeds the upper Intervention Level in AG4_I.	Upper IL	3 - Safety	5		5	24 hours	13	1 week	11	2 weeks	9	3 weeks	8	4 weeks	7	
	AE5_M	Depth on sealed pavements is less than 30 mm.	30 mm	5 - Preventative	1		1	Log the defect and monitor if depth exceeds 20 mm										
	AE6_P	Any pothole in the wearing surface that results in the loss of material under traffic.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal										
<b>Defect Category 02 - Cracks in Bituminous Surface</b>																		
<b>6</b>	<b>BA</b>	<b>Crocodile Cracking in Bituminous Surface</b>																
	BA1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard									145 146 122	See Hazard Procedure
	BA2_M	Plate size is less than 100 mm.	100 mm	5 - Preventative	1		1	Log the defect and monitor if plate size exceeds 50 mm									143 144 120 139	
	BA3_R	Moisture is entering / leaving the pavement.	N/A	5 - Preventative	1		1	9 months	9	9 months	7	12 months	5	12 months	4	12 months	3	

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100							
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)
<b>7</b>	<b>BB</b>	<b>Bituminous Surface Cracks General</b>																	
	BB1_H	Cracking that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										120 123 118 117 115 122 121 101 110 111 112 139	See Hazard Procedure
	BB2_R	Individual crack width exceeds 3 mm or fine pumping.	3 mm	5 - Preventative	1		1	9 months	9	9 months	7	12 months	5	12 months	4	12 months	3	Manage at local level (6 months or before wet weather)	
<b>Defect Category 03 - Edge Defects Bituminous Surface</b>																			
<b>8</b>	<b>CA</b>	<b>Edge Break in Bituminous Surface</b>																	
	CA1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										101 102 103 169 139 140 221	See Hazard Procedure
	CA2_I	Unsealed shoulder: From the average existing seal width, edge break exceeds 75 mm.	75 mm	3 - Safety	1		1	N/A	9	100 mm	7	125 mm	5	150 mm	4	150 mm	3	Edge break with narrow lanes (less than 3 m wide lanes) to be prioritised on case to case basis	
	CA2_R	Unsealed shoulder: From the average existing seal width, edge break exceeds the upper Intervention Level in CA2_I.	Upper IL	3 - Safety	2		2	N/A	10	4 weeks	8	4 weeks	6	4 weeks	5	4 weeks	4		
	CA3_M	Unsealed shoulder: From the average existing seal width, edge break is less than 75 mm.	75 mm	5 - Preventative	1		1	Log the defect and monitor if depth exceeds 30 mm											



Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																				
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks						
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100								
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score												
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	CA4_I	Sealed shoulder (at least 500 mm width): From the average existing seal width, measured from each side of the seal (from shoulder end), edge break exceeds 100 mm or encroaching into the edge line of road.	100 mm	3 - Safety	2		2	125 mm	10	125 mm	8	125 mm	6	150 mm	5	150 mm	4			
	CA4_R	Sealed shoulder (at least 500 mm width): From the average existing seal width, measured from each side of the seal (from shoulder end), edge break exceeds the upper Intervention Level in CA4_I or encroaching into the edge line of road.	Upper IL	3 - Safety	3		3	4 weeks	11	4 weeks	9	4 weeks	7	4 weeks	6	6 weeks	5			
	CA5_M	Sealed shoulder (at least 500 mm width): From the average existing seal width, measured from each side of the seal (from shoulder end), edge break is less than 100 mm and not encroaching into the edge line of road.	100 mm	5 - Preventative	1		1	Log the defect and monitor if deviation exceeds 70 mm												
<b>9</b>	<b>CB</b>	<b>Edge Drop off in Bituminous Surface</b>																		
	CB1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard											101 102 103 169 215 221 222 216 217 218 219 229 139	See Hazard Procedure
	CB2_I	Unsealed shoulder: Depth of edge drop-off measured using a 1.2 m straight edge as vertical distance from the surface at edge of seal to the surface of the shoulder exceeds 40 mm.	40 mm	3 - Safety	2		2	N/A	N/A	60 mm	8	75 mm	6	75 mm	5	75 mm	4	Edge drop-off with narrow lanes (less than 3 m wide lanes) to be prioritised on case to case basis		
	CB2_R	Unsealed shoulder: Depth of edge drop-off measured using a 1.2 m straight edge as vertical distance from the surface at edge of seal to the surface of the shoulder exceeds the upper Intervention Level in CC2_I.	Upper IL	3 - Safety	4		4	N/A	N/A	4 weeks	10	2 months	8	2 months	7	2 months	6			

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																				
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks						
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100								
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score												
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	CB3_I	Sealed shoulder (at least 0.5 m width): Depth of edge drop-off measured using a 1.2 m straight edge as vertical distance from the surface at edge of seal to the surface of the shoulder exceeds 40 mm.	40 mm	3 - Safety	3		3	50 mm	11	60 mm	9	75 mm	7	75 mm	6	75 mm	5			
	CB3_R	Sealed shoulder (at least 0.5 m width): Depth of edge drop-off measured using a 1.2 m straight edge as vertical distance from the surface at edge of seal to the surface of the shoulder exceeds the upper Intervention Level in CC3_I.	Upper IL	3 - Safety	4		4	4 weeks	12	4 weeks	10	2 months	8	2 months	7	2 months	6			
	CB4_M	Edge drop-off measured using a 1.2 m straight edge as vertical distance from the surface at edge of seal to the surface of the shoulder is less than 40 mm.	40 mm	5 - Preventative	1		1	Log the defect and monitor if depth exceeds 30 mm												
Defect Category 04 - Surface Texture Deficiencies Bituminous Surface																				
10	DA	Flushing, Bleeding Seal																		
	DA1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard											118 117 119 139	See Hazard Procedure
	DA2_R	Bleeding leads to bitumen pick up on vehicle tyres likely to result in complaints.	N/A	3 - Safety	5		5	1 day	13	1 day	11	1 day	9	1 day	8	2 days	7			
	DA3_P	Any fatty strips greater than 10 m on a horizontal curve or approach to a curve or within an intersection or 15 m on straights or 10% of lane km is fatty.	10 m	2 - Ordered Work / Special	9	9	18	As advised by Principal												
11	DB	Ravelling or Stripping Seal																		
	DB1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard											118 155	See Hazard Procedure
	DB2_P	Any ravelling on a horizontal curve or approach to or within an intersection exceeds 5 m <sup>2</sup> .	5 m <sup>2</sup>	2 - Ordered Work / Special	9	9	18	As advised by Principal											117 115 114	
	DB3_R	Any stripping in an area exceeds 10 m <sup>2</sup> .	10 m <sup>2</sup>	5 - Preventative	1		1	Log the defect monitor and inform to Principal											119	
	DB4_R	Any ravelling or stripping where the gravel pavement visibility exceeds 1 m <sup>2</sup> .	1 m <sup>2</sup>	5 - Preventative	1		1	Log the defect monitor and inform to Principal											139	

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100							
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)
<b>12</b>	<b>DC</b>	<b>Other Bituminous Surface Texture Defects</b>																	
	DC1_M	Safety problem exists where loss of skid resistance is evident and/or complaint received regarding excessive surface noise.	N/A	3 - Safety	1		1	Log the defect monitor and inform to Principal										118 155 117 115 119 139	
<b>Defect Category 05 - Other Bituminous Surface</b>																			
<b>13</b>	<b>EA</b>	<b>Loose Stones or Debris on Sealed Roadway</b>																	
	EA1_H	Any verified defect (debris, foreign material, loose stones, litter on roadway) identified by inspections, complaint or notification by Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										130 423 135	See Hazard Procedure
	EA2_R	Any verified defect (debris, foreign material, loose stones, litter) identified by inspections, complaint or notification by Principal that is unsafe.	N/A	3 - Safety	5		5	1 week	13	1 week	11	4 weeks	9	4 weeks	8	4 weeks	7		
<b>14</b>	<b>EB</b>	<b>Grass on Sealed Roadway</b>																	
	EB1_R	Control of vegetation growth around kerb and channel, along fence lines and on the road pavement that create unsafe road condition.	N/A	3 - Safety	5		5	3 days	13	3 days	11	2 weeks	9	4 weeks	8	6 weeks	7	407 135	
	EB2_R	Control of vegetation growth around kerb and channel, along fence lines and on the road pavement.	N/A	6 - Appearance / Usability	2		2	12 months	10	12 months	8	12 months	6	12 months	5	12 months	4		
<b>15</b>	<b>EC</b>	<b>Dead Animals on Roadway</b>																	
	EC1_H	Dead animals on roadway that are hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										429	See Hazard Procedure
	EC2_R	Dead animals on roadway.	N/A	3 - Safety	5		5	1 day	13	1 week	11	1 week	9	4 weeks	8	4 weeks	7		
<b>16</b>	<b>ED</b>	<b>Rough Manhole Covers and Grates (Rough Service Access Facility)</b>																	
	ED1_H	Any verified defect (tolerance relative to surrounding ground etc) identified by inspection, complaint or notification by Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										139	See Hazard Procedure
	ED2_I	Height or depth relative to surrounding ground exceeds 20 mm.	20 mm	3 - Safety	4		4	30 mm	12	30 mm	10	40 mm	8	40 mm	7	50 mm	6		

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																				
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category		Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks							
							vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100									
					Location Score (C)		8	6	4	3	2									
					Corporate Priorities and Defect Scoring		Upper Intervention Level: Maximum Response Time: Defect Final Score													
				Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)				
	ED2_R	Height or depth relative to surrounding ground exceeds the upper Intervention Level in EE2_I.	Upper IL	3 - Safety	5		5	4 weeks	13	4 weeks	11	6 weeks	9	8 weeks	8	8 weeks	7			
<b>17</b>	<b>EE</b>	<b>Debris on Sealed Shoulders</b>																		
	EE1_H	Any verified defect (debris / foreign material / litter on sealed surface) identified by inspection, complaint or notification by Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										135 423	See Hazard Procedure	
	EE2_M	Any verified defect (debris / foreign material / litter on sealed surface) identified by inspection, complaint or notification by Principal that is unsafe.	N/A	3 - Safety	1		1	Log the defect monitor and inform to Principal												
<b>18</b>	<b>EF</b>	<b>Depressions Service Reinstatement (Rough Service Trench Reinstatement)</b>																		
	EF1_H	Any verified defect identified by inspection, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										110 111 112 430	See Hazard Procedure	
	EF2_I	Depth of depression using a 1.2 m straight edge exceeds 20 mm.	20 mm	3 - Safety	3		3	40 mm	11	40 mm	9	50 mm	7	60 mm	6	80 mm	5			
	EF2_R	Depth of depression using a 1.2 m straight edge exceeds the upper Intervention Level in EB2_I.	Upper IL	3 - Safety	4		4	24 hours	12	1 week	10	2 weeks	8	3 weeks	7	4 weeks	6			
<b>Defect Category 06 - Unsealed Shoulder Defects</b>																				
<b>19</b>	<b>FA</b>	<b>Insufficient (Adverse) Crossfall in Unsealed Shoulder</b>																		
	FA1_H	Any verified defect identified by inspection, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	As a hazard										215 221 222 216 217 218 219 229	See Hazard Procedure
	FA2_I	Area of ponding of water (not free draining) in the wheel path exceeds 3 m <sup>2</sup> (free draining means water disperses without action of traffic.	3 m <sup>2</sup>	3 - Safety	2		2	N/A	N/A	10 m <sup>2</sup>	8	15 m <sup>2</sup>	6	20 m <sup>2</sup>	5	20 m <sup>2</sup>	4			



Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)			8	6	4	3	2							
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)		
	FA2_R	Area of ponding of water (not free draining) in the wheel path exceeds the upper Intervention Level in FA2_I (free draining means water disperses without action of traffic).	Upper IL	3 - Safety	3		3	N/A	N/A	2 months	9	3 months	7	4 months	6	6 months	5		
	FA3_M	The defect causing water ponding on pavement edge or on shoulder.	N/A	5 - Preventative	1		1	Log the defect and monitor if plan dimension exceeds 1 m <sup>2</sup>											
<b>20</b>	<b>FB</b>	<b>Excessive Crossfall in Unsealed Shoulder</b>																	
	FB1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is likely to become hazardous.	N/A	1 - Hazard	10	10	20	N/A	As a hazard									215 221 222 216 217 218 219 229	See Hazard Procedure
	FB2_I	Pavement without superelevation: the crossfall of shoulders is less than 6%.	6%	5 - Preventative	1		1	N/A	N/A	10%	7	10%	5	10%	4	10%	3		
	FB3_I	Pavement with superelevation: low side of pavements: the crossfall of shoulders is less than 6%.	6%	5 - Preventative	1		1	N/A	N/A	10%	7	10%	5	10%	4	10%	3		
	FB4_I	Pavement with superelevation: high side of pavements, the difference between the crossfall of the shoulder and the crossfall of the adjacent pavement is less than 3%.	3%	5 - Preventative	1		1	N/A	N/A	7%	7	7%	5	7%	4	7%	3		
	FB5_I	Pavement with superelevation: high side of pavements, the difference between the crossfall of the shoulder and the crossfall of the adjacent pavement is less than -1%.	1%	5 - Preventative	1		1	N/A	N/A	-5%	7	-5%	5	-5%	4	-5%	3		
<b>21</b>	<b>FC</b>	<b>Lateral Scour Channels in Unsealed Shoulders</b>																	
	FC1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is likely to become hazardous.	N/A	1 - Hazard	10	10	20	N/A	As a hazard									215 221 222 216 217 218 229 219	See Hazard Procedure

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																				
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks						
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100								
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score												
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	FC2_I	Where the seal width is less than 6 m, the depth exceeds 40 mm.	40 mm	3 - Safety	3		3	N/A	N/A	N/A	N/A	100 mm	7	125 mm	6	125 mm	5			
	FC2_R	Where the seal width is less than 6 m, the depth exceeds the upper Intervention Level in FC2_I.	Upper IL	3 - Safety	4		4	N/A	N/A	N/A	N/A	6 weeks	8	2 months	7	3 months	6			
	FC3_M	Where the seal width is less than 6 m, the depth is less than 40 mm.	40 mm	5 - Preventative	2		2	Log the defect and monitor if depth exceeds 20 mm								2				
	FC4_I	Where the seal width is 6-8 m, the depth exceeds 40 mm.	40 mm	5 - Preventative	2		2	N/A	N/A	75 mm	8	100 mm	6	125 mm	5	150 mm	4			
	FC5_M	Where the seal width is greater than 8 m, the depth exceeds 60 mm.	60 mm	5 - Preventative	2		2	Log the defect and monitor if depth exceeds 20 mm												
<b>22</b>	<b>FD</b>	<b>Hazardous Dry Loose Material in Unsealed Shoulders</b>																		
	FD1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A	As a hazard								215 221 222 216 217 218 219 229	See Hazard Procedure	
	FD2_I	Loose shoulder material depth exceeds 40 mm.	40 mm	3 - Safety	2		2	N/A	N/A	75 mm	8	75 mm	6	100 mm	5	125 mm	4			
	FD2_R	Loose shoulder material depth exceeds the upper Intervention Level in FE2_I.	Upper IL	3 - Safety	3		3	N/A	N/A	4 weeks	9	4 weeks	7	2 months	6	3 months	5			
<b>23</b>	<b>FE</b>	<b>Ruts in Unsealed Shoulders</b>																		
	FE1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is likely to become hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A	As a hazard								215 221 222 216 217 218 219 229	See Hazard Procedure	

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																						
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks								
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100										
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score														
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)			
	FE2_I	Where the seal width is less than 6 m, the depth exceeds 75 mm.	75 mm	3 - Safety	2		2	N/A	N/A	N/A	N/A	100 mm	6	150 mm	5	200 mm	4					
	FE2_R	Where the seal width is less than 6 m, the depth exceeds upper Intervention Level in FH2_I.	Upper IL	3 - Safety	4		4	N/A	N/A	N/A	N/A	6 weeks	8	2 months	7	3 months	6					
	FE3_M	Where the seal width is less than 6 m, the depth is less than 75 mm.	75 mm	5 - Preventative	2		2	Log the defect and monitor if depth exceeds 50 mm														
	FE4_I	Where the seal width is 6-8 m, the depth exceeds 75 mm.	75 mm	5 - Preventative	1		1	N/A	N/A	75 mm	7	150 mm	5	200 mm	4	250 mm	3					
	FE5_M	Where the seal width is greater than 8 m, the depth exceeds 100 mm.	100 mm	5 - Preventative	1		1	Log the defect and monitor if depth exceeds 50 mm														
<b>24</b>	<b>FF</b>	<b>Debris on Unsealed Shoulder</b>																				
	FF1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A	As a hazard											215 221 222	See Hazard Procedure
	FF2_I	Any debris on shoulder exceeds 40 mm in height.	40 mm	3 - Safety	2		2	N/A	N/A	75 mm	8	75 mm	6	100 mm	5	125 mm	4	216 217 218 219 229				
	FF2_R	Any debris on shoulder exceeds upper Intervention Level in FG2_I.	Upper IL	3 - Safety	3		3	N/A	N/A	4 weeks	9	4 weeks	7	2 months	6	3 months	5	230 231 130 135				
	FF3_M	Any debris, build-up materials create water ponding on unsealed shoulder area exceeding 2 m <sup>2</sup> .	2 m <sup>2</sup>	5 - Preventative	1		1	Log the defect and monitor if depth exceeds 50 mm														

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100							
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)		
<b>25</b>	<b>FG</b>	<b>Reduced Shoulder Width in Unsealed Shoulders</b>																	
	FG1_I	Reduction of shoulder design width in general vicinity exceeds 20%.	20%	5 - Preventative	2		2	N/A	N/A	30%	8	30%	6	30%	5	30%	4	215 221 222 216 217 218 219 229 230 231	
<b>26</b>	<b>FH</b>	<b>Potholes in Unsealed Shoulder</b>																	
	FH1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A	As a hazard							220	See Hazard Procedure	
	FH2_I	Depth of isolated holes exceeds 60 mm in 2 m.	60 mm	3 - Safety	2		2	N/A	N/A	100 mm	8	125 mm	6	150 mm	5	150 mm	4		
	FH2_R	Depth of isolated holes exceeds upper Intervention Level in FL2_I.	Upper IL	3 - Safety	3		3	N/A	N/A	4 weeks	9	4 weeks	7	2 months	6	3 months	5		
<b>27</b>	<b>FI</b>	<b>Shoulder Defects, General</b>																	
	FI1_P	Any shoulder defects likely to creates unsafe road condition to travelling public or accelerates shoulder deterioration.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal									215 221 222 216 217 218 219 229 230 231 169		

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category		Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)		8	6	4	3	2							
					Corporate Priorities and Defect Scoring		Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)			Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
<b>Defect Category 07 - Unsealed Roadway Defects</b>																		
<b>28</b>	<b>GA</b>	<b>Wheel Ruts in Unsealed Roadways</b>																
	GA1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A			204 201 206 203 202 208 207 214	See Hazard Procedure					
	GA2_I	Depth of wheel ruts using a 1.2 m straight edge (measured valley to crest in case of ruts) exceeds 80 mm.	80 mm	3 - Safety	4		4	N/A	N/A	N/A	N/A		As a part of programmed Works*					
	GA3_W	Depth of wheel ruts exceeds upper Intervention Level in GA2_I.	80 mm	5 - Preventative	4		4	N/A	N/A	N/A	N/A		As a part of programmed Works*					
<b>29</b>	<b>GB</b>	<b>Shoving in Unsealed Roadways</b>																
	GB1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A			204 201 206	See Hazard Procedure					
	GB2_I	Depth of wheel ruts using a 1.2 m straight edge (measured valley to crest in case of ruts) exceeds 80 mm.	80 mm	3 - Safety	4		4	N/A	N/A	N/A	N/A		As a part of programmed Works*					
	GB3_W	Depth of shoves using a 1.2 m straight edge (measured valley to crest in case of shoves) exceeds 80 mm.	80 mm	5 - Preventative	4		4	N/A	N/A	N/A	N/A		As a part of programmed Works*					
<b>30</b>	<b>GC</b>	<b>Potholes in Unsealed Roadways</b>																
	GC1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A	N/A	N/A		204 201 206	See Hazard Procedure				
	GC2_W	Any potholes.	N/A	5 - Preventative	3		3	N/A	N/A	N/A	N/A		203 202 208 207 214	As a part of programmed Works*				



Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category		Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)		vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100							
					Corporate Priorities and Defect Scoring		Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)			Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
<b>31</b>	<b>GD</b>	<b>Insufficient Crossfall in Unsealed Roadways</b>																
	GD1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A	N/A	N/A	As a hazard		204 201 205	See Hazard Procedure			
	GD2_W	Any insufficient crossfall.	N/A	5 - Preventative	1		1	N/A	N/A	N/A	N/A	As a part of programmed Works*		203 202 208				
<b>32</b>	<b>GE</b>	<b>Excessive Crossfall in Unsealed Roadways</b>																
	GE1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A	N/A	N/A	As a hazard		204 201 205	See Hazard Procedure			
	GE2_W	Any excessive crossfall.	N/A	5 - Preventative	1		1	N/A	N/A	N/A	N/A	As a part of programmed Works*		203 202 208				
<b>33</b>	<b>GF</b>	<b>Loss of Pavement Running Course</b>																
	GF1_W	Any loss of pavement running course.	N/A	5 - Preventative	1		1	N/A	N/A	N/A	N/A	As a part of programmed Works*		205				
<b>34</b>	<b>GG</b>	<b>Insufficient Formation Height Above Natural Surface</b>																
	GG1_H	Water ponds or possibility of creating water ponds on the roadway that cannot be drained off naturally.	N/A	1 - Hazard	10	10	20	As a hazard						205	See Hazard Procedure			
	GG2_P	Loss of formation shape.	N/A	2 - Ordered Work / Special	9	9	18	N/A	N/A	N/A	N/A	As advised by Principal						
<b>35</b>	<b>GH</b>	<b>Unsealed Roadway Defects, General (such as wind rows of material, scour channels, corrugations, soft, slippery areas, course surface texture, loose material, roughness)</b>																
	GH1_H	Any isolated defects identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	N/A	N/A	N/A	N/A	As a hazard		204 201 205	See Hazard Procedure			
	GH2_M	Any other unsealed road defects unsafe for road user.	N/A	3 - Safety	3		3	N/A	N/A	N/A	N/A	Log the defect monitor and inform to Principal		206 203 202 208 207 214				

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category		Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)		8	6	4	3	2							
					Corporate Priorities and Defect Scoring		Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)			Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT
<b>Defect Category 08 - Surface Drain Defects</b>																		
<b>36</b>	<b>GI</b>	<b>Surface Drain Defects</b>																
	GI1_H	Blocked surface drain cause flooding to the roadway is identified by inspection, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard						301 305 302	See Hazard Procedure			
	GI2_P	Blocked surface drain causing flooding to the private property.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal						303 304				
	GI3_M	Blocked surface drain increase shoulder / pavement deterioration.	N/A	5 - Preventative	1		1	Log the defect and monitor drainage performance						319				
	GI4_M	Scouring of drains.	N/A	5 - Preventative	1		1	Log the defect and monitor drainage performance						429				
<b>Defect Category 09 - Concrete Roadway, Culvert, Pipe, Pit &amp; Floodway Defects</b>																		
<b>37</b>	<b>HA</b>	<b>Drainage Obstructed</b>																
	HA1_H	Any drainage obstruction creating water ponding and not free draining (free draining means water disperses without action of traffic) on pavement edge or on shoulder that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard						301 305 302 303 304	See Hazard Procedure			
	HA2_P	Any drainage obstruction endangering private property.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal						319 341				
	HA3_I	Amount of waterway area obstructed exceeds 20%.	20%	5 - Preventative	1		1	30%	9	30%	7	50%	5	50%	4	50%	3	
<b>38</b>	<b>HB</b>	<b>Silt or Debris on Floodway Sections</b>																
	HB1_H	Any silt or debris encroaching into floodway sections of roadway identified by inspections, complaint that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard						340	See Hazard Procedure			
<b>39</b>	<b>HC</b>	<b>Culvert, Pipe, Pit and Floodway Defects, Other</b>																
	HC1_H	Damaged or missing drainage pit lids, surrounds, grates, in pedestrian areas or traffic lanes.	N/A	1 - Hazard	10	10	20	As a hazard						320 322 323	See Hazard Procedure			
	HC2_M	Cracking > 5 mm in culvert components or visible movement.	5 mm	3 - Safety	4		4	Log the defect monitor and inform to Principal						324 325				
	HC3_M	Misalignment / separation of culvert components > 20 mm, including head wall separation.	20 mm	3 - Safety	4		4	Log the defect monitor and inform to Principal						327 321				

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																				
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks						
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100								
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score												
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	HC4_M	Corrosion / loss of section of steel components, including reinforcement in concrete structures.	Visible corrosion	3 - Safety	4		4	Log the defect monitor and inform to Principal											328 329 341 342 349 319	
	HC5_M	Possibility of reduction of structural integrity due to spalling over the concrete surface.	N/A	3 - Safety	4		4	Log the defect monitor and inform to Principal												
	HC6_M	Cracking in end structures (less than 5 mm wide and no forward movement).	N/A	5 - Preventative	1		1	Log the defect monitor and inform to Principal												
	HC7_M	Misalignment / separation of culvert components < 20 mm, including head wall separation.	Visible separation	5 - Preventative	1		1	Log the defect monitor and inform to Principal												
	HC8_M	Culvert or end structure silted up.	N/A	5 - Preventative	1		1	Log the defect monitor and inform to Principal												
	HC9_M	Scouring around culvert components.	N/A	5 - Preventative	1		1	Log the defect monitor and inform to Principal												
<b>40</b>	<b>HD</b>	<b>Cracks in Concrete Roadway (diagonal, block, transverse, corner cracks, longitudinal, meandering and surface cracks)</b>																		
	HD1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is likely to become hazardous.	N/A	1 - Hazard	10	10	20	As a hazard											124 125	See Hazard Procedure
	HD2_I	Individual crack width exceeds 3 mm or there is excessive cracking and moisture is penetrating the pavement.	3 mm	5 - Preventative	1		1	5 mm	9	5 mm	7	10 mm	5	20 mm	4	20 mm	1			
<b>41</b>	<b>HE</b>	<b>Spalling of Joints - Concrete Pavement</b>																		
	HE1_H	Evidence of spalling of concrete occurring adjacent to slab joints that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard											124	See Hazard Procedure
	HE2_R	Plan dimension of spalling of joints exceeds 100 mm.	100 mm	5 - Preventative	1		1	4 weeks	9	6 weeks	7	6 weeks	5	3 months	4	6 months	3			
	HE3_P	Any spalling in wheel path attracts complaints due to unacceptable ride quality.	N/A	2 - Ordered Work/Special	9	9	18	As advised by Principal												
<b>42</b>	<b>HF</b>	<b>Joint Sealant Defects in Concrete Pavement</b>																		
	HF1_I	Percentage of missing sealant between concrete slabs exceeds 20%.	20%	5 - Preventative	1		1	30%	9	30%	7	40%	5	40%	4	50%	3	126		
<b>43</b>	<b>HG</b>	<b>Potholes in Concrete Pavement</b>																		
	HG1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard											127 129	See Hazard Procedure
	HG2_I	Plan dimension on sealed pavements exceeds 100 mm.	100 mm	3 - Safety	3		3	300 mm	11	400 mm	9	500 mm	7	500 mm	6	600 mm	5			

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																				
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks						
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100								
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score												
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	HG2_R	Plan dimension on sealed pavements exceeds the upper Intervention Level in JD2_I.	Upper IL	3 - Safety	5		5	24 hours	13	1 week	11	2 weeks	9	3 weeks	8	4 weeks	7			
	HG3_M	Plan dimension on sealed pavements is less than 100 mm.	100 mm	5 - Preventative	1		1	Log the defect and monitor if plan dimension exceeds 50 mm												
	HG4_I	Depth on sealed pavements exceeds 30 mm.	30 mm	3 - Safety	3		3	40 mm	11	40 mm	9	50 mm	7	60 mm	6	80 mm	5			
	HG4_R	Depth on sealed pavements exceeds the upper Intervention Level in JD4_I.	Upper IL	3 - Safety	5		5	24 hours	13	1 week	11	2 weeks	9	3 weeks	8	4 weeks	7			
	HG5_M	Depth on sealed pavements is less than 30 mm.	30 mm	5 - Preventative	1		1	Log the defect and monitor if depth exceeds 20 mm												
	HG6_P	Any pothole in the wearing surface that results in the loss of material under traffic.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal												
<b>44</b>	<b>HH</b>	<b>Sunken Concrete Pavement Slab (Stepping)</b>																		
	HH1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard											128	See Hazard Procedure
	HH2_I	Any abrupt difference in height to adjacent slab / surface exceeds 3 mm.	3 mm	3 - Safety	2		2	15 mm	10	20 mm	8	20 mm	6	20 mm	5	20 mm	4			
<b>Defect Category 10 - Subsoil Drain Defects</b>																				
<b>45</b>	<b>IA</b>	<b>Subsoil Drain Defects</b>																		
	IA1_M	Any non-functional or missing or decayed element of the subsoil drainage system, including flush points and outlets reducing flow capacity or sub soil drainage integrity.	N/A	5 - Preventative	1		1	Log the defect monitor and inform to Principal											330 331 332 339 329	
<b>Defect Category 11 - Roadside Vegetation Defects</b>																				
<b>46</b>	<b>JA</b>	<b>Grass not in sight line</b>																		
	JA1_P	Excessive roadside vegetation in rural area to control fire hazard or drainage, applies to designated areas only.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal											401 408 402 403 415	Discuss with Element Leader
<b>47</b>	<b>JB</b>	<b>Large Trees and Shrubs Close to Roadway (Tree removal must be in consultation with Transport and Main Roads District Environmental Management Team)</b>																		
	JB1_H	Large trees close to roadway which are considered to be a hazard.	N/A	1 - Hazard	10	10	20	As a hazard											405	See Hazard Procedure

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																				
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks						
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100								
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score												
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	JB2_P	At medians: Trees and shrubs with a trunk diameter exceeds 50 mm measured 300 mm above ground level within clear zone.	50 mm	2 - Ordered Work / Special	9	9	18	As advised by Principal											419	
	JB3_P	Other: Previously cleared area where regrowth is evident.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal												
<b>48</b>	<b>JC</b>	<b>Declared Plants</b>																		
	JC1_P	Remove noxious weeds and environmental weeds before they flower.	N/A	4 - Legislative	1		1	As advised by Principal											407 406 460 405	Discuss with Element Leader
<b>49</b>	<b>JD</b>	<b>Trees or Limbs Likely to Fall on Roadway</b>																		
	JD1_H	Trees, overhanging branches or broken limbs most likely to fall on roadway to be a hazard.	N/A	1 - Hazard	10	10	20	As a hazard											405	See Hazard Procedure
	JD2_R	Limbs exceeds 100 mm in diameter with > 50% of foliage die back or evidence of dead or rotting or damaged timber hanging over any portion of the carriageway lane width.	100 mm	3 - Safety	4		4	2 weeks	12	1 month	10	1 month	8	2 months	7	3 months	6			
<b>50</b>	<b>JE</b>	<b>Grass, Trees and Shrubs in Sight Line, in Drain or Obstructing Roadside Furniture</b>																		
	JE1_H	Vegetation obscures sight distance, minimum stopping distance that is a hazard.	N/A	1 - Hazard	10	10	20	As a hazard											401 407 405 408 403 319 404	See Hazard Procedure
	JE2_R	Vegetation obscures sight distance and minimum stopping sight distance.	N/A	3 - Safety	4		4	2 weeks	12	1 month	10	1 month	8	2 months	7	3 months	6			
	JE3_R	Vegetation obscures sight lines of accesses or intersections or sight distances of previously cleared areas or any signs or guide posts.	N/A	3 - Safety	4		4	2 weeks	12	1 month	10	1 month	8	2 months	7	3 months	6			
	JE4_R	Any vegetation within 3.6 m of edge of roadway exceeds 500 mm on national highways and 700 mm on state roads.	500 mm or 700 mm	3 - Safety	4		4	1 month	12	2 months	10	3 months	8	6 months	7	6 months	6			



Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100							
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)
<b>51</b>	<b>JF</b>	<b>Landscaping Defects</b>																	
	JF1_M	Loss of asset.	5%	6 - Appearance / Usability	1		1						409 411 412 419 410 401 403	Log the defect monitor and inform to Principal					
<b>52</b>	<b>JG</b>	<b>Grass Growth on Medians</b>																	
	JG1_I	Grass in urban areas.	N/A	6 - Appearance / Usability	1		1	200 mm	9	200 mm	7	200 mm	5	200 mm	4	200 mm	3		
	JG1_R	Urban areas growth exceeds 200 mm in height.	200 mm	6 - Appearance / Usability	1		1	1 month	9	1 month	7	1 month	5	2 months	4	2 months	3	407 408 404	
	JG2_I	Grass in rural areas.	N/A	6 - Appearance / Usability	1		1	500 mm	9	500 mm	7	500 mm	5	500 mm	4	500 mm	3	402 403	
	JG2_U	Rural areas growth exceeds 500 mm in height.	500 mm	6 - Appearance / Usability	1		1	1 month	9	2 months	7	2 months	5	3 months	4	3 months	3		
<b>Defect Category 12 - Rest Area Defects</b>																			
<b>53</b>	<b>KA</b>	<b>Dead Trees or Limbs in Rest Area</b>																	
	KA1_H	Trees, overhanging branches or broken limbs most likely to fall on rest areas.	N/A	1 - Hazard	10	10	20											405 440	See Hazard Procedure
<b>54</b>	<b>KB</b>	<b>Routine Amenity Servicing</b>																	
	KB1_R	Any verified defect identified by inspection, complaint, or notification by Principal that renders the facility unusable.	N/A	2 - Ordered Work / Special	3		3	24 hours	11	24 hours	9	Twice weekly	7	Weekly	6	Twice monthly	5	440	
	KB2_P	Routine amenity services.	N/A	2 - Ordered Work / Special	9	9	18												As advised by Principal
<b>55</b>	<b>KC</b>	<b>Litter, Below Standard Amenity Furniture in Rest Area</b>																	
	KC1_R	Litter bins collection.	N/A	2 - Ordered Work / Special	2		2	24 hours	10	24 hours	8	Weekly	6	Weekly	5	Twice monthly	4	440	

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																								
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A vpd > 30000		Cat B vpd 10000-30000		Cat C vpd 500-10000		Cat D vpd 100-500		Cat E vpd < 100		Maintenance Activity Number	Remarks					
					Location Score (C)			8		6		4		3		2								
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score																
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)			Upper IL or RT	Corp Score (A+B+C)			
<b>56</b>	<b>KD</b>	<b>Rest Area Defects Other</b>																						
	KD1_P	Rest area building maintenance (painting, plumbing, roofing etc).	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal										440 441 449 405						
	KD2_R	Height of vegetation exceeds 200 mm.	N/A	3 - Safety	1		1	1 month	9	1 month	7	1 month	5	1 month	4	6 weeks	3							
	KD3_R	Any pavement related defects.	N/A	3 - Safety	1		1	1 month	9	2 months	7	3 months	5	4 months	4	4 months	3							
<b>Defect Category 13 - Other Roadside Defects</b>																								
<b>57</b>	<b>LA</b>	<b>Unauthorised Signs</b>																						
	LA1_P	Any verified unauthorised sign identified by inspection, complaint or notification by Principal.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal										424	See Hazard Procedure					
<b>58</b>	<b>LB</b>	<b>Unstable Batter / Embankment, Missing Material</b>																						
	LB1_P	Unstable cut / embankment to be filled to manage scour, cracks, erosion or instability.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal										426 427 339 875						
<b>59</b>	<b>LC</b>	<b>Damaged Concrete or Paving Blocks</b>																						
	LC1_H	Damaged, displaced concrete or paving blocks in pedestrian areas, identified by complaint, inspection or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										306 429	See Hazard Procedure					
	LC2_R	Damaged, displaced concrete or paving blocks in pedestrian areas potentially causing unsafe situation to pedestrian.	N/A	3 - Safety	4		4	1 week	12	1 week	10	2 weeks	8	2 weeks	7	2 weeks	6							
	LC3_R	Damaged, displaced concrete or paving blocks potentially causing unsafe situation to travelling public.	N/A	3 - Safety	2		2	2 weeks	10	2 weeks	8	4 weeks	6	4 weeks	5	6 weeks	4							
<b>60</b>	<b>LD</b>	<b>Loose Earth, Rock in Sight Line</b>																						
	LD1_R	Earth, rock and loose material in sight line.	N/A	3 - Safety	4		0	1 week	8	1 week	6	2 weeks	4	2 weeks	3	2 weeks	2	425 429						

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100							
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	
<b>61</b>	<b>LE</b>	<b>Litter on Road Reserve</b>																	
	LE1_H	Any verified litter (dumped tyres, oil waste etc) on road reserve identified by inspection, complaint, or notification by the Principal that is deemed a health hazard.	N/A	1 - Hazard	10	10	20	As a hazard					420	See Hazard Procedure					
	LE2_P	Offensive litter on road reserve.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal					421						
	LE3_M	Litter on environmentally sensitive locations.	N/A	4 - Legislative	1		1	Log the defect monitor and inform to Principal					429						
												440							
<b>62</b>	<b>LF</b>	<b>Graffiti</b>																	
	LF1_R	Any graffiti considered offensive or compromised road user safety. Remove within specified time frame.	N/A	3 - Safety	4			24 hrs					422						
	LF2_R	Any other graffiti that is highly visible. Remove within specified time frame.	N/A	5 - Preventative	3			48 hrs											
	LF3_R	Any graffiti that does not belong to LF1_R, LF2_R, or LF4_P. Remove within specified time frame.	N/A	6 – Appearance / Usability	2			4 weeks											
	LF4_P	Any graffiti ordered to remove by Principal.		2 - Ordered Work / Special	9	9	18	As advised by Principal											
<b>63</b>	<b>LG</b>	<b>Scoured Areas on the Road Reserve</b>																	
	LG1_H	Scour is likely to affect the structural capacity of the roadway.	N/A	1 - Hazard	10	10	20	As a hazard					880	See Hazard Procedure					
	LG2_P	Any scour is likely to cause environmental damage or likely to affect adjoining private property.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal					429						
												310							
												311							
<b>64</b>	<b>LH</b>	<b>Abandoned Vehicles</b>																	
	LH1_H	Any abandoned vehicle or equipment likely to be hazardous to travelling public or pedestrians.	N/A	1 - Hazard	10	10	20	As a hazard					429	See Hazard Procedure					
	LH2_P	Any other abandoned vehicle or equipment in road reserve.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal					418						
<b>65</b>	<b>LI</b>	<b>Illegal Accesses</b>																	
	LI1_P	Any illegal accesses to Road Network.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal					429						

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
<b>66</b>	<b>LJ</b>	<b>Illegal Turning Areas</b>																
	LJ1_P	Any illegal turning areas within Road Network.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal					429 439					
<b>67</b>	<b>LK</b>	<b>Landscape Vegetation Defects</b>																
	LK1_M	Landscape vegetation in any visually sensitive locations is likely to compromise road user safety.	N/A	3 - Safety	1		1	Log the defect monitor and inform to Principal					429					
	LK2_M	Landscape vegetation in any visually sensitive locations.	N/A	6 - Appearance / Usability	1		1	Log the defect monitor and inform to Principal										
<b>68</b>	<b>LL</b>	<b>Damaged Transport and Main Roads Fencing</b>																
	LL1_H	Fence damage that is a hazard.	N/A	1 - Hazard	10	10	20	As a hazard						See Hazard Procedure				
	LL2_M	Damage affecting effectiveness or purpose of the fence.	N/A	3 - Safety	3		3	Log the defect monitor and inform to Principal					880 429					
	LL3_M	Poor aesthetics to travelling public or pedestrians.	N/A	6 - Appearance / Usability	1		1	Log the defect monitor and inform to Principal										
<b>69</b>	<b>LM</b>	<b>Damaged Transport and Main Roads Noise Barrier Fencing</b>																
	LM1_P	One panel is missing or damaged.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal					870					
<b>70</b>	<b>LN</b>	<b>Damaged or Unserviceable Bus Shelters</b>																
	LN1_M	Damaged or unserviceable bus shelters likely to compromise public safety.	N/A	3 - Safety	1		1	Log the defect monitor and inform to Principal					890 891					
<b>71</b>	<b>LO</b>	<b>Sediment Pond Defects General</b>																
	LO1_P	Silted or unserviceable sedimentation pond facilities.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal					312 313					
	LO2_M	Any defect likely to affect the proper functioning of the asset.	N/A	5 - Preventative	1		1	Log the defect monitor and inform to Principal										
<b>72</b>	<b>LP</b>	<b>Damaged Roadside Weighing Area</b>																
	LP1_P	Facility is not functional.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal					429					

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category		Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks						
					Location Score (C)		vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100								
					Corporate Priorities and Defect Scoring		Upper Intervention Level: Maximum Response Time: Defect Final Score												
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)			Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)
<b>Defect Category 14 - Traffic Sign Defects</b>																			
<b>73</b>	<b>MA</b>	<b>Missing, Damaged or Dirty Regulatory, Warning or Hazard Sign</b>																	
	MA1_H	Any sign or footing damage, including sign being unstable, that is a hazard.	N/A	1 - Hazard	10	10	20	As a hazard										501	See Hazard Procedure
	MA2_R	Regulatory signs (R1, R2, R3 and R4 series) missing, damaged or dirty sign face (after cleaning, sign is not clearly legible from 150 m at night with lights on low beam in rural areas or legible within 2.5 seconds of travel at the operational speed in urban areas).	N/A	3 - Safety	5		5	1 day	13	1 day	11	1 day	9	1 day	8	1 day	7	502	
	MA3_R	Regulatory signs (R5 Series, e.g. parking limits) missing, damaged or dirty face (after cleaning, sign is not clearly legible from 150 m at night with lights on low beam in rural areas or legible within 2.5 seconds of travel at the operational speed in urban areas).	N/A	3 - Safety	3		3	2 months	11	3 months	9	3 months	7	3 months	6	3 months	5	503	
	MA4_R	Any hazard or warning sign missing, damaged or dirty sign face (after cleaning, sign is not clearly legible from 150 m at night with lights on low beam in rural areas or legible within 2.5 seconds of travel at the operational speed in urban areas).	N/A	3 - Safety	4		4	2 months	12	3 months	10	3 months	8	3 months	7	3 months	6	504	
																		508	
																		509	
<b>74</b>	<b>MB</b>	<b>Missing or Defective Guide Sign</b>																	
	MB1_H	Any verified defect on sign or support identified by inspection, complaint, or notification by the Principal that is likely to become hazardous to public.	N/A	1 - Hazard	10	10	20	As a hazard										504	See Hazard Procedure
	MB2_R	Any guide sign missing, damaged or dirty sign face (after cleaning, sign is not clearly legible from 150 m at night with lights on low beam in rural areas or legible within 2.5 seconds of travel at the operational speed in urban areas) is likely to create unsafe road environment to travelling public.	N/A	3 - Safety	2		2	1 week	10	1 week	8	2 weeks	6	3 weeks	5	4 weeks	4	506	
																		505	
																		507	
																		512	



Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category		Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks						
					Location Score (C)		vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100								
					Corporate Priorities and Defect Scoring		Upper Intervention Level: Maximum Response Time: Defect Final Score												
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)			Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)
<b>75</b>	<b>MC</b>	<b>Sign Misalignment</b>																	
	MC1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										509 501	See Hazard Procedure
	MC2_R	Sign is reflecting glare from vehicles lights at night back to the motorist.	N/A	3 - Safety	2		2	2 months	10	3 months	8	3 months	6	3 months	5	3 months	4	502 503	
	MC3_R	Sign is on a noticeable lean (greater than 15°).	15°	3 - Safety	1		1	2 months	9	3 months	7	3 months	5	3 months	4	3 months	3	506 508	
	MC4_R	Fix sign inclined to line of sight (twisted) (by more than 30°).	30°	3 - Safety	2		2	2 months	10	3 months	8	3 months	6	3 months	5	3 months	4	559	
<b>Defect Category 15 - Traffic Furniture Defects</b>																			
<b>76</b>	<b>NA</b>	<b>Guide Post or Delineator Defects</b>																	
	NA1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard										525 510 511 512 513 514 515 519 509	See Hazard Procedure
	NA2_R	Any missing guide posts in a hazardous location for the travelling public, or the post is on a noticeable lean, or there is an inability at night to see at least 2 delineators ahead (both red, both white, or red and white) from a guide post location, or any missing delineators on guardrail installation. (Above relates to observation after cleaning the post and delineator, on low beam).	N/A	3 - Safety	3		3	1 month	11	1 month	9	1 month	7	1 month	6	1 month	5		

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT
<b>77</b>	<b>NB</b>	<b>Guardrail, Fencing and Concrete Barrier Structural Defects</b>																
	NB1_H	Damaged guardrail or components (e.g. terminal sections) are a potential hazard to traffic.	N/A	1 - Hazard	10	10	20	As a hazard									522 523 524 530 532 534 520 531 559 429 525	See Hazard Procedure
	NB2_R	Guardrail, fencing or concrete barrier facility has a loss of structural integrity.	N/A	3 - Safety	5		5	1 week	13	2 weeks	11	3 weeks	9	2 months	8	3 months	7	
	NB3_R	Guardrail panel is bent exceeding 200 mm out of alignment.	200 mm	5 - Preventative	2		2	1 month	10	2 months	8	3 months	6	6 months	5	6 months	4	
	NB4_P	Aesthetic appearance decreased by accumulation of dirt, peeling paint etc.	N/A	2 - Ordered Work / Special	9	9	18	As advised by Principal										
<b>78</b>	<b>NC</b>	<b>Reference Marker Defects</b>																
	NC1_R	Reference Marker not visible or missing.	N/A	6 - Appearance / Usability	1		1	3 months	9	3 months	7	4 months	5	6 months	4	6 months	3	512
	NC2_R	Illegible when viewed from vehicle travelling at 80 km/hr.	N/A	6 - Appearance / Usability	1		1	3 months	9	3 months	7	4 months	5	6 months	4	6 months	3	
<b>79</b>	<b>ND</b>	<b>Kerb or Dyke Defect</b>																
	ND1_H	Any verified defect identified by inspection, complaint, or notification by the Principal that likely to cause accidents.	N/A	1 - Hazard	10	10	20	As a hazard									306 429	See Hazard Procedure
	ND2_I	Damaged, misaligned kerbing or median noses $\geq$ 20 mm, interrupted longitudinal drainage flow, tripping hazards.	20 mm	3 - Safety	2		2	50 mm	10	50 mm	8	50 mm	6	50 mm	5	N/A	0	
	ND2_R	Damaged, misaligned kerbing or median noses exceeds the upper Intervention Level in PD2_I that interrupted longitudinal drainage flow, tripping hazards.	Upper IL	3 - Safety	3		3	1 week	11	1 week	9	2 weeks	7	4 weeks	6	N/A	0	
	ND3_M	Continuous kerbing damaged or missing.	N/A	6 - Appearance / Usability	2		2	Log the defect monitor and inform to Principal										

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
<b>80</b>	<b>NE</b>	<b>Guardrail, Fencing and Concrete Barrier Appearance Defects</b>																
	NE1_H	Poor visibility of guardrail, fencing, concrete barriers and its components due to dirt, peeling of paint or due to vegetation is verified by complaint, inspection or notification by the Principal that is likely to cause accidents.	N/A	1 - Hazard	10	10	20	As a hazard					521 522 559	See Hazard Procedure				
<b>Defect Category 16 - Traffic Marking Defects</b>																		
<b>81</b>	<b>OA</b>	<b>Missing or Faded Painted Road Lines and Markings</b>																
	OA1_M	Any verified defect identified by inspections, complaint or notification by the Principal that is unsafe.	N/A	3 - Safety	4		4	Log the defect monitor and inform to Principal					701, 702 703, 704 705 709 707 710 711 712 713 714 719 720 721 722 723 724 725 729 730 731 735 736 745 750 759 429 559 760 770					

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
<b>82</b>	<b>OB</b>	<b>Raised Pavement Marker Defects</b>																
	OB1_M	Loss of, or loss of reflectivity (%) of markers on straights exceeds 25% on curves and exceeds 50% on straights in 100 m or any consecutive markers are missing.	25% on curve or 50% on straights	3 - Safety	4		4	Log the defect monitor and inform to Principal						740 429 559				
<b>Defect Category 17 - Traffic Signal Defects</b>																		
<b>83</b>	<b>PA</b>	<b>Traffic Signal Controller Defects</b>																
	PA1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: <ul style="list-style-type: none"> <li>Flashing yellow</li> <li>Site blacked out</li> <li>Confusing signal displays</li> <li>Controller knocked down</li> <li>Stuck in phase / not cycling</li> <li>Safety critical times too short</li> <li>Skipping phase, not serving vehicle or pedestrian demands</li> <li>Train (heavy rail) interface not operating correctly</li> <li>Tram (light rail) interface not operating correctly, and/or</li> <li>2 lamps out or more per signal group failure.</li> </ul>	N/A	1 - Hazard				4 hours						650	See Hazard Procedure			
	PA2_P	Any reported defects where the installation is safe but is operationally degraded, including but not limited to ground mounted and overhead mounted traffic signals: <ul style="list-style-type: none"> <li>Twisted and non-conflicting lantern arrangement</li> <li>Lamps out (other than pedestrian "Don't Walk" lamps)</li> <li>Visors or louvres missing or damaged</li> <li>Lenses damaged, and/or</li> <li>Missing / defaced labelling.</li> </ul>	N/A	2 - Ordered Work / Special				2 business days						650 602 618 619 950				

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																				
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks						
								vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100								
								8	6	4	3	2								
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score												
							Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)		
	PA3_R	<ul style="list-style-type: none"> <li>Detector failures causing phases to be called and/or extended unnecessarily</li> <li>Communications failure</li> <li>Timing fault (not safety critical times), and/or</li> <li>Button failures causing phases to be called and/or extended unnecessarily.</li> </ul>	N/A	3 - Safety									650 618 619							
<b>84</b>	<b>PB</b>	<b>Traffic Signal Lantern Defects</b>																		
	PB1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: <ul style="list-style-type: none"> <li>Flashing yellow</li> <li>Confusing signal displays</li> <li>Misaligned lantern causing confusing signal displays</li> <li>Damaged or open door on lantern, and/or</li> <li>Damaged lantern or lantern parts at risk of falling.</li> </ul>	N/A	1 - Hazard															650	See Hazard Procedure
	PB2_P	<ul style="list-style-type: none"> <li>Twisted and non-confusing lantern arrangement</li> <li>Missing or damaged hardware (i.e. missing pole and/or associated hardware)</li> <li>Lamp outages</li> <li>Visors, louvres or target boards missing or damaged</li> <li>Poor lantern aiming, and/or</li> <li>Loss of displays.</li> </ul>	N/A	2 - Ordered Work / Special															650 602 618 619 950	

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
<b>85</b>	<b>PC</b>	<b>Traffic Signal Electrical Defects</b>																
	PC1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: <ul style="list-style-type: none"> <li>Flashing yellow</li> <li>Damaged or missing finial cap / traffic signal mast arm junction box / JU pole terminal panel cover / controller cabinet door</li> <li>Hanging or damaged cables</li> <li>Exposed wires / cables, and/or</li> <li>Audio tactile unit fault.</li> </ul>	N/A	1 - Hazard						4 hours		650	See Hazard Procedure					
<b>86</b>	<b>PD</b>	<b>Traffic Signal Hardware Defects</b>																
	PD1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: <ul style="list-style-type: none"> <li>Confusing signal displays</li> <li>Damaged and dangerous post / pole, including knockdowns</li> <li>Controller knocked down</li> <li>Damaged push button</li> <li>Push button not operating and not placing a demand</li> <li>Stuck in phase / not cycling</li> <li>Skipping phase, not servicing vehicle or pedestrian demands</li> <li>Trivision sign fault causing confusion, and/or</li> <li>Audio tactile unit fault.</li> </ul>	N/A	1 - Hazard						4 hours		650	See Hazard Procedure					



Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			8	6	4	3	2						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	PD2_P	<ul style="list-style-type: none"> <li>Misaligned and non-confusing lantern arrangement</li> <li>Missing or damaged hardware (i.e. missing pole and/or associated hardware)</li> <li>Lamp outages</li> <li>Visors, louvres or target boards missing or damaged</li> <li>Poor lantern aiming</li> <li>Loss of displays</li> <li>Failed inductive loops, and/or</li> <li>Finish, controller obviously out of plumb, pole obviously out of plumb, signal hardware out of plumb, tidiness, cleanliness etc.</li> </ul>	N/A	2 - Ordered Work / Specials				Missing pole and associated hardware (without footing damage) – 12 business days Missing pole and associated hardware (with footing damage) – 16 business days Otherwise, monthly (Traffic Signal Lamp Failure Program)						650 618 619 602 610 950				
	PD3_R	<ul style="list-style-type: none"> <li>Detector failures causing phases to be called and/or extended unnecessarily</li> <li>Communications failure</li> <li>Timing fault (not safety critical times), and/or</li> <li>Button failures causing phases to be called and/or extended unnecessarily.</li> </ul>	N/A	3 - Safety				2 business days						650 618 619				
	PD6_P	Any reported defect not impinging the operation of the traffic equipment.	N/A	6 - Appearance / Usability				Monthly (Traffic Signal Lamp Failure Program)						602 610				
<b>87</b>	<b>PE</b>	<b>Traffic Signal Defects Other</b>																
	PE1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: <ul style="list-style-type: none"> <li>Vehicle detector on operating and placing a demand</li> <li>Heavy rail detector locked on or not operating</li> <li>Queue det equipment on ramp metering (on ramps and off ramps), and/or</li> <li>UPS failure.</li> </ul>	N/A	1 - Hazard				4 hours						650	See Hazard Procedure			

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)			8	6	4	3	2							
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)		
	PE2_P	<ul style="list-style-type: none"> <li>Misaligned and non-confusing lantern arrangement</li> <li>Missing or damaged hardware (i.e. missing pole and/or associated hardware).</li> <li>Lamp outages</li> <li>Loss of displays</li> <li>Failed inductive loops, and/or</li> <li>Finish, controller obviously out of plumb, pole obviously out of plumb, signal hardware out of plumb, tidiness, cleanliness etc.</li> </ul>	N/A	2 - Ordered Work / Specials				Missing pole and associated hardware (without footing damage) – 12 business days Missing pole and associated hardware (with footing damage) – 16 business days Otherwise, monthly (Traffic Signal Lamp Failure Program)						650 602 618 619 610 950					
	PE3_R	<ul style="list-style-type: none"> <li>Detector failures causing phases to be called and/or extended unnecessarily</li> <li>Communications failure</li> <li>Timing fault (not safety critical times), and/or</li> <li>Button failures causing phases to be called and/or extended unnecessarily.</li> </ul>	N/A	3 - Safety				2 business days						650 618 619					
<b>88</b>	<b>PF</b>	<b>Electrical Cable Pit Defects</b>																	
	PF1_P	Electrical cable pit is not safe for public.	N/A	2 - Ordered Work / Specials				Readily accessible by public pedestrians – 4 hours Not readily accessible by public pedestrians (i.e. motorway, rural road environment) – 5 business days						650 635 640					
	PF2_R	Electrical cable pit has been made safe but is operationally degraded. Any reported missing / damaged electrical cable pit lid located in areas of the road reserve that are not readily accessible by pedestrian traffic (i.e. motorway, rural road environment) ("make safe work").	N/A	3 - Safety				18 business days						635 640					
<b>89</b>	<b>PG</b>	<b>Inductive Loop Defects (not at a traffic signal installation)</b>																	
	PG1_H	Any reported defects where the equipment that is likely to cause personal injury / property damage.	N/A	1 - Hazard				5 business days		5 business days		2 business days		2 business days		2 business days		621	See Hazard Procedure
	PG2_P	Any reported inductive loop failures.	N/A	2 - Ordered Work / Specials				Road lighting sites requiring access via low level traffic – 10 business days Road lighting sites requiring access via high level traffic – 15 business days						621					
<b>90</b>	<b>PH</b>	<b>Emergency Phone Defects</b>																	
	PH1_P	Emergency phone Site is / has been made safe but is operationally degraded, including	N/A	2 - Ordered Work / Specials				8 business days						550					

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			8	6	4	3	2						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
		but not limited to: <ul style="list-style-type: none"> <li>Handset off holder, and/or</li> <li>Missing, damaged or faulty hardware.</li> </ul>																
Defect Category 18 - Public Lighting Defects																		
91	QA	Lighting Switchboard Defects																
	QA1_H	Complete failure of switchboard resulting in electrical shock risk to people.	N/A	1 - Hazard							4 hours		651	See Hazard Procedure				
	QA2_H	Switchboard door open or Pillar cover dislodged, visible and easily accessible to public.	N/A	1 - Hazard							4 hours		651	See Hazard Procedure				
	QA3_R	Any reported lighting circuit, electrical switchboard or consumer mains failure presenting unlikely electrical shock risk to people.	N/A	3 - Safety							Road lighting sites requiring access via low level traffic – 5 business days Road lighting sites requiring access via high level traffic – 15 business days		609					
	QA4_R	Switchboard door / pillar cover insecure / not locked, potentially accessible to public.	N/A	3 - Safety							4 hours		651					
92	QB	Lighting Hardware Defects																
	QB1_H	Damaged or missing electrical cable pit lid located in areas of the road reserve that are accessible by pedestrians.	N/A	1 - Hazard							4 hours		651 635 640	See Hazard Procedure				
	QB2_H	Lighting pole knocked down and in path of traffic, or pole falling imminent, e.g. hit by mower / vehicle causing partial slip of slip base pole. Visibly loose nuts at the base of the pole. Signs of imminent danger, e.g. significant swaying, leaning, soil erosion at footing, pole creaking, pole dented > 20% pole diameter. Significant corrosion of pole. Outreach bracket hanging.	N/A	1 - Hazard							4 hours		651	See Hazard Procedure				
	QB3_H	Luminaire visor / diffuser not secure / hanging, or light is displaced / realigned and as a result is causing disability glare to traffic, e.g. pedestrian floodlight that was overslung is now underslung on outreach and now directs light onto approaching traffic and away from pedestrian crossing.	N/A	1 - Hazard							4 hours		651	See Hazard Procedure				

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	QB4_R	Lighting pole knocked down and NOT in path of carriageway. Route lighting scheme is operationally degraded < 95% service, due to missing, damaged or failed hardware.	N/A	3 - Safety				Missing pole and associated hardware (without footing damage) – 10 business days Missing pole and associated hardware (with footing damage) – 15 business days						950	Failure of isolated lighting installations fall under this Defect Code.			
	QB5_R	Road lighting circuit continuously on.	N/A	5 - Preventative				5 business days						608 611 612				
	QB6_R	Light cycling (intermittent switching on and off).	N/A	5 - Preventative				As per public lighting lamp run schedule						603 604 611 612				
	QB7_R	Damaged or missing electrical cable pit lid located in areas of the road reserve that are not accessible by pedestrian traffic. Includes flooded cable pits.	N/A	5 - Preventative				5 business days						650 635 640				
	QB8_R	Lighting pole identified with cut/tear or dent < 20% of pole diameter. Pole damaged but NO visible imminent danger, e.g. pole leaning, significant swaying, pole creaking. Loss of galvanisation and/or surface rust.	N/A	5 - Preventative				As advised by Principal						609				
<b>93</b>	<b>QC</b>	<b>Lighting Electrical Defects</b>																
	QC1_H	Pole or pole hatchway missing, exposing potentially live cables.	N/A	1 - Hazard				4 hours						651	See Hazard Procedure			
	QC2_H	Exposed cables in pit.	N/A	1 - Hazard				4 hours						651	See Hazard Procedure			
	QC3_R	Road lighting circuit failure (repairs to circuit in field). No electrical shock risk to people.	N/A	3 - Safety				Road lighting sites requiring access via low level traffic – 5 business days Road lighting sites requiring access via high level traffic – 15 business days						609				
<b>94</b>	<b>QD</b>	<b>Lighting General Defects</b>																
	QD1_H	Failed navigation lights connected to a public lighting switchboard.	N/A	1 - Hazard				As advised by Principal						603 604 608 609 611 612	See Hazard Procedure			
	QD2_R	Miscellaneous, e.g. vermin infestation.	N/A	2 - Ordered Work / Specials				As advised by Principal						609				

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																		
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks				
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100						
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score										
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
	QD3_R	Vegetation shading road lighting.	N/A	2 - Ordered Work / Specials				As advised by Principal									609	
	QD4_R	Individual road lighting defect regarding luminaire or mounting, e.g. outreach not correctly aligned / perpendicular, luminaire not horizontal or a single lamp failure (excluding flag or stand-alone emergency stopping bay lighting).	N/A	3 - Safety				As per public lighting lamp run schedule									603 604 611 612	
	QD5_R	Any reported graffiti, vandalism, unauthorised banners.	N/A	6 - Appearance / Usability				As advised by Principal									609 422	
Defect Category 19 - Bridge & Miscellaneous Structure Defects																		
95	RA	Bridge Defects General- Debris on Bridges																
	RA1_H	Any debris on overpass that can be used as projectiles that can be hazardous to travelling public or pedestrians.	N/A	1 - Hazard	10	10	20	As a hazard									455	See Hazard Procedure
	RA2_R	Debris on bridges that is likely to interrupt the drainage facility, operation of expansion joints or affect the usability of the bridge.	N/A	5 - Preventative	2		2	2 days	10	3 days	8	1 week	6	2 weeks	5	4 weeks	4	

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																			
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks					
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100							
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score											
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)
<b>Defect Category 20 - Emergency</b>																			
<b>96</b>	<b>SA</b>	<b>Emergency Call Out</b>																	
	SA1_H	Any reported emergency incidents that are likely to create an unsafe situation to road users or likely to damage the road asset.	N/A	1 - Hazard	10	10	20	Report on-site within 1 hour	20	Report on-site within 1 hour	20	Mobilise in 1 hour	20	Mobilise in 1 hour	20	Mobilise in 1 hour	20	452 860 450 889 455	See Hazard Procedure
<b>Defect Category 21 - Bike Path Defects</b>																			
<b>97</b>	<b>TA</b>	<b>Bike Path / Lanes Surface Defects</b>																	
	TA1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20	As a hazard									140 151 152 105 107 142 106 130 423 306 110 111 161 155 157 169 143 144 112 141	See Hazard Procedure	
	TA2_I	Accumulation of loose stones, sand or debris on the bike path exceeds 5 mm in depth or area exceeds 1 m <sup>2</sup>	5 mm	3 - Safety	4		4	10 mm	12	10 mm	10	10 mm	8	10 mm	7	10 mm	6		
	TA2_R	Accumulation of loose stones, sand or debris on the bike path exceeds the upper Intervention Level in VA2_I.	Upper IL	3 - Safety	5		5	3 days	13	3 days	11	3 days	9	3 days	8	3 days	7		



Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																							
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks									
					Location Score (C)			vpd > 30000	vpd 10000-30000	vpd 500-10000	vpd 100-500	vpd < 100											
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score															
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT			Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)				
	TA3_I	Accumulation of loose stones, sand or debris on the bike path exceeds 5 mm in depth or area exceeds 1 m <sup>2</sup> .	1 m <sup>2</sup>	3 - Safety	4		4	2 m <sup>2</sup>	4	2 m <sup>2</sup>	4	2 m <sup>2</sup>	4	2 m <sup>2</sup>	4	2 m <sup>2</sup>	4						
	TA3_R	Accumulation of loose stones, sand or debris on the bike path exceeds the upper Intervention Level in VA3_I.	Upper IL	3 - Safety	5		5	3 days	5	3 days	5	3 days	5	3 days	5	3 days	5						
	TA4_I	Potholes / delamination / isolated slab failure exceeds 10 mm in depth.	10 mm	3 - Safety	4		4	20 mm	12	20 mm	10	20 mm	8	20 mm	7	20 mm	6						
	TA4_R	Potholes / delamination / isolated slab failure exceeds the upper Intervention Level in VA4_I.	Upper IL	3 - Safety	5		5	3 days	13	3 days	11	3 days	9	3 days	8	3 days	7						
	TA5_I	Shoving, depressions, rutting, lumps or ridges exceeds 20 mm in 1.2 m straight edge.	20 mm	3 - Safety	4		4	30 mm	12	30 mm	10	30 mm	8	30 mm	7	30 mm	6						
	TA5_R	Shoving, depressions, rutting, lumps or ridges exceeds the upper Intervention Level in VA5_I.	Upper IL	3 - Safety	5		5	3 days	13	3 days	11	3 days	9	3 days	8	3 days	7						
	TA6_H	Objects or any other foreign material that creates a hazardous riding environment.	N/A	1 - Hazard	10	10	20	As a hazard											See Hazard Procedure				
	TA6_P	Objects or any other foreign material.	N/A	2 - Ordered Work / Specials	9	9		As advised by Principal															
	TA6_I	Objects or any other foreign material that creates unsafe riding environment.	N/A	3 - Safety	5		5	3 days	5	3 days	5	3 days	5	3 days	5	3 days	5						
<b>98</b>	<b>TB</b>	<b>Vegetation Defects - Bike Paths</b>																					
	TB1_H	Trees, overhanging branches or broken limbs most likely to fall on bike path to be a hazard.	N/A	1 - Hazard	10	10	20	As a hazard											405 419 404 402 401 407 405 408 403	See Hazard Procedure			
	TB2_P	Previously cleared area where regrowth is evident.	N/A	2 - Ordered Work / Specials	9	9	18	As advised by Principal															
	TB3_R	Unwanted trees and shrubs or grass obscures sightlines.	N/A	3 - Safety	2		2	2 weeks	10	2 weeks	8	2 weeks	6	2 weeks	5	2 weeks	4						
	TB4_M	Trees or limbs likely to fall on bike path.	N/A	3 - Safety	3		3	Log the defect and monitor if it becomes critical										3					

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																									
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category			Cat A vpd > 30000		Cat B vpd 10000-30000		Cat C vpd 500-10000		Cat D vpd 100-500		Cat E vpd < 100		Maintenance Activity Number	Remarks						
					Location Score (C)			8		6		4		3		2									
					Corporate Priorities and Defect Scoring			Upper Intervention Level: Maximum Response Time: Defect Final Score																	
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)			Upper IL or RT	Corp Score (A+B+C)				
<b>99</b>	<b>TC</b>	<b>Drainage defects - Bike paths</b>																							
	TC1_I	Obstructed drainage causing water ponding on bike path exceeds 1 m <sup>2</sup> or private property is endangered.	1 m <sup>2</sup>	3 - Safety	3		3	2 m <sup>2</sup>	11	2 m <sup>2</sup>	9	2 m <sup>2</sup>	7	2 m <sup>2</sup>	6	2 m <sup>2</sup>	5	301 305 302 303 304 319							
	TC1_R	Obstructed drainage cause water ponding on bike path exceeds the upper Intervention Level in VC1_I.	Upper IL	3 - Safety	3		3	2 days	11	2 days	9	2 days	7	2 days	6	2 days	5								
	TC2_R	Obstructed drainage cause water ponding adjacent to bike path.	N/A	5 - Preventative	1		1	2 weeks	9	2 weeks	7	2 weeks	5	2 weeks	4	2 weeks	3								
	TC3_I	Blocked drainage, culverts or pipes over 20% of the capacity.	20%	5 - Preventative	1		1	30%	9	30%	7	30%	5	30%	4	30%	3								
	TC3_R	Blocked drainage, culverts or pipes exceeds the upper Intervention Level in VC3_I.	Upper IL	5 - Preventative	1		1	2 weeks	9	2 weeks	7	2 weeks	5	2 weeks	4	2 weeks	3								
	TC4_R	Culverts, pipes and pits defects likely to impact on the integrity of the unit.	N/A	5 - Preventative	1		1	4 weeks	9	4 weeks	7	4 weeks	5	4 weeks	4	4 weeks	3								
<b>100</b>	<b>TD</b>	<b>Bike Path Defects General</b>																							
	TD1_R	Damaged bike path fencing creates unsafe riding environment to cyclists.	N/A	3 - Safety	1		1	2 days	9	2 days	7	2 days	5	2 days	4	2 days	3	880 501 504 502 506 505 509							
	TD2_R	Missing or defective regulatory or warning sign.	N/A	3 - Safety	1		1	2 days	9	2 days	7	2 days	5	2 days	4	2 days	3								
	TD3_R	Missing or defective guide sign.	N/A	6 - Appearance / Usability	1		1	2 weeks	9	2 weeks	7	2 weeks	5	2 weeks	4	2 weeks	3								

Defect Intervention Level and Response Time (IL/RT) criteria for Routine Maintenance																				
Defect No.	Defect Code / Subcode	Defect Intervention Level Criteria / Description	Initial Intervention Level	Corporate Priorities	Road Category		Cat A	Cat B	Cat C	Cat D	Cat E	Maintenance Activity Number	Remarks							
					Location Score (C)		8	6	4	3	2									
					Corporate Priorities and Defect Scoring		Upper Intervention Level: Maximum Response Time: Defect Final Score													
					Corp Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)			Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	Upper IL or RT	Corp Score (A+B+C)	
<b>Defect Category 22 - Pedestrian Safety</b>																				
<b>101</b>	<b>UA</b>	<b>Pedestrian Crossing / Path Surface Defects</b>																		
	UA1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous.	N/A	1 - Hazard	10	10	20												140 151 152 105 107 142 106 130 423 306 110 111 161 155 157 169 143 144 112 141	See Hazard Procedure
	UA2_P	Any verified defect identified by inspections, complaint or notification by the Principal that is a potential safety threat for pedestrians.	N/A	2 - Ordered Work / Specials	4		4	10 mm	12	10 mm	4	10 mm	4	10 mm	4	10 mm	4			
<b>Defect Category 23 - Common Defects</b>																				
<b>102</b>	<b>VA</b>	<b>Inspection Needed</b>																		
	VA1_P	Additional inspection needed by complaints, specific reason or incidents.	N/A	2 - Ordered Work	9	9	18												901 322	

Note 1: Priority Group Definition: 1 Hazard, 2 Ordered Work / Specials, 3 Safety, 4 Legislative, 5 Preventative, 6 Appearance / Usability.

Note 2: Road Cat A > = 30000 AADT, Road Cat B > = 10000 & < 30000 AADT, Road Cat C > = 500 & < 10000 AADT, Road Cat D > = 100 & < 500 AADT, Road Cat E < 100 AADT.

Note 3: \*Program of Works must be in place for unsealed roads.

Note 4: All criteria where intervention limit is given as "as advised by Principal" must be reported to Principal in 4 weeks.

Note 5: One month is equal to 30 days.

Note 6: Defect sub code acronym:

H - Hazard

P - Principal Ordered Works / Special

I - Defect within the Intervention Level

R - Defect breached upper Intervention Level

M - Defect in monitoring stage

W - Program of Works for unsealed roads.

Note 7: Corporate Priority weighting:

Priority 1 defects (Hazardous) - 20

Priority 2 defects (Ordered Works) - 18

Priority 3 to 6 defects – 5 to 1

Note 8: Field Weighting:

Asset rapid deterioration due to defect - 4

Asset moderate deterioration due to defect - 3

Asset low deterioration due to defect - 2

Defect is in the monitoring stage - 1

Note 9: Response Time starts when defect has reached its upper Intervention Level.

## 5 Chapter 5: Recommended Maintenance Activities

This chapter provides all recommended Maintenance Activities to rectify routine maintenance and some of other elements (rehabilitation, resurfacing etc) defects. Maintenance Activity payment types (Section 5.1) and Maintenance Activity Standards (Section 5.2) provide in-depth knowledge to use Maintenance Activities. Contractors may use alternative cost-effective Maintenance Activity Standards that suit better for local conditions. However, such Maintenance Activity Standards must fully comply with departmental technical requirements, and prior approval must be sought from Transport and Main Roads in order to use such Activities to deliver maintenance works.

### 5.1 Maintenance Activity payment types

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
<b>100</b>	<b>SEALED SURFACES</b>			
101	Edge Repair (Manual)	Normal	Unit Rate	tonnes
102	Edge Repair (Mechanical)	Normal	Unit Rate	tonnes
103	Edge Repair with Emulsion / Aggregate	Normal	Unit Rate	m <sup>3</sup> (loose)
105	Pothole Patching	Normal	Unit Rate	tonnes
106	Pothole Patching with Emulsion / Aggregate	Normal	Unit Rate	m <sup>3</sup>
107	Heavy Patching	Normal	Unit Rate	tonnes
108	Edge Repair (RAMC only)	Normal	Unit Rate	tonnes
110	Surface Correction with Premix / Asphalt (Manual) – Minor (< 150 m / km)	Normal	Unit Rate	tonnes
111	Surface Correction with Premix / Asphalt (Mechanical) – Minor (< 150 m / km)	Normal	Unit Rate	tonnes
112	Surface Correction with Emulsion / Aggregate – Minor (< 150 m / km)	Normal	Unit Rate	m <sup>3</sup>
113	Surface Correction – Major (> 150 m / km)	Normal	Unit Rate	m <sup>2</sup>
114	Surface Enrichment – Major (≥ 150 m / km)	Normal	Unit Rate	m <sup>2</sup>
115	Surface Enrichment – Minor (≤ 150 m / km)	Normal	Unit Rate	m <sup>2</sup>
117	Reseal – Major (≥ 150 m / km)	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
118	Seal Coating – Minor (< 150 m / km)	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
119	Surface Correction (Skid Resistance)	Normal	Unit Rate	m <sup>2</sup>
120	Fill Cracks	Normal	Unit Rate	Litres
121	Crack Treatment with Emulsion / Aggregate	Normal	Unit Rate	m <sup>3</sup>
122	Crack Treatment with Strain Alleviating Product	Normal	Unit Rate	m <sup>2</sup>

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
123	Surface Strip Treatment of Cracks	Normal	Unit Rate	Metres
124	Concrete Joint and Crack Treatment	Normal	Unit Rate	Metres
125	Stitch Treat Cracks in Concrete Roads	Normal	Unit Rate	Metres
126	Replacement of Concrete Joint Sealant	Prov. Sum	Fixed Price	Dollars
127	Concrete Pothole Patching	Normal	Unit Rate	m <sup>3</sup>
128	Jacking of Concrete Slab	Prov. Sum	Fixed Price	Dollars
129	Pavement Repairs, Concrete (Mechanical) – Minor ( $< 500 \text{ m}^2 / \text{km}$ )	Normal	Unit Rate	m <sup>2</sup>
130	Surface Sweeping	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
131	Surface Sweeping	Prov. Sum	Fixed Price	m <sup>2</sup>
135	Surface Debris Removal	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
137	Rut Correction – Minor ( $< 100 \text{ m} / \text{km}$ )	Normal	Unit Rate	tonnes
138	Rut Correction – Major ( $\geq 100 \text{ m} / \text{km}$ )	Normal	Unit Rate	tonnes
139	Other Bituminous Surface Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
140	Pavement Repairs (Manual)	Normal	Unit Rate	m <sup>2</sup>
141	Temporary Pavement Repairs (Mechanical)	Normal	Unit Rate	m <sup>2</sup>
142	Emergency Temporary Pavement Repairs	Normal	Unit Rate	tonnes
143	Pavement Repairs, Gravel (Mechanical) – Minor	Normal	Unit Rate	m <sup>2</sup>
144	Subgrade Treatment in Conjunction with Pavement Repair Activity	Normal	Unit Rate	m <sup>3</sup>
145	Scarify and Reshape Existing Pavement	Normal	Unit Rate	m <sup>2</sup>
146	Pavement Repairs, Asphalt (Mechanical) – Minor ( $< 500 \text{ m}^2$ )	Normal	Unit Rate	m <sup>2</sup>
147	Pavement Repairs, Gravel (Mechanical) – (Major $\geq 500 \text{ m}^2$ )	Normal	Unit Rate	m <sup>2</sup>
148	Pavement Repairs, Asphalt Gravel (Mechanical) – Major ( $\geq 500 \text{ m}^2 / \text{km}$ )	Normal	Unit Rate	m <sup>2</sup>
151	Gravel Supply – Insitu Stabilisation	Normal	Unit Rate	m <sup>3</sup> (loose)
152	Gravel Cartage – Insitu Stabilisation	Normal	Unit Rate	m <sup>3</sup> (loose) / km
153	Insitu Stabilisation – Minor ( $< 500 \text{ m}^2$ )	Normal	Unit Rate	m <sup>3</sup>
154	Insitu Stabilisation – Major ( $\geq 500 \text{ m}^2$ )	Normal	Unit Rate	m <sup>3</sup>
155	Asphalt Overlay – Major ( $\geq 150 \text{ m}$ )	Normal	Unit Rate	tonnes
157	Excavate and Replace Asphalt Wearing Surface ( $< 75 \text{ mm}$ , for areas $< 150 \text{ m}$ )	Normal	Unit Rate	tonnes



MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
158	Excavate and Replace Asphalt Wearing Surface (RAMC only)	Normal	Unit Rate	m <sup>2</sup>
160	Recycling	Normal	Unit Rate	m <sup>3</sup>
161	Profile Planing	Normal	Unit Rate	m <sup>2</sup>
		Normal	Lump Sum	Dollars
169	Other Pavement Work (inform Element Leader)	Prov. Sum	Fixed Price	Dollars
170	Pavement Repairs (RAMC only)	Normal	Unit Rate	m <sup>3</sup>
171	Edge Repair (Manual)	Normal	Unit Rate	tonnes
172	Edge Repairs with Emulsion / Aggregate	Normal	Unit Rate	m <sup>3</sup>
173	Pothole Patching	Normal	Unit Rate	tonnes
174	Pothole Patching with Emulsion / Aggregate	Normal	Unit Rate	m <sup>3</sup>
175	Heavy Patching	Normal	Unit Rate	tonnes
176	Crack Filling	Normal	Unit Rate	Litres
177	Crack Treatment with Emulsion / Aggregate	Normal	Unit Rate	m <sup>3</sup>
178	Crack Treatment with Strain Alleviating Product	Normal	Unit Rate	m <sup>2</sup>
179	Surface Strip Treatment of Cracks	Normal	Unit Rate	Metres
180	Rut Correction	Normal	Unit Rate	tonnes
181	Other Bituminous Surface Work	Normal	Unit Rate	Dollars
		Prov. Sum	Fixed Price	Dollars
182	Pavement Repairs	Normal	Unit Rate	m <sup>2</sup>
183	Subgrade Treatment with Pavement Repair Activity	Normal	Unit Rate	m <sup>3</sup>
184	Scarify and Reshape Existing Pavement	Normal	Unit Rate	m <sup>2</sup>
185	Pavement Repairs, Gravel	Normal	Unit Rate	m <sup>2</sup>
186	Gravel Supply (Supply and Cartage)	Normal	Unit Rate	m <sup>3</sup> (loose)
187	Other Pavement Work (inform Element Leader)	Normal	Unit Rate	Dollars
<b>200</b>	<b>UNSEALED SURFACES</b>			
201	Light Formation Grading	Normal	Unit Rate	km – m Width
202	Medium Formation Grading	Normal	Unit Rate	km
203	Heavy Formation Grading	Normal	Unit Rate	km
204	Gravel / Material Supply – Heavy Formation Grading	Normal	Unit Rate	m <sup>3</sup> (loose)
		Prov. Sum	Fixed Price	Dollars
205	Formation Resheeting – Minor (> 150 m)	Normal	Unit Rate	m <sup>3</sup> (loose)
206	Remove Formation Material and Replace, if required	Normal	Unit Rate	m <sup>3</sup> (loose)

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
207	Formation Mechanical Stabilisation – Minor (> 150 m)	Normal	Unit Rate	m <sup>3</sup> (loose)
		Prov. Sum	Fixed Price	Dollars
208	Accessibility Grading	Normal	Unit Rate	km – m Width
214	Other Formation Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
215	Light Shoulder Grading – Rural	Normal	Unit Rate	Shoulder km Side
216	Heavy Shoulder Grading – Rural	Normal	Unit Rate	Shoulder km Side
217	Light Shoulder Grading – Urban	Normal	Unit Rate	m <sup>2</sup>
218	Heavy Shoulder Grading – Urban	Normal	Unit Rate	m <sup>2</sup>
219	Gravel Supply – Heavy Shoulder Grading	Normal	Unit Rate	m <sup>3</sup> (loose)
		Prov. Sum	Fixed Price	Dollars
220	Shoulder Pothole Patching	Normal	Unit Rate	m <sup>3</sup> (loose)
221	Shoulder Resheeting	Normal	Unit Rate	m <sup>3</sup> (loose)
222	Remove Shoulder Material and Replace, if required	Normal	Unit Rate	m <sup>3</sup> (loose)
229	Other Unsealed Shoulder Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
230	Abnormal Water Cartage	Normal	Unit Rate	ML / km
231	Abnormal Gravel Cartage	Normal	Unit Rate	m <sup>3</sup> (loose) - km
<b>300</b>	<b>DRAINAGE</b>			
301	Install Earth Surface Drains	Normal	Unit Rate	Metres
302	Repair Earth Surface Drains	Normal	Unit Rate	Metres
303	Install Concrete Surface Drains	Normal	Unit Rate	Metres
304	Repair Concrete Surface Drains	Normal	Unit Rate	Metres
305	Clean Earth and Concrete Surface Drains	Normal	Unit Rate	Metres
306	Repair or Replace Concrete Slabs, Paving Blocks, Kerbs and Dykes	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
310	Installation and Removal of Erosion and Sediment Control Measures – Minor	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
311	Maintenance of Erosion and Sediment Control Measures	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
312	Service Sedimentation Ponds	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
313	Repair Sedimentation Ponds	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
319	Other Surface Drain Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
320	Replace Minor Culverts and Pipes	Normal	Unit Rate	Metres

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
321	Clean Culverts, Pipes and Pits – Minor	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
322	Clean Culverts, Pipes and Pits – Major	Normal	Unit Rate	m <sup>3</sup>
		Prov. Sum	Fixed Price	Dollars
323	Repair Minor Concrete Culverts, Pipes and Pits	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
324	Repair Minor Steel Drainage Structures	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
325	Repair Inlet and Outlet Scour	Normal	Unit Rate	m <sup>3</sup>
326	Repair Scour Blocks	Normal	Unit Rate	m <sup>3</sup>
327	Replace or Install Cut-Off Walls	Normal	Unit Rate	m <sup>3</sup>
328	Minor Repairs to Erosion Sites	Prov. Sum	Fixed Price	Dollars
329	Other Minor Culvert, Pipe and Pit Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
330	Install Subsoil Drains	Normal	Unit Rate	Metres
331	Inspect and/or Clean Out Subsoil Drains	Normal	Unit Rate	Metres
332	Repair Subsoil Drains	Normal	Unit Rate	Dollars
		Prov. Sum	Fixed Price	Dollars
333	Repair Subsoil Drains (RAMC)	Normal	Unit Rate	Metres
334	Clean Culverts, Pipes and Pits - Minor (RAMC only)	Normal	Unit Rate	Metres
339	Other Subsoil Drain Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
340	Clean Floodways	Normal	Unit Rate	m <sup>2</sup>
341	Repair Floodways	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
342	Repair Floodway Slopes and Margins	Normal	Unit Rate	m <sup>3</sup>
		Prov. Sum	Fixed Price	Dollars
349	Other Floodway Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
<b>400</b>	<b>ROADSIDE</b>			
401	Tractor Slashing – Rural	Normal	Unit Rate	Hectares
402	Tractor Slashing – Urban	Normal	Unit Rate	Hectares
403	Tractor Slashing – Boom Mower	Normal	Unit Rate	m <sup>2</sup>
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
404	Hand Mowing	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
		Normal	Lump Sum	Dollars

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
405	Clearing	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
406	Herbicide Spot Spraying – Declared Plants	Prov. Sum	Fixed Price	Dollars
407	Herbicide Spraying	Normal	Unit Rate	Litres
		Prov. Sum	Fixed Price	Dollars
408	Tractor Treatment – Chemical	Normal	Unit Rate	Hectares
409	Seeding or Planting	Normal	Unit Rate	m <sup>2</sup>
410	Landscape Planting – Urban	Normal	Unit Rate	Each (Plant)
411	Maintain Landscaping – Minor	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
412	Mulching	Normal	Unit Rate	m <sup>2</sup>
414	Management of Invasive Animal Species	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	m <sup>2</sup>
415	Roadside Burning Off	Normal	Unit Rate	Hectares
		Prov. Sum	Fixed Price	Dollars
416	Construction / Maintenance of Mineral Earth Fire Break	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	m <sup>2</sup>
418	Clearing of Roadside Hazards	Prov. Sum	Fixed Price	Dollars
419	Other Vegetation Control Works	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
420	Roadside Litter Collection – Rural	Normal	Unit Rate	m <sup>3</sup>
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
421	Roadside Litter Collection – Urban	Normal	Unit Rate	m <sup>3</sup>
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
422	Graffiti Removal	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
423	Roadside Sweeping	Normal	Unit Rate	Metres
424	Removal of Unauthorised Signs	Normal	Unit Rate	Each (Sign)
425	Earthworks, Visibility Clearing	Normal	Unit Rate	m <sup>3</sup>
426	Repair Minor Stability Problems	Normal	Unit Rate	m <sup>3</sup>
427	Maintenance of Cultural Heritage Site	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
429	Other Roadside Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
430	Service Restoration	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
439	Other Restoration Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
440	Rest Area Servicing	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
441	Driver Reviver Site Servicing	Normal	Lump Sum	Dollars
449	Other Services Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
450	Call Out Service	Prov. Sum	Fixed Price	Dollars
452	Emergency Call Out Activities	Prov. Sum	Fixed Price	Dollars
453	Incident Response (RAMC)	Prov. Sum	Fixed Price	Dollars
455	Call Outs Required as a Result of Normal Defects	Prov. Sum	Fixed Price	Dollars
460	Management of Declared Plants	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
<b>500</b>	<b>ROAD FURNITURE</b>			
501	Install New, Relocate or Replace Existing Signs ≤ 1 m <sup>2</sup> (excluding Guide Signs)	Normal	Unit Rate	Each (Sign)
502	Repair Signs ≤ 1 m <sup>2</sup> (excluding Guide Signs)	Normal	Unit Rate	Each (Sign)
		Prov. Sum	Fixed Price	Dollars
503	Install New, Relocate or Replace Existing Signs > 1 m <sup>2</sup> (excluding Guide Signs)	Normal	Unit Rate	Each (Sign)
504	Cleaning Signs	Normal	Unit Rate	Each (Sign)
505	Install New or Replace Existing Guide Signs	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
506	Repair Guide Signs	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
507	Relocate Guide Signs	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
508	Repair Signs > 1 m <sup>2</sup> (excluding Guide Signs)	Normal	Unit Rate	Each (Sign)
		Prov. Sum	Fixed Price	Dollars
509	Other Sign Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
510	Install New Guide Markers	Normal	Unit Rate	Each (Marker)
511	Clean and/or Paint Guide Markers	Normal	Unit Rate	Each (Marker)
512	Repair or Replace Guide Markers	Normal	Unit Rate	Each (Marker)
		Prov. Sum	Fixed Price	Dollars
513	Replace Guide Post Delineators	Normal	Unit Rate	Each (Delineator)
514	Repair Guide Markers	Normal	Unit Rate	Each (Marker)
515	Replace Guide Markers	Normal	Unit Rate	Each (Marker)

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
519	Other Guide Post and Marker Work	Normal	Unit Rate	Each
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
520	Install New Guard Rail, Barrier Furniture	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
521	Clean and/or Paint Guard Rail, Barrier Furniture	Normal	Unit Rate	Metres
522	Repair or Replace Guard Rail, Barrier Furniture	Normal	Unit Rate	Dollars
		Prov. Sum	Fixed Price	Dollars
523	Repair Guard Rail, Barrier Furniture	Normal	Unit Rate	Metres
524	Replace Guard Rail, Barrier Furniture	Normal	Unit Rate	Metres
525	Replace Guard Rail Delineators	Normal	Unit Rate	Each (Delineator)
530	Repair Wire Rope Barrier	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
531	Upgrade Existing Barrier End	Normal	Unit Rate	Each
532	Repair Ingal Barrier	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
533	Upgrade Existing Barrier	Normal	Unit Rate	Metres
534	Repair Impact Barrier Furniture	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
550	Emergency Roadside Phone Repairs	Normal	Unit Rate	Each (Phone)
		Prov. Sum	Fixed Price	Dollars
551	Emergency Roadside Phone Servicing	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
559	Other Furniture Repairs	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
560	Maintenance of Noise Barriers – Minor	Prov. Sum	Fixed Price	Dollars
<b>600</b>	<b>LIGHTING AND TRAFFIC SIGNALS</b>			
601	Replace Traffic Signal Lamps and Clean Lanterns – Bulk Change	Normal	Unit Rate	Each (Lamp)
		Prov. Sum	Fixed Price	Dollars
602	Replace Traffic Signal Defective Lamps and Clean Lanterns – Emergent Change	Normal	Unit Rate	Each (Lamp)
		Prov. Sum	Fixed Price	Dollars
603	Sch Install/Replace/Clean Lum (& SLC as applic)(Route Light)	Normal	Unit Rate	Each
		Prov. Sum	Fixed Price	Dollars
604	Unsch Install/Replace/Clean Lum (& SLC as applic)(RouteLght)	Normal	Unit Rate	Each
		Prov. Sum	Fixed Price	Dollars
605	Clean Traffic Signal Lanterns – Scheduled – Bulk	Normal	Unit Rate	Each (Lamp)
606	Modify Traffic Signals – Add Lanterns	Normal	Unit Rate	Each (Lantern)



MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
607	Modify Traffic Signals – Remove Lanterns	Normal	Unit Rate	Each (Lantern)
608	Luminaires (excl. Route Lighting), Solar Lighting and Arrays	Normal	Unit Rate	Each
		Prov. Sum	Fixed Price	Dollars
609	Light & Power Infrastructure (excl. Luminaires/SLCs/Lamps)	Normal	Unit Rate	Each
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
610	Traffic Signal Operational and Controller Inspect & Service	Prov. Sum	Fixed Price	Dollars
611	Sch Replace Smart Lighting Controller Only (Route Lighting)	Normal	Unit Price	Each
		Prov. Sum	Fixed Price	Dollars
612	Unsch Replace Smart Light Controller Only (Route Lighting)	Normal	Unit Price	Each
		Prov. Sum	Fixed Price	Dollars
618	Scheduled / Planned Traffic Signal Work	Normal	Unit Price	Dollars
		Prov. Sum	Fixed Price	Dollars
619	Unscheduled / Unplanned Traffic Signal Work	Normal	Unit Rate	Each
		Prov. Sum	Fixed Price	Dollars
620	Repair Inductive Loops – Minor Damage	Normal	Unit Rate	Each (Joint)
621	Inductive Loops (Recut Loops)	Normal	Unit Rate	Each (Joint)
622	Install New Traffic Signal Configuration File	Prov. Sum	Fixed Price	Dollars
623	Replace Pedestrian Crossing Push Buttons	Normal	Unit Rate	Each (Set)
		Prov. Sum	Fixed Price	Dollars
624	Traffic Signal Co-ordination Servicing	Normal	Lump Sum	Dollars
625	Road Safety Camera Works – General	Prov. Sum	Fixed Price	Dollars
627	Closed Circuit Television (CCTV) Maintenance	Prov. Sum	Fixed Price	Dollars
628	Variable Messaging Signs (VMS) Maintenance	Prov. Sum	Fixed Price	Dollars
629	Routine Traffic Management Equipment Servicing	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
630	Accident Damage – Traffic Signals	Prov. Sum	Fixed Price	Dollars
		Prov. Sum	Fixed Price	Dollars
631	Accident / Storm Damage – Re-Aim Traffic Signal Lanterns	Normal	Unit Rate	Each (Lantern)
		Prov. Sum	Fixed Price	Dollars
632	Accident Damage – Replace Traffic Signal Lanterns, Posts and Foundations	Normal	Unit Rate	Each (Pole)
		Prov. Sum	Fixed Price	Dollars
633	Accident Damage – Replace Traffic Signal Post and Foundations and Reinstall Lanterns from Old Pole	Normal	Unit Rate	Each (Pole)
		Prov. Sum	Fixed Price	Dollars
634	Reinstall Damaged Route Lighting Poles and Lighting	Normal	Unit Rate	Each (Pole)

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
635	Repair Minor Damage to Electrical Pits	Normal	Unit Rate	Each (Pit)
637	Replace Damaged Electrical Pit Covers	Normal	Unit Rate	Each (Lid)
		Prov. Sum	Fixed Price	Dollars
638	Replace Damaged Electrical Pit Lids – Route Lighting	Normal	Unit Rate	Each (Pit)
		Prov. Sum	Fixed Price	Dollars
639	Replace / Repair Damaged Electrical Pit Lids – Route Lighting	Normal	Unit Rate	Each (Pit)
		Prov. Sum	Fixed Price	Dollars
640	Repair Damaged Electrical Pits	Normal	Unit Rate	Each (Pit)
		Prov. Sum	Fixed Price	Dollars
641	Repaint Traffic Signal Controller	Normal	Unit Rate	Each (Controller)
642	Repaint Traffic Signal Mast Arms (including Hardware)	Normal	Unit Rate	Each (Mast Arm)
643	Repaint Traffic Signal Poles (including Hardware)	Normal	Unit Rate	Each (Pole)
644	Repaint Route Lighting Poles (including Hardware)	Normal	Unit Rate	Each (Pole)
650	Emergency 'Make Safe' Callout – Traffic Signals	Prov. Sum	Fixed Price	Dollars
651	Emergency 'Make Safe' Callout – Lighting	Prov. Sum	Fixed Price	Dollars
660	Electrical Safety Inspections – Traffic Signals	Prov. Sum	Fixed Price	Dollars
661	Electrical Safety Inspections – ITS Devices Signals	Prov. Sum	Fixed Price	Dollars
662	Electrical Safety Inspections – Route Lighting	Prov. Sum	Fixed Price	Dollars
<b>700</b>	<b>TRAFFIC DELINEATION</b>			
701	Repaint Road Centre Lines – Minor	Normal	Unit Rate	Line km
702	Repaint Road Centre Lines – Major	Normal	Unit Rate	Line km
703	Repaint Double Barrier Lines – Daywork	Normal	Unit Rate	Line km
704	Paint New Yellow Line	Normal	Unit Rate	Line km
		Prov. Sum	Fixed Price	Dollars
705	Repaint Yellow Line	Normal	Unit Rate	Line km
		Prov. Sum	Fixed Price	Dollars
706	Spotting for Yellow Lines	Normal	Unit Rate	Line km
		Prov. Sum	Fixed Price	Dollars
707	Repaint Unbroken Road Centre Lines (150 mm Width)	Normal	Unit Rate	Line km
		Prov. Sum	Fixed Price	Dollars
709	Repaint Double Barrier Line – General	Normal	Unit Rate	Line km
710	Repaint Road Edge Lines – Minor	Normal	Unit Rate	Line km
711	Repaint Road Edge Lines – Major	Normal	Unit Rate	Line km
712	Repaint Edge Line – 100 mm Width	Normal	Unit Rate	Line km

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
713	Repaint Edge Line – 150 mm Width	Normal	Unit Rate	Line km
714	Repaint Unbroken Lane Line – General	Normal	Unit Rate	Line km
719	Repaint Single Barrier Line – General	Normal	Unit Rate	Line km
720	Repaint Single Broken Lines	Normal	Unit Rate	Line km
721	Repaint Barrier Broken Lines	Normal	Unit Rate	Line km
722	Repaint Broken Lane Line – General	Normal	Unit Rate	Line km
723	Repaint Continuity Line – General	Normal	Unit Rate	Line km
724	Repaint Broken Line – General	Normal	Unit Rate	Line km
725	Repaint 150 mm Outline – General	Normal	Unit Rate	Line km
729	Urban Line Marking – Minor	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
730	Repaint Lateral Markings	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
731	Repaint Road Markings	Normal	Unit Rate	m <sup>2</sup>
735	Thermoplastic Line Marking	Normal	Unit Rate	m <sup>2</sup>
736	Audio Tactile Line Marking (ATLM)	Normal	Unit Rate	Line km
740	Installation of Raised Pavement Markers	Normal	Unit Rate	Each (Marker)
745	Remove Longlines and then Child Numbers for Water Blasting, Grinding	Normal	Unit Rate	Line km
		Prov. Sum	Fixed Price	Line km
750	Remove Lateral Markings and then Child Numbers for Water Blasting, Grinding	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
759	Line Marking – General	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
760	Coloured Surface Treatments and then Child Numbers for Town Entry Treatments, Bikeways, School Zones, Wildlife, Busway Entry	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
770	Retro Reflectivity Testing	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
780	Skid Resistance Testing	Prov. Sum	Fixed Price	Dollars
<b>800</b>	<b>STRUCTURES</b>			
809	Routine Bridge Servicing (RAMC)	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
815	Replace / Repair Expansion Joints (Concrete)	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
819	Bridgework, Other Structural (Concrete)	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
820	Clean / Repaint Steel Elements	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
822	Repair Minor Damage to Steel Elements	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
823	Replace / Repair Expansion Joints (Steel)	Normal	Unit Rate	Metres
829	Bridgework, Other Structural (Steel)	Normal	Lump Sum	Dollars
833	Reinstate Timber Piles	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
834	Repair / Replace Timber Corbels	Normal	Unit Rate	Each
835	Repair / Replace Timber Headstocks	Normal	Unit Rate	Each
836	Replace Timber Girders	Normal	Unit Rate	Each
837	Replace Deck Planks with New Planks	Normal	Unit Rate	m <sup>2</sup>
838	Repair / Replace Kerbs	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
849	Bridgework, Other Structural (Timber)	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
850	Replace / Repair Relieving Slabs	Normal	Unit Rate	m <sup>3</sup>
		Prov. Sum	Fixed Price	Dollars
851	Repair Spalled and Cracked Structural Concrete Elements (Concrete Bridges)	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
852	Repair Spalled and Cracked Structural Concrete Elements (Timber Bridges)	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
853	Repair Spalled and Cracked Structural Concrete Elements (Steel Bridges)	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
855	Repair / Replace Batter Protection	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
859	Bridgework – General	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
860	Routine Grid Servicing	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
861	Repair or Replace Grids	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
862	Widen / Replace Narrow Grids	Prov. Sum	Fixed Price	Dollars
863	Clean / Maintain Drainage Components	Prov. Sum	Fixed Price	Dollars
864	Tighten Existing Bolts – Steel and Concrete Structures	Prov. Sum	Fixed Price	Dollars
865	Rail Crossing Servicing	Normal	Lump Sum	Dollars
870	Repair Noise Barriers	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
875	Repair Restraining Structures – Gabions, Reinforced Walls	Normal	Unit Rate	m <sup>2</sup>

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
876	Footway Deck Wearing Surface Repairs (Manual or Mechanical)	Normal	Unit Rate	tonnes
877	Repair Scouring / Deposition of Waterway Material	Normal	Unit Rate	m <sup>3</sup>
		Prov. Sum	Fixed Price	Dollars
878	Remove Flood Debris from Waterways	Normal	Unit Rate	m <sup>3</sup>
879	Maintain Clear Waterways	Prov. Sum	Fixed Price	Dollars
880	Repair Roadside Fences	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
882	Maintain Existing Waterway Protection	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
883	Seal Gaps between Culvert Elements / Wingwalls	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
884	Repair Handrail / Barrier / Guard Rail Furniture	Normal	Unit Rate	Metres
		Prov. Sum	Fixed Price	Dollars
885	'Make Safe' Accident Damage to Handrail / Barrier / Guard Rail Furniture	Prov. Sum	Fixed Price	Dollars
886	Install / Maintain Bird Control Fencing	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
887	Place Emergency Propping	Prov. Sum	Fixed Price	Dollars
888	Clean Aggressive Contaminations from Steel Girders	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
889	Emergency Pavement Repairs on Structures (< 10 m <sup>2</sup> )	Normal	Unit Rate	m <sup>2</sup>
890	Service Passenger Facilities	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
891	Repair Passenger Facilities	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
892	Tunnel Maintenance / Servicing – General	Normal	Unit Rate	Month
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
895	Tunnel Maintenance / Servicing – General	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
896	Maintain Ground Area around Foundation(s) of Fabricated Structures for Traffic Signs (FSTS)	Normal	Unit Rate	m <sup>2</sup>
		Prov. Sum	Fixed Price	Dollars
899	Other Miscellaneous Structure Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
<b>900</b>	<b>OVERHEADS</b>			
901	RMPC Joint Maintenance Requirement Assessment	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars

MAINTENANCE ACTIVITY Number and description		Work type	Payment type	ACTIVITY Payment unit of measurement
902	Open Tender Establishment Setup Works	Normal	Unit Rate	Each
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
903	Inspections for Forward List of Works	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
904	Asset Management Fee	Normal	Lump Sum	Dollars
905	Community Engagement – Program Maintenance	Prov. Sum	Fixed Price	Dollars
906	Community Engagement – Rehabilitation	Prov. Sum	Fixed Price	Dollars
907	Prepare Cultural Heritage Management Plan	Prov. Sum	Fixed Price	Dollars
908	Implement, Monitor and Maintain Cultural Heritage Plan	Prov. Sum	Fixed Price	Dollars
910	Preparation of Environmental Management Plan (Maintenance)	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
911	Implementation, Monitoring and Maintenance of Environmental Management Plan (Maintenance)	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
912	Payment of Permits and Fees (Environmental)	Prov. Sum	Fixed Price	Dollars
920	Electricity Supply – Traffic Signals	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
921	Electricity Supply – Lighting	Prov. Sum	Fixed Price	Dollars
922	Phone Charges – Traffic Signals	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
923	Phone Charges – Traffic Signal Coordination	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
930	Modify and Digitise Computerised As Constructed Plans	Normal	Unit Rate	Each
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
931	Modify Paper-Based As Constructed Plans	Normal	Unit Rate	Each
		Normal	Lump Sum	Dollars
932	Calibration of Road Safety Cameras	Prov. Sum	Fixed Price	Dollars
933	Survey Drawings for Road Safety Cameras	Prov. Sum	Fixed Price	Dollars
950	Damages Recovery	Prov. Sum	Fixed Price	Dollars
960	Alliance Performance Limb Payment	Prov. Sum	Fixed Price	Dollars
970	Licence and Ongoing Maintenance Fees for Transport and Main Roads Accepted Maintenance Management Systems (max. \$5,000 year / contract organisation)	Normal	Lump Sum	Dollars



## 5.2 Maintenance Activity Standards

### 100 SEALED SURFACES

#### 101 Edge Repair (Manual)

##### Description

The manual repair with asphalt or premix of isolated lengths of sealed pavement to restore the edges to line and level. Edge Repair (Manual) should be used for isolated repairs which are less than or equal to 5 m in length and where the cumulative length of isolated repairs in any 100 m section is less than or equal to 25 m. Edge Repair (Mechanical) – Activity Number 102 shall be used for repairs where more than 5 m of continuous length is required; or where a combination of repair lengths (i.e. less than and greater than 5 m) occurs within any 100 m section; or where the cumulative length of isolated repairs (i.e. less than or equal to 5 m) is greater than 25 m in any 100 m section.

##### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- preparation of the work area - refer to Applicable Specifications
- the supply and application of a bitumen emulsion tack coat - refer to Applicable Specifications
- the supply, placement and compaction of the asphalt or premix - refer to Applicable Specifications
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

##### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	Premix Asphalt
SS	Shoulder Gravel

All cracked or loose material shall be removed from the area to be repaired. A vertical face at least 20 mm high shall be formed along the edge of the existing sealed pavement.

The horizontal and vertical faces of the area to be repaired shall be sprayed with a tack coat of bitumen emulsion and the tack coat shall overlap slightly the existing seal.

### Restoration Standards

The seal width shall be restored to within 30 mm of the original line of the seal edge.

The finished surface shall be within + 5 mm of the height of and conform to the shape of the surrounding road surface.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
101	Edge Repair (Manual)	tonnes

### Testing Requirements

Minimum Test Frequency	
Asphalt / Premix	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Horizontal Straightedge	
Transverse Q712	2 / Lot minimum
Longitudinal Alignment Q712	1 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?

5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Determine whether a manual or mechanical edge repair method is more efficient:  
Manual - up to approximately 5 m isolated length, or  
Mechanical - more than approximately 20 m continuous lengths.
8. Note if line marking will be required. Schedule another Activity.
9. Specify the appropriate plant, material and crew (including quantities of materials) and organise these.
10. Schedule waterproofing (Activity Number 118) within four weeks if a cold laid premix is used and a reseal is not scheduled in that period.

## **102 Edge Repair (Mechanical)**

### **Description**

The machine repair (e.g. using a profiler and flowcon equipment or similar) with asphalt or premix of sealed pavement edges to line and level. Edge Repair (Mechanical) – Activity Number 102 shall be used for repairs where more than 5 m of continuous length is required; or where a combination of repair lengths (i.e. less than and greater than 5 m) occurs within any 100 m section; or where greater than 25 m of isolated repairs (i.e. repairs that are less than or equal to 5 m in length) occurs within any 100 m section. Edge Repair (Manual) – Activity Number 101 shall be used for isolated repairs which are up to approximately 5 m in length (max).

### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- preparation of the work area - refer to Applicable Specifications
- the supply and application of a bitumen emulsion tack coat - refer to Applicable Specifications
- the supply, placement and compaction of the asphalt or premix - refer to Applicable Specifications
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	Premix Asphalt
SS	Shoulder Gravel

All cracked or loose material shall be removed from the area to be repaired. A vertical face at least 20 mm high shall be formed along the edge of the existing sealed pavement.

The horizontal and vertical faces of the area to be repaired shall be sprayed with a tack coat of bitumen emulsion and the tack coat shall overlap slightly the existing seal.

Where an item for establishment / disestablishment of paver and paving gang at paving site is provided in the schedule of work items, the following Work Operations shall apply:

1. Transport of plant and personnel to the work site
2. Storage of plant adjacent to the site
3. Accommodation of personnel adjacent to the site, and
4. Transport of plant and personnel from the site.

### Restoration Standards

The seal width shall be restored to within 30 mm of the original line of the seal edge.

The finished surface shall be within + 5 mm of the height of and conform to the shape of the surrounding road surface.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
102	Edge Repair (Mechanical)	tonnes

### Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Units of Measurement
	Establishment / disestablishment of paver and paving gang at paving site	Each
955110	Preparation of existing surface	m <sup>2</sup>

Supplementary Work Item	Description	Units of Measurement
955020	Tack coat m <sup>2</sup>	Litres
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
955870	Dense graded asphalt pavement, 20 mm mix	tonnes
	Cold-mixed asphalt pavement	tonnes

### Testing Requirements

Minimum Test Frequency	
Asphalt / Premix	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Horizontal Straightedge	
Transverse Q712	2 / Lot minimum
Longitudinal Alignment Q712	1 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Determine whether a manual or mechanical edge repair method is more efficient:
  - Manual - up to approximately 5 m isolated lengths, or
  - Mechanical - more than approximately 20 m continuous lengths.
8. Note if line marking will be required. Schedule another Activity.

9. Specify the appropriate plant, material and crew (including quantities of materials) and organise these. Ensure the surfacing material will give a texture consistent with the adjoining road, or schedule texturing, and
10. Schedule waterproofing (Activity Number 118) within four weeks if a cold laid premix is used and a reseal is not rescheduled in that period.

### 103 Edge Repair with Emulsion / Aggregate

#### Description

The machine repair with graded aggregate and emulsion using blower type compaction equipment of sealed pavement edges to line and level. Includes surface preparation and tack coating.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

All cracked or loose material shall be removed from the area to be repaired.

The horizontal and vertical faces of the area to be repaired shall be sprayed with a tack coat of bitumen emulsion and the tack coat shall overlap slightly the adjacent seal.

The aggregate shall be an approved mix of 5 mm, 7 mm and/or 10 mm crushed rock or crushed gravel conforming to MRTS22 *Supply of Cover Aggregate*. It shall be uniformly coated with bitumen emulsion. The quantity of bitumen emulsion incorporated in the aggregate shall be sufficient to prevent aggregate stripping from the patch but not so much as to cause a fatty surface.

The coated aggregate shall be projected by the air jet onto the prepared surface so that it forms a compacted interlocking mass.

If required to prevent pick-up by traffic, a single layer of dry stone shall be spread over the coated aggregate.

Loose stone shall be swept from the patched area and the adjoining pavement.

#### Restoration Standards

The seal width shall be restored to within 30 mm of the original line of the seal edge.

The finished surface shall be within  $\pm 5$  mm of the height of and conform to the shape of the surrounding road surface.

The patch shall not exhibit stripping of aggregate or bleeding of bitumen.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
103	Edge Repair with Emulsion / Aggregate	m <sup>3</sup> (loose)



**Testing Requirements**

<b>Minimum Test Frequency</b>	
<b>Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
<b>Horizontal Straightedge</b>	
Transverse Q712	2 / Lot minimum
Longitudinal Alignment Q712	1 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Determine whether a minor or major edge repair is more efficient:
  - Minor - up to approximately 5 m isolated lengths, or
  - Major - more than approximately 20 m continuous lengths.
8. Note if line marking will be required. Schedule another Activity, and
9. Specify the appropriate plant, material and crew (including quantities of materials) and organise these. Ensure the surfacing material will give a texture as consistent as possible with the adjoining road.

## 105 Pothole Patching

### Description

The repair with asphalt or premix of an isolated hole or series of holes in the sealed roadway surface that is in otherwise sound condition.

### Note:

The repair of potholes in other than sound pavement (i.e. there is a presence of other defects such as cracking, shoving, rutting etc) should be carried out under a different Activity (e.g. Activity Number 142, 143 etc) depending on the situation and the appropriate response time required. In deciding the most appropriate Activity to use, consideration should be given to any impending construction / rehabilitation that may be programmed for the area. This will help to achieve the most efficient choice of the Maintenance Activity required (i.e. a temporary repair – Activity Number 142, or a more permanent repair – Activity Numbers 105 or 107).

### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the removal of any cracked or loose material from the area to be repaired
- the formation of a vertical face on the hole edges. The edges of the hole are to be cleaned and shaped in the form of a rectangle
- the supply and application of a bitumen emulsion tack coat – refer to Applicable Specifications
- the supply, placement and compaction of the asphalt or premix
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	Premix Asphalt

### Restoration Standards

The finished surface shall be within  $\pm 5$  mm of the height of and conform to the shape of the surrounding road surface.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

No loose material shall be left on sealed carriageway.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
105	Pothole Patching	tonnes

### Testing Requirements

Minimum Test Frequency	
Asphalt / Premix	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Horizontal Straightedge	
Horizontal Straightedge Q712	2 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, either:
  - a. schedule another Activity to repair it, or
  - b. extend the area of the pothole repair to include it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.

7. Remember when scheduling the work that potholes in the wheel path deteriorate rapidly, and
8. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## 106 Pothole Patching with Emulsion / Aggregate

### Description

The machine repair of an isolated hole or series of holes in the roadway bituminous surface with graded aggregate and emulsion using blower type compaction equipment. Includes surface preparation and tack coating.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

All cracked or loose material shall be removed from the area to be repaired.

The horizontal and vertical faces of the area to be repaired shall be sprayed with a tack coat of bitumen emulsion and the tack coat shall overlap slightly the adjacent seal.

The aggregate shall be an approved mix of 5 mm, 7 mm and/or 10 mm crushed rock or crushed gravel conforming to MRTS22 *Supply of Cover Aggregate*. It shall be uniformly coated with bitumen emulsion. The quantity of bitumen emulsion incorporated in the aggregate shall be sufficient to prevent aggregate stripping from the patch but not so much as to cause a fatty surface.

The coated aggregate shall be projected by the air jet onto the prepared surface so that it forms a compacted interlocking mass.

If required to prevent pick-up by traffic, a single layer of dry stone or sand shall be spread over the coated aggregate.

Loose stone shall be swept from the patched area and the adjoining pavement.

### Restoration Standards

The finished surface shall be within  $\pm 5$  mm of the height of and conform to the shape of the surrounding road surface.

The patch shall not exhibit stripping of aggregate or bleeding of bitumen.

No loose material shall be left on the sealed carriageway.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
106	Pothole Patching with Emulsion / Aggregate	m <sup>3</sup> (loose)

**Testing Requirements**

<b>Minimum Test Frequency</b>	
<b>Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
<b>Horizontal Straightedge</b>	
Horizontal Straightedge Q712	2 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

**WORK PREPARATION****Plant Requirements**

Job truck

Blower type patching machine (including truck)

**Materials**

Aggregate to MRTS22 *Supply of Cover Aggregate*

Emulsion to MRTS21 *Bituminous Emulsion*

TRPMs / paint

**Manpower Requirements**

Leading hand                    1

Labourer                         1

Truck driver                    1

Traffic controllers            2

**Average Daily Production**

4 m<sup>3</sup> (loose aggregate)

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.

2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, either:
  - a. schedule another Activity to repair it, or
  - b. extend the area of the pothole repair to include it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Remember, when scheduling the work, that potholes in the wheel path deteriorate rapidly, and
8. Specify the appropriate plant, material and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - see Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. should be marked out already.
3. Remove all loose and cracked material from within the edge break and around the pothole edges:
  - a. joint face at least 15 mm deep
  - b. clean face and base, and
  - c. solid base.
4. Tack coat the sides and bottom with emulsion:
  - a. light, even coat
  - b. avoid pooling, and
  - c. allow emulsion to break.
5. Pneumatically place bitumen emulsion coated aggregate:
  - a. spread evenly.
6. Apply dry cover material, if specified by your supervisor.
7. Check the work against the Restoration Standards.

8. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
9. Re-establish line marking:
  - a. use TRPMs or spotting.
10. Remove traffic control:
  - a. clean / repair, as necessary.

## 107 Heavy Patching

### Description

The repair with asphalt or premix of any hole or series of holes in the roadway surface that is in otherwise sound condition which results in a total patched area greater than 10 m<sup>2</sup>.

### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the removal of any cracked or loose material from the area to be repaired
- the formation of a vertical face on the hole edges. The edges of the hole are to be cleaned and shaped in the form of a rectangle
- the supply and application of a bitumen emulsion tack coat – refer to Applicable Specifications
- the supply, placement and compaction of the asphalt or premix
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS21	<i>Bituminous Emulsion</i>



Reference	Title
MRTS30	<i>Asphalt Pavements</i>
SS	Premix Asphalt

### Restoration Standards

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

The finished surface shall be within  $\pm 5$  mm of the height of and conform to the shape of the surrounding road surface.

No loose material shall be left on sealed carriageway.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
107	Heavy Patching	tonnes

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
	Establishment / disestablishment of paver and paving gang at paving site	Each
955810	Preparation of existing surface	m <sup>2</sup>
955820	Tack coat m <sup>2</sup>	Litres
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
955870	Dense graded asphalt pavement, 20 mm mix	tonnes
	Cold-mixed asphalt pavement	tonnes

### Testing Requirements

Minimum Test Frequency	
Asphalt / Premix	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Horizontal Straightedge	
Horizontal Straightedge Q712	2 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities

may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified.

#### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, either:
  - a. schedule another Activity to repair it, or
  - b. extend the area of the repair to include it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Note if road marking will be required. Schedule another Activity.
8. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
9. Arrange and specify a disposal area for excavated material, and
10. Schedule waterproofing (Activity Number 118) within four weeks if a cold laid premix is used and a reseal is not scheduled in that period.

#### **108 Edge Repair (RAMC only)**

Details to be advised.

#### **110 Surface Correction with Premix / Asphalt (Manual) – Minor (< 150 m / km)**

##### **Description**

The application by hand of a premix or asphalt levelling course to distorted and rutted areas of the bituminous surface.

##### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- preparation of the work area - refer to Applicable Specifications
- the supply and application of a bitumen emulsion tack coat - refer to Applicable Specifications
- the supply, placement and compaction of the asphalt or premix - refer to Applicable Specifications
- all other operations in the Applicable Specifications

- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	Premix Asphalt

#### Restoration Standards

The finished surface shall be within + 5 mm of the height of and conform to the shape of the surrounding road surface.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

Install TRPMs and/or spotting, if required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
110	Surface Correction with Premix / Asphalt (Manual) – Minor (< 150 m / km)	tonnes

#### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
955810	Preparation of existing surface	m <sup>2</sup>
955820	Tack coat m <sup>2</sup>	Litres
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
955870	Dense graded asphalt pavement, 20 mm mix	tonnes
	Cold-mixed asphalt pavement	tonnes

#### Testing Requirements

Minimum Test Frequency	
Asphalt / Premix	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year

<b>Minimum Test Frequency</b>	
<b>Asphalt / Premix</b>	
	> 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
<b>Horizontal Straightedge</b>	
Horizontal Straightedge Q712	1 / Repair

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

#### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair.
6. Determine whether a manual or mechanical correction repair is more efficient:
  - Manual - up to approximately 10 m<sup>2</sup> in isolated areas, or
  - Mechanical - more than approximately 10 m<sup>2</sup> in one area.
7. Note if road marking will be required. Schedule another Activity.
8. Specify the appropriate plant, materials and crew (including quantities of material) and organise these, and
9. Schedule waterproofing (Activity Number 118) within four weeks if a cold laid premix is used and a reseal is not scheduled in that period.

#### **111 Surface Correction with Premix / Asphalt (Mechanical) – Minor (< 150 m / km)**

##### **Description**

The application by machine (e.g. paver, flowcon) of premix or asphalt levelling course to distorted and rutted areas of the bituminous surface.

##### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and material
- establishment and disestablishment of traffic control
- determination of the work area

- preparation of the existing surface, including the installation of offset points for the spotting of the centre and edge lines upon completion of the overlay
- the supply and application of a bitumen emulsion tack coat – refer Applicable Specifications
- the supply, placement and compaction of the asphalt
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	Premix Asphalt

#### Restoration Standards

As per Applicable Specifications above.

The finished surface shall be within  $\pm 5$  mm of the height of and conform to the shape of the surrounding road surface.

Install TRPMs and/or spotting, if required.

The Contractor shall demonstrate compliance with the requirements of MRTS30 *Asphalt Pavements* with respect to rolling pattern requirements and temperature at time of rolling commencement.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
111	Surface Correction with Premix / Asphalt (Mechanical) – Minor (< 150 m / km)	tonnes

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
	Establishment / disestablishment of paver and paving gang at paving site	Each
955810	Preparation of existing surface	m <sup>2</sup>
955820	Tack coat m <sup>2</sup>	Litres
955850	Dense graded asphalt pavement, 10 mm mix	tonnes
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
955870	Dense graded asphalt pavement, 20 mm mix	tonnes
	Cold-mixed asphalt pavement	tonnes

**Testing Requirements**

<b>Minimum Test Frequency</b>	
<b>Asphalt / Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Temperature at Time of Rolling Commencement	6 / Lot
<b>Horizontal Straightedge</b>	
Horizontal Straightedge Q712	1 / 10 m
Maximum Lot Size	One day
<b>Asphalt / Premix Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Determine whether a manual or mechanical correction repair method is more efficient:
  - Manual - up to approximately 10 m<sup>2</sup> in isolated areas, or
  - Mechanical - more than approximately 10 m<sup>2</sup> in one area.
8. Note if road marking will be required. Schedule another Activity.
9. Consider subcontracting options.
10. Specify the appropriate plant, materials and crew (including quantities of material) and organise these, and
11. Schedule waterproofing (Activity Number 118) within four weeks if a cold laid premix is used and a reseal is not scheduled in that period.

### 112 Surface Correction with Emulsion / Aggregate – Minor (< 150 m / km)

#### Description

The application of graded aggregate and emulsion using blower type compaction equipment to level distorted and rutted areas of the roadway bituminous surface. Includes surface preparation and tack coating.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

All cracked or loose material shall be removed from the area to be repaired.

The area to be repaired shall be sprayed with a tack coat of bitumen emulsion and the tack coat shall extend slightly beyond the area to receive the coated aggregate.

The aggregate shall be an approved mix of 5 mm, 7 mm and/or 10 mm crushed rock or crushed gravel conforming to MRTS22 *Supply of Cover Aggregate*. It shall be uniformly coated with bitumen emulsion. The quantity of bitumen emulsion incorporated in the aggregate shall be sufficient to prevent aggregate stripping from the patch but not so much as to cause a fatty surface.

The coated aggregate shall be projected by the air jet onto the prepared surface so that it forms a compacted interlocking mass.



If required to prevent pick-up by traffic, a single layer of dry stone shall be spread over the coated aggregate.

Loose stone shall be swept from the patched area and the adjoining pavement.

### Restoration Standards

The seal width shall be restored to within 30 mm of the original line of the seal edge.

The finished surface shall be within  $\pm 5$  mm of the height of and conform to the shape of the surrounding road surface.

The patch shall not exhibit stripping of aggregate or bleeding of bitumen.

No loose material shall be left on the sealed carriageway.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
112	Surface Correction with Emulsion / Aggregate – Minor (< 150 m / km)	m <sup>3</sup> (loose)

### Testing Requirements

Minimum Test Frequency	
<b>Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
<b>Horizontal Straightedge</b>	
Horizontal Straightedge Q712	2 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Blower type patching machine (including truck)

### **Materials**

Aggregate to MRTS22 *Supply of Cover Aggregate*

Emulsion to MRTS21 *Bituminous Emulsion*

TRPMs / paint

### **Manpower Requirements**

Leading hand 1

Labourer 1

Truck driver 1

Traffic controllers 2

### **Average Daily Production**

4 m<sup>3</sup> (loose aggregate)

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Determine whether a minor or major surface correction is more efficient.
  - Minor - up to approximately 10 m<sup>2</sup> isolated area, or
  - Major - more than approximately 10 m<sup>2</sup> in one area.
8. Note if line marking will be required. Schedule another Activity, and
9. Specify the appropriate plant, material and crew (including quantities of materials) and organise these. Ensure the surfacing material will give a texture as consistent as possible with the adjoining road.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - see Roadworks Signing Guide:
  - a. vehicle warning lights

- b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. should be marked out already.
3. Blow the area:
  - a. a clean dust free surface.
4. Tack coat the area with emulsion:
  - a. light, even coat
  - b. avoid pooling, and
  - c. allow emulsion to break.
5. Pneumatically place bitumen emulsion coated aggregate:
  - a. spread evenly.
6. Apply dry cover material, if specified by your supervisor.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
9. Re-establish line marking:
  - a. use TRPMs or spotting.
10. Remove traffic control:
  - a. clean / repair, as necessary.

### **113 Surface Correction – Major (> 150 m / km)**

#### **Description**

The application by machine (e.g. paver, flowcon) of premix or asphalt levelling course to distorted and rutted areas of the bituminous surface, or

The application of graded aggregate and emulsion using blower type compaction equipment to level distorted and rutted areas of the roadway bituminous surface. Includes surface preparation and tack coating.

#### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and material
- establishment and disestablishment of traffic control
- determination of the work area

- preparation of the existing surface, including the installation of offset points for the spotting of the centre and edge lines upon completion of the overlay
- for asphalt the supply and application of a bitumen emulsion tack coat – refer Applicable Specifications and the supply, placement and compaction of the asphalt
- for emulsion and aggregate the supply, application and compaction of the material – refer Applicable Specifications. All cracked or loose material shall be removed from the area to be repaired
- the area to be repaired shall be sprayed with a tack coat of bitumen emulsion and the tack coat shall extend slightly beyond the area to receive the coated aggregate
- the aggregate shall be an approved mix of 5 mm, 7 mm and/or 10 mm crushed rock or crushed gravel conforming to MRTS22 *Supply of Cover Aggregate*. It shall be uniformly coated with bitumen emulsion. The quantity of bitumen emulsion incorporated in the aggregate shall be sufficient to prevent aggregate stripping from the patch but not so much as to cause a fatty surface
- the coated aggregate shall be projected by the air jet onto the prepared surface so it forms a compacted interlocking mass
- if required to prevent pick-up by traffic, a single layer of dry stone shall be spread over the coated aggregate
- loose stones shall be swept from the patched area and the adjoining pavement
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>
SS	Premix Asphalt

### Restoration Standards

For Emulsion / Aggregate:

As per Applicable Specifications above.

The finished surface shall be within  $\pm 5$  mm of the height of and conform to the shape of the surrounding road surface.

Install TPRMs and/or spotting, if required.

The Contractor shall demonstrate compliance with the requirements of MRTS30 *Asphalt Pavements* with respect to rolling pattern requirements and temperature at time of rolling commencement.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

For Emulsion / Aggregate:

The seal width shall be restored to within 30 mm of the original line of the seal edge.

The finished surface shall be within  $\pm 5$  mm of the height of and conform to the shape of the surrounding road surface.

The patch shall not exhibit stripping of aggregate or bleeding of bitumen.

No loose material shall be left on the sealed carriageway.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

For Asphalt:

Item	Description	Units of Measurement
113	Surface Correction with Premix / Asphalt (Mechanical) – Major (> 150 m / km)	tonnes

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
	Establishment / disestablishment of paver and paving gang at paving site	Each
955810	Preparation of existing surface	m <sup>2</sup>
955820	Tack coat m <sup>2</sup>	Litres
955850	Dense graded asphalt pavement, 10 mm mix	tonnes
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
955070	Dense graded asphalt pavement, 20 mm mix	tonnes
	Cold-mixed asphalt pavement	tonnes

### Testing Requirements

<b>Minimum Test Frequency</b>	
<b>Asphalt / Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Temperature at Time of Rolling Commencement	6 / Lot
<b>Horizontal Straightedge</b>	
Horizontal Straightedge Q712	1 / 10 m
Maximum Lot Size	One day
<b>Asphalt /Premix Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

#### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Determine whether a manual or mechanical correction repair method is more efficient:
  - Manual - up to approximately 10 m<sup>2</sup> in isolated areas, or
  - Mechanical - more than approximately 10 m<sup>2</sup> in one area.
8. Note if road marking will be required. Schedule another Activity.
9. Consider subcontracting options.

10. Specify the appropriate plant, materials and crew (including quantities of material) and organise these, and
11. Schedule waterproofing (Activity Number 118) within four weeks if a cold laid premix is used and a reseal is not scheduled in that period.

For Emulsion / Aggregate:

Item	Description	Units of Measurement
113	Surface Correction with Emulsion / Aggregate – Major (> 150 m / km)	m <sup>3</sup> (loose)

### Testing Requirements

Minimum Test Frequency	
<b>Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
<b>Geometrics</b>	
Horizontal Straightedge Q712	2 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### WORK PREPARATION

#### Plant Requirements

Job truck

Blower type patching machine (including truck)

#### Materials

Aggregate to MRTS22 *Supply of Cover Aggregate*

Emulsion to MRTS21 *Bituminous Emulsion*

TRPMs / paint



### **Manpower Requirements**

Leading hand	1
Labourer	1
Truck driver	1
Traffic controllers	2

### **Average Daily Production**

4 m<sup>3</sup> (loose aggregate)

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Determine whether a minor or major surface correction is more efficient:
  - Minor - up to approximately 10 m<sup>2</sup> isolated area, or
  - Major - more than approximately 10 m<sup>2</sup> in one area.
8. Note if line marking will be required. Schedule another Activity, and
9. Specify the appropriate plant, material and crew (including quantities of materials) and organise these. Ensure the surfacing material will give a texture as consistent as possible with the adjoining road.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - see Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. should be marked out already.
3. Blow the area:
  - a. a clean dust free surface.

4. Tack coat the area with emulsion:
  - a. light, even coat
  - b. avoid pooling, and
  - c. allow emulsion to break.
5. Pneumatically place bitumen emulsion coated aggregate:
  - a. spread evenly.
6. Apply dry cover material, if specified by your supervisor.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
9. Re-establish line marking:
  - a. use TRPMs or spotting.
10. Remove traffic control:
  - a. clean / repair, as necessary.

#### **114 Surface Enrichment – Major (≥ 150 m / km)**

##### **Description**

A light application of bituminous material, with or without fine aggregate cover, to increase the binder content of a bituminous surfacing.

##### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

##### **Restoration Standards**

As per Applicable Specifications above.

Dimensions to be not less than, nor exceed by 150 mm, the length and width specified.

To present a uniform appearance.

No loose material shall be left on the sealed carriageway.

Install TRPMs and/or spotting, if required.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
114	Surface Enrichment – Major ( $\geq 150$ m / km)	m <sup>2</sup>

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
956500	Enrichment (class, rate, m <sup>2</sup> )	Litres
956600	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (bitumen emulsion) (type)	tonnes
956920	Supply of material (bitumen cutter)	tonnes

**Testing Requirements**

Minimum Test Frequency	
Bitumen - Sample Q080	1 / Tank
Application Rates - Spraying Records	
Maximum Lot Size	One day

If cover aggregate is used, testing requirements shall be as detailed for cover aggregate under Activity Number 161.

**WORK PREPARATION****Plant Requirements**

Job truck

Bitumen sprayer

Front end loader

Multi-tyred roller

Rotary broom

Drag broom

Trucks with spreaders for cover, if required

**Materials**

Precoated screenings to MRTS22 *Supply of Cover Aggregate*

Bitumen to MRTS17 *Bitumen and Multigrade Bitumen*

Bitumen emulsion to MRTS21 *Bituminous Emulsion*

Cutter to MRTS19 *Cutter Oils*

Additive

TRPMs / paint

Sealing signs "Loose Stones" and "Avoid Windscreen Damage Drive Slowly"

### **Manpower Requirements**

Leading hand 1

Labourers 2

Plant operators 4

Truck drivers

Traffic controllers 2

### **Average Daily Production**

< 3000 L Sprayer 5000 m<sup>2</sup>

> 3000 L Sprayer 9000 m<sup>2</sup>

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Check the area for surface defects. All defects (except minor cracking and chip loss) should be repaired before the enrichment.
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for enrichment.
6. Obtain Engineer's advice on the appropriate treatment, binder and additives. Specify these.
7. Calculate spray rate.
8. Specify the appropriate plant, material and crew (including quantities of materials) and organise these.
9. Note if road marking will be required. Schedule another Activity.
10. Register line marking reference points at the sides and end of work area, if necessary, and
11. Check for overhead wires that could catch tip trucks.

## **WORK PROCEDURES**

### **Sequential Steps and Checkpoints**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area.
3. Cover adjacent concrete surfaces.

4. Inspect the pavement:
  - a. ensure all defects are repaired
  - b. specify cutter content, and
  - c. preparatory work completed.
5. Remove all loose material:
  - a. sweep with hard or rotary broom.
6. Check plant condition, crew and material availability:
  - a. whole operation must be ready before starting.
7. Spray binder:
  - a. check and record temperatures
  - b. correct amount of cutter and additives, and
  - c. spray evenly at specified rate.
8. Apply cover material:
  - a. use spreaders at specified rate.
9. Check the work against Restoration Standards.
10. Re-establish line marking:
  - a. use TRPMs and tape.
11. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains, and
  - c. notify supervisor if line marking required.
12. Remove traffic control:
  - a. use sealing signs, if needed, and
  - b. clean / repair, as necessary.
13. Complete the spray sheets.

#### **115 Surface Enrichment – Minor ( $\leq 150$ m / km)**

##### **Description**

A light application of bituminous material, with or without fine aggregate cover, to increase the binder content of a bituminous surfacing.

##### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>

Reference	Title
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

### Restoration Standards

As per Applicable Specifications above.

Dimensions to be not less than, nor exceed by 150 mm, the length and width specified.

To present a uniform appearance.

No loose material shall be left on the sealed carriageway.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
115	Surface Enrichment – Minor ( $\leq 150$ m / km)	m <sup>2</sup>

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
956500	Enrichment (class, rate, m <sup>2</sup> )	Litres
956600	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (bitumen emulsion) (type)	tonnes
956920	Supply of material (bitumen cutter)	tonnes

### Testing Requirements

Minimum Test Frequency	
Bitumen - Sample Q080	1 / Tank
Application Rates - Spraying Records	
Maximum Lot Size	One day

If cover aggregate is used, testing requirements shall be as detailed for cover aggregate under Activity Number 161.

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Bitumen sprayer

Front end loader

Multi-tyred roller

Rotary broom

Drag broom

Trucks with spreaders for cover, if required

### **Materials**

Precoated screenings to MRTS22 *Supply of Cover Aggregate*

Bitumen to MRTS17 *Bitumen and Multigrade Bitumen*

Bitumen emulsion to MRTS21 *Bituminous Emulsion*

Cutter to MRTS19 *Cutter Oils*

Additive

TRPMs / paint

Sealing signs "Loose Stones" and "Avoid Windscreen Damage Drive Slowly"

### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Plant operators                4

Truck drivers

Traffic controllers            2

### **Average Daily Production**

< 3000 L Sprayer 5000 m<sup>2</sup>

> 3000 L Sprayer 9000 m<sup>2</sup>

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Check the area for surface defects. All defects (except minor cracking and chip loss) should be repaired before the enrichment.
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for enrichment.



6. Obtain Engineer's advice on the appropriate treatment, binder and additives. Specify these.
7. Calculate spray rate.
8. Specify the appropriate plant, material and crew (including quantities of materials) and organise these.
9. Note if road marking will be required. Schedule another Activity.
10. Register line marking reference points at the sides and end of work area, if necessary, and
11. Check for overhead wires that could catch tip trucks.

## **WORK PROCEDURES**

### **Sequential Steps and Checkpoints**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area.
3. Cover adjacent concrete surfaces.
4. Inspect the pavement:
  - a. ensure all defects are repaired
  - b. specify cutter content, and
  - c. preparatory work completed.
5. Remove all loose material:
  - a. sweep with hard or rotary broom.
6. Check plant condition, crew and material availability:
  - a. whole operation must be ready before starting.
7. Spray binder:
  - a. check and record temperatures
  - b. correct amount of cutter and additives, and
  - c. spray evenly at specified rate.
8. Apply cover material:
  - a. use spreaders at specified rate.
9. Check the work against Restoration Standards.
10. Re-establish line marking:
  - a. use TRPMs and tape.

11. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains, and
  - c. notify supervisor if line marking required.
12. Remove traffic control:
  - a. use sealing signs, if needed, and
  - b. clean / repair, as necessary.
13. Complete the spray sheets.

#### **117 Reseal – Major ( $\geq 150$ m / km)**

##### **Description**

The treatment of short sections of the existing roadway surface using certified sprayer and plant, bitumen and precoated screenings to restore seal life and/or skid resistance.

##### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- preparation of the existing surface, including the installation of offset points for the spotting of the centre and edge lines upon completion of the reseal works
- preparation of a suitable seal design
- the supply, carting, heating and spraying of a bitumen seal coat (including cutter and additive) at the design rate
- the supply, carting, spreading and rolling etc of a precoated aggregate at the design rate
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications table for this Activity (e.g. sweeping, incorporation of cutter and additive etc)
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

##### **Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

### Restoration Standards

Dimensions to be not less than, nor exceed by 150 mm, the length and width specified.

To present a uniform appearance with close stone contact.

No loose material shall be left on the sealed carriageway.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
117	Reseal – Major ( $\geq 150$ m / km)	m <sup>2</sup>

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
956400	Reseal (class, rate, m <sup>2</sup> )	Litres
956600	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m <sup>3</sup>
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m <sup>3</sup>
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (modified bitumen Class 170 + 3% SBS polymer)	tonnes
956920	Supply of material (bitumen cutter)	tonnes
956930	Supply of material (adhesion agent)	Kilograms

### Testing Requirements

Minimum Test Frequency	
Cover Aggregate	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year

<b>Minimum Test Frequency</b>	
<b>Cover Aggregate</b>	
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
Bitumen – Sample Q080	1 / Tank
<b>Application Rates – Spraying Records</b>	
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

#### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Check the area for surface defects. All defects (except minor cracking and chip loss) should be repaired before the seal coat.
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for sealing. Ensure the area overlaps any repairs by 50 – 100 mm.
6. Obtain Engineer's advice on the appropriate treatment, binder and additives. Specify these.
7. Calculate spray rate.
8. Specify the appropriate plant, material and crew (including quantities of materials) and organise these. Screenings must be coated at least four days in advance of Activity. Ensure the screenings will give a texture consistent with surrounding road.
9. Arrange for testing materials.
10. Note if road marking will be required. Schedule another Activity.
11. Register line marking reference points at the sides and end of work area, if necessary, and
12. Check for overhead wires that could catch tip trucks.

**118 Seal Coating – Minor (< 150 m / km)****Description**

The treatment of short sections of road surface (either sealed or unsealed) using small non-certified plant, to seal the surface and restore surface life and/or skid resistance. The Activity may be used to seal small sections of new work.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- protection of service facilities (e.g. manhole covers etc)
- all work items as detailed in MRTS12 *Sprayed Bituminous Emulsion Surfacing* and MRTS22 *Supply of Cover Aggregate*
- preparation of a seal design
- the supply and application of a bitumen emulsion at a rate as per design
- the precoating, spreading and rolling of cover aggregate (including the supply of all materials) at the designed spread rate
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

**Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

### Restoration Standards

Dimensions to be not less than nor exceed by 150 mm the length and width specified.

To present a uniform appearance with close stone contact.

No loose material shall be left on the sealed carriageway.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
118	Seal Coating – Minor (< 150 m / km)	m <sup>2</sup>

### Testing Requirements

Minimum Test Frequency	
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
<b>Bitumen</b>	
Bitumen – Sample Q080	1 / Tank

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Check the area for surface defects. All defects (except minor cracking and chip loss) should be repaired before the seal coat.
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for sealing. Ensure the area overlaps any repairs by 50 – 100 mm.
6. Obtain Engineer's advice on the appropriate treatment, binder and additives. Specify these.
7. Calculate spray rate.

8. Specify the appropriate plant, material and crew (including quantities of materials) and organise these. Screenings must be coated at least four days in advance of Activity. Ensure the screenings will give a texture consistent with surrounding road.
9. Arrange for testing materials.
10. Note if road marking will be required. Schedule another Activity.
11. Register line marking reference points at the sides and end of work area, if necessary, and
12. Check for overhead wires that could catch tip trucks.

### 119 Surface Correction (Skid Resistance)

#### Description

The treatment of short sections of sealed road surface using small non-certified plant, to correct the seal and restore skid resistance. The Activity may be used to seal small sections identified as accident blackspots.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

#### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- protection of service facilities (e.g. manhole covers etc)
- all work items as detailed in MRTS12 *Sprayed Bituminous Emulsion Surfacing* and MRTS22 *Supply of Cover Aggregate*
- preparation of a seal design, including allowances for specialised anti-skid applications
- the supply and application of an anti- skid adhesive surfacing at a rate as per design
- the precoating, spreading and rolling of cover aggregate (including the supply of all materials) at the designed spread rate
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

### Restoration Standards

Dimensions to be not less than nor exceed by 150 mm the length and width specified.

To present a uniform appearance with close stone contact.

No loose material shall be left on the sealed carriageway.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
119	Surface Correction (Skid Resistance)	m <sup>2</sup>

### Testing Requirements

Minimum Test Frequency	
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
<b>Bitumen</b>	
Bitumen – Sample Q080	1 / Tank

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities



may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Check the area for surface defects. All defects (except minor cracking and chip loss) should be repaired before the seal coat.
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for sealing. Ensure the area overlaps any repairs by 50 – 100 mm.
6. Obtain Engineer's advice on the appropriate treatment, binder and additives. Specify these.
7. Calculate spray rate.
8. Specify the appropriate plant, material and crew (including quantities of materials) and organise these. Screenings must be coated at least four days in advance of Activity. Ensure the screenings will give a texture consistent with surrounding road.
9. Arrange for testing materials.
10. Note if road marking will be required. Schedule another Activity.
11. Register line marking reference points at the sides and end of work area, if necessary, and
12. Check for overhead wires that could catch tip trucks.

## 120 Fill Cracks

### Description

The cleaning and filling of cracks typically not wider than 20 mm in bituminous pavements with polymer-modified bitumen products.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

All loose material shall be removed from the crack.

The crack sealant shall be a Polymer-modified bituminous sealant approved by the Principal.

The sealant shall be applied with an approved applicator which places a band of sealant over the crack and fills the crack.

### Restoration Standards

The crack shall be filled along its full length.

The finished surface shall be not lower than the surrounding road surface nor more than 5 mm above it.

Install TRPMs and/or spotting, if required.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
120	Fill Cracks	Litres

**Testing Requirements**

Minimum Test Frequency	
Horizontal Straightedge Q712	1 / 10 m

**WORK PREPARATION****Plant Requirements**

Job truck

Compressor (with air nozzle)

Sealant applicator

Bitumen kettle

**Materials**

Dry filler material

Approved polymer modified bituminous sealant

Dry cover material

**Manpower Requirements**

Leading hand 1

Labourers 2

Traffic controllers 2

**Average Daily Production**

200 L - when dry filler material is not used

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair.
6. Note if road marking will be required. Schedule another Activity, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. this may be marked out already.
3. Remove all loose material from the marked area:
  - a. sweep surface and crack with hard broom, and
  - b. blow out loose material in the crack with compressed air or prise out with a knife.
4. Partly fill cracks:
  - a. use dry filler material, if specified by your supervisor
  - b. fill to 25 mm from road surface, and
  - c. clean any excess from the surface.
5. Apply crack sealant:
  - a. follow the manufacturer's instructions
  - b. use safety equipment and clothing, and
  - c. check HAZCEM code.
6. Apply cover material:
  - a. dry cover material, and
  - b. sealant is lightly and evenly covered.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains, and
  - c. notify supervisor if line marking required.
9. Remove traffic control:
  - a. clean / repair, as necessary.

**121 Crack Treatment with Emulsion / Aggregate****Description**

The cleaning and filling of cracks in bituminous pavements with graded aggregate and emulsion using blower type compaction equipment.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

All loose material shall be removed from the cracks to be filled.

The sides of the cracks shall be sprayed with a tack coat of bitumen emulsion and the tack coat shall overlap slightly the adjoining seal.

The aggregate shall be an approved mix of 5 mm, 7 mm and/or 10 mm crushed rock or crushed gravel conforming to MRTS22 *Supply of Cover Aggregate*. It shall be uniformly coated with bitumen emulsion. The quantity of bitumen emulsion incorporated in the aggregate shall be sufficient to prevent aggregate stripping from the patch but not so much as to cause a fatty surface.

The coated aggregate shall be projected by the air jet into the crack so that it forms a compacted interlocking mass.

If required to prevent pick-up by traffic, a single layer of dry stone shall be spread over the coated aggregate.

Loose stone shall be swept from the treated area and the adjoining pavement.

**Restoration Standards**

The crack shall be filled along its entire length.

The finished surface shall be within  $\pm 5$  mm of the height of the surrounding road surface.

The treated area shall not exhibit stripping of aggregate or bleeding of bitumen.

No loose material shall be left on the sealed carriageway.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
121	Crack Treatment with Emulsion / Aggregate	m <sup>3</sup>

**Testing Requirements**

Minimum Test Frequency	
Aggregate	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year

<b>Minimum Test Frequency</b>	
<b>Aggregate</b>	
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
Maximum Lot Size	One day
<b>Geometrics</b>	
Horizontal Straightedge Q712	2 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. should be marked out already.
3. Remove all loose material from area to be treated.
  - a. blow out loose material.
4. Tack coat the area with bitumen emulsion:
  - a. light, even coat, and
  - b. allow emulsion to break.
5. Pneumatically place bitumen emulsion coated aggregate.
6. Apply dry cover material, if specified by your supervisor.
7. Check the work against the Restoration Standards.

8. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
9. Re-establish line marking:
  - a. use TRPMs or spotting.
10. Remove traffic control:
  - a. clean / repair, as necessary.

#### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Is an alternative remedy or major maintenance more appropriate?
4. Mark out the area for treatment.
5. Note if line marking will be required. Schedule another Activity, and
6. Specify the appropriate plant, material and crew (including quantities of materials) and organise these.

### 122 Crack Treatment with Strain Alleviating Product

#### Description

The application of a polymer-modified bitumen strain alleviating product to an existing bituminous surface to treat cracking.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS22	<i>Supply of Cover Aggregate</i>

#### Restoration Standards

As per Applicable Specifications above.

Dimensions to be not less than, nor exceed by 150 mm, the length and width specified.

Install TRPMs and/or spotting, if required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
122	Crack Treatment with Strain Alleviating Product	m <sup>2</sup>

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
912100	Provision for traffic	Dollars
956400	Reseal (class, rate, m <sup>2</sup> )	m <sup>2</sup>
956600	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m <sup>3</sup>

**Testing Requirements**

Minimum Test Frequency	
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
<b>Bitumen</b>	
Polymer-Modified Bitumen - Sample Q080	1 / Tank
Application Rates - Spraying Records	

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

**WORK PREPARATION****Plant Requirements**

Job truck

Bitumen sprayer

Front end loader

Multi-tyred roller

Rotary broom

Drag broom

Trucks with spreaders for cover, if required

### **Materials**

Cover aggregate to MRTS22 *Supply of Cover Aggregate*

Bitumen to MRTS17 *Bitumen and Multigrade Bitumen*

Cutter to MRTS19 *Cutter Oils*

Additive

TRPMs / paint

Sealing signs "Loose Stones" and "Avoid Windscreen Damage Drive Slowly"

### **Manpower Requirements**

Leading hand 1

Labourers 2

Plant operators 4

Truck drivers

Traffic controllers 2

### **Average Daily Production**

< 3000 L sprayer 5000 m<sup>2</sup>

> 3000 L sprayer 9000 m<sup>2</sup>

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Check the area for surface defects. All defects (except minor cracking and chip loss) should be repaired before applying the strain alleviating product.
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for treatment.
6. Obtain Engineer's advice on the appropriate treatment, binder and additives. Specify these.
7. Calculate spray rate.
8. Specify the appropriate plant, material and crew (including quantities of materials) and organise these.
9. Note if road marking will be required. Schedule another Activity.
10. Register line marking reference points at the sides and end of work area, if necessary, and
11. Check for overhead wires that could catch tip trucks.



## WORK PROCEDURES

### Sequential Steps and Checkpoints

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area.
3. Cover any adjacent concrete surfaces.
4. Inspect the pavement:
  - a. ensure all defects are repaired
  - b. specify cutter content, and
  - c. preparatory work completed.
5. Remove all loose material:
  - a. sweep with hard or rotary broom.
6. Check plant condition, crew and material availability:
  - a. whole operation must be ready before starting.
7. Spray binder:
  - a. check and record temperatures
  - b. correct amount of cutter and additives, and
  - c. spray evenly at specified rate.
8. Apply cover material:
  - a. use spreaders at specified rate.
9. Check the work against Restoration Standards.
10. Re-establish line marking:
  - a. use TRPMs and tape.
11. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains, and
  - c. notify supervisor if line marking required.
12. Remove traffic control:
  - a. use sealing signs, if needed, and
  - b. clean / repair, as necessary.
13. Complete the spray sheets.

## 123 Surface Strip Treatment of Cracks

### Description

The sealing of cracks (up to a width of 5 mm) in bituminous pavements with a surface strip treatment, such as:

- stick on proprietary strips (polymer bitumen and/or geotextile based), or
- proprietary grids.

### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the supply and application of the strip treatment material as per the manufacturer's specification
- the supply and installation of TRPMs or line spotting, as required
- the supply and application of a light cover material, if required (i.e. if there is a risk of the traffic picking up the strip on contact with tyres)
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

All loose material shall be removed from the crack.

The crack sealant shall be an approved stick-on proprietary strip (either polymer bitumen and/or geotextile based), or an approved proprietary grid.

The proprietary products shall be applied in accordance with the manufacturer's instructions.

### Restoration Standards

The crack shall be filled along its full length.

The finished surface shall be not lower than the surrounding road surface nor more than 5 mm above it.

Install TPRMs and/or spotting, if required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
123	Surface Strip Treatment of Cracks	Metres

#### Testing Requirements

Minimum Test Frequency	
Straightedge Q712	1 / 10 m

#### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction works is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair.
6. Note if road marking will be required. Schedule another Activity, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

### 124 Concrete Joint and Crack Treatment

#### Description

The routing, cleaning and filling of joints and cracks in concrete pavements to prevent infiltration of moisture into the underlying pavement structure.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS40	<i>Concrete Pavement Base</i>

Where specified in the Work Order, the joint shall be routed and the side walls liquid / air blasted, as specified in MRTS40 *Concrete Pavement Base* and/or shown on the Work Order.

All loose material shall be removed from the joint.

Polyethylene backer rods or PVC spline seals shall be replaced or provided when shown on the Work Order.

The crack sealant shall be an approved silicone sealant or an approved SBS polymer-modified bitumen sealant as shown on the Work Order.

The joint shall be sealed, as specified in MRTS40 *Concrete Pavement Base* and/or shown on the Work Order.

### Restoration Standards

The joint shall be filled along its full length.

The height and depth of sealant shall be as shown on the Work Order.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
124	Concrete Joint and Crack Treatment	Metres

### Testing Requirements

Minimum Test Frequency	
Straightedge Q712	1 / 10 m

## WORK PREPARATION

### Plant Requirements

Job truck

Compressor / pump (with air / liquid nozzle)

Sealant applicator

### Materials

Dry filler material

Polyethylene backer rods or PVC spline seals

Sealant

Dry cover material

### Manpower Requirements

Leading hand 1

Labourers 2

Traffic controllers 2

### Average Daily Production

Not detailed.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?

5. Mark out the area for repair.
6. Note if road marking will be required. Schedule another Activity, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. this may be marked out already.
3. Where required, rout out joint or crack.
4. Remove all loose material from the marked area:
  - a. sweep surface and crack with hard broom
  - b. blow out loose material in the crack with compressed air, and
  - c. prise out material wedged in joint or crack.
5. Install silicone sealant (if specified):
  - a. clean joint walls
  - b. use liquid / air jet
  - c. install backer rod or spline to correct depth
  - d. blow out joint with dry air
  - e. apply sealant
  - f. follow the manufacturer's instructions
  - g. use safety equipment and clothing, and
  - h. check HAZCEM code.
6. Install SBS Polymer-modified bitumen sealant (if specified):
  - a. partly fill cracks
  - b. use dry filler material, if specified by your supervisor
  - c. fill to 25 mm from road surface
  - d. clean any excess from the surface
  - e. apply crack sealant

- f. follow the manufacturer's instructions
  - g. use safety equipment and clothing
  - h. check HAZCEM code
  - i. apply dry cover material, and
  - j. sealant lightly and evenly covered.
7. Check the work against the Restoration Standards.
  8. Leave work site safe and tidy:
    - a. remove all loose material
    - b. no material to block drains, and
    - c. notify supervisor if line marking required.
  9. Remove traffic control:
    - a. clean / repair, as necessary.

## 125      **Stitch Treat Cracks in Concrete Roads**

### **Description**

The stitching of cracks in concrete roadway surface using staple or cross-stitched tie bars. Includes provision of cleaned out chase out slots and/or holes, appropriate resin or other mortar and a sealed crack groove.

### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>

### **Restoration Standards**

The concrete pavement repaired to the standards specified in the approved repair method.

### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
125	Stitch Treat Cracks in Concrete Roads	Metres

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Compressor

### **Materials**

Reinforcing bars

Cementing agent and other mortar components

### **Manpower Requirements**

Leading hand	1
Labourers	2
Operator	1
Traffic controllers	2

### **Average Daily Production**

Not detailed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the cracks requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine cracks to be repaired:
  - a. from supervisor's instructions.
3. Install the stitch treatment:
  - a. in accordance with details in Work Order
  - b. cross stitch, drill holes at angle to concrete surface
  - c. staple tie, cut chase and drill holes
  - d. insert reinforcing bars
  - e. mix and insert mortar, and
  - f. check HAZCEM code.

4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

## 126 Replacement of Concrete Joint Sealant

### Description

The removal of existing joint sealant, cleaning of joint and replacement.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

### Restoration Standards

The concrete pavement repaired to the standards specified in the approved repair method.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
126	Replacement of Concrete Joint Sealant	Metres

## WORK PREPARATION

### Plant Requirements

Job truck

Compressor

Materials

Joint sealant

### Manpower Requirements

Leading hand 1

Labourers 1

Operator 1

Traffic controllers 2

### Average Daily Production

Not detailed.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.



2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the joints requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine joints to be repaired:
  - a. from supervisor's instructions.
3. Remove existing sealant:
  - a. clean and prepare surface
  - b. apply new sealant to manufacturer's specification
  - c. ensure adequate drying time is allowed, and
  - d. check HAZCEM code.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

## **127 Concrete Pothole Patching**

### **Description**

The repair with asphalt of an isolated hole or series of holes in the concrete roadway surface that is in otherwise sound condition.

**Note**

The repair of potholes in other than sound pavement (i.e. there is a presence of other defects such as cracking, lifting etc) should be carried out under a different Activity (e.g. Activity Numbers 126, 129 etc), depending on the situation and the appropriate response time required. In deciding the most appropriate Activity to use, consideration should be given to any impending construction / rehabilitation that may be programmed for the area. This will help to achieve the most efficient choice of the maintenance Activity required.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the removal of any cracked or loose material from the area to be repaired
- the formation of a vertical face on the hole edges. The edges of the hole are to be cleaned and shaped in the form of a rectangle
- the supply and application of a bitumen emulsion tack coat – refer to Applicable Specifications
- the supply, placement and compaction of the asphalt.
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	Premix Asphalt

**Restoration Standards**

The finished surface shall be within  $\pm 5$  mm of the height of and conform to the shape of the surrounding road surface.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

No loose material shall be left on sealed carriageway.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
127	Concrete Pothole Patching	tonnes

#### Testing Requirements

Minimum Test Frequency	
Asphalt / Premix	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Geometrics	
Horizontal Straightedge Q712	2 / Lot minimum
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

#### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, either:
  - a. schedule another Activity to repair it, or
  - b. extend the area of the pothole repair to include it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Mark out the area for repair.
7. Remember when scheduling the work that potholes in the wheel path deteriorate rapidly, and
8. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

**128 Jacking of Concrete Slab****Description**

The lifting of sunken concrete slabs to realign with adjacent road surface.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Restoration Standards**

The concrete pavement repaired to the standards specified in the approved repair method.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
128	Jacking of Concrete Slab	Metres

**WORK PREPARATION****Plant Requirements**

Job truck

Compressor

**Materials**

Joint sealant

**Manpower Requirements**

Leading hand 1

Labourers 2

Operator 1

Traffic controllers 2

**Average Daily Production**

Not detailed.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the joints requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and

7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine slabs to be jacked:
  - a. from supervisor's instructions.
3. Jack existing slab:
  - a. drill through slab, and
  - b. inject mortar / limestone mix.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### **129 Pavement Repairs, Concrete (Mechanical) – Minor (< 500 m<sup>2</sup> / km)**

#### **Description**

The repair by machine of concrete surfacing of size less than 500 m<sup>2</sup> by removal of the deteriorated pavement and concrete asphalt surface and replacement with new pavement material and asphalt or concrete seal treatment to profile. May include treatment of subgrade materials and reworking, as appropriate.

Child Activities are to be used for depths of treatment as follows:

- 129 10 depth up to 200 mm
- 129 20 depth up to 300 mm, and
- 129 30 depth over 300 mm.

#### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control

- determination of the work area and confirmation of the pavement design
- excavation of the failed area to the approved pavement design depth, including the removal of any loose material from the area to be repaired. Where a road profiler is used only areas inaccessible by the profiler drum (i.e. generally at corners of the repair) will be accepted at a lesser depth than that approved. In these areas, a minimum depth shall be specified
- where applicable, compaction of the excavated surface (where the surface has been loosened)
- preparation of the existing surface, including brooming
- the formation of a vertical face to a minimum depth equal to the pavement design (measured from the top of the excavation) for the full length of the excavated edges. Where a road profiler is used, a nominated reduced depth of vertical face will be accepted in areas where the shape of the profiler's drum does not allow the design depth to be achieved. The repairs shall be rectangular in shape
- the supply, placement and compaction of pavement material, cement treated, if appropriate
- the supply and application of a bitumen emulsion tack coat, if applicable, as per Applicable Specifications
- the supply, placement and compaction of the asphalt or concrete, as appropriate
- the supply and installation of TRPMs or line spotting, as required
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS21	<i>Bituminous Emulsion</i>

Reference	Title
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>
MRTS39	<i>Lean Mix Concrete Sub-base for Pavements</i>
MRTS40	<i>Concrete Pavement Base</i>
MRTS70	<i>Concrete</i>
MRTS71	<i>Reinforcing Steel</i>

Concrete / Asphalt Pavements:

The design of the repaired pavement shall conform to the pavement design standards of Department of Transport and Main Roads.

Geotextiles on / under subgrade shall comply with the requirements specified for geotextiles under / within embankments in MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*.

The unbound pavement material shall be of a quality at least equal to that used in sound sections of the road adjacent to the repairs.

Plant-mix stabilised pavement shall be unbound pavement, as specified above, stabilised with not less than 2% by mass of cement.

Concrete shall be placed in accordance with MRS70 *Concrete*.

The Principal may direct that a paver be employed to place plant-mix stabilised and/or dense graded asphalt pavement material or may approve the use of other equipment for this purpose. Such other equipment shall not cause the mix to segregate.

All excavated material shall be disposed of or stored in a neat and tidy manner away from the road formation and drainage lines. Material suitable for reuse shall be stored at nominated stockpile sites, unless otherwise agreed.

### **Restoration Standards**

The finished work shall meet the requirements of the relevant specifications, except as provided hereunder.

The finished surface shall conform to the shape of the surrounding road surface.

Install TRPMs and/or spotting, if required.

The deviation from a 3 m straightedge placed along the wheel paths shall be no more than + 8 mm, - 5 mm due allowance being made for design shape, where relevant.

The Contractor shall demonstrate compliance with the requirements of MRTS30 *Asphalt Pavements* with respect to rolling pattern requirements and asphalt temperature at time of rolling commencement. The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
129	Pavement Repairs, Concrete (Mechanical) – Minor (< 500 m <sup>2</sup> / km)	m <sup>2</sup>

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. cracking?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair. On large areas, use a cone penetrometer to determine depth of excavation required. Specify this depth. Consider using a geotextile.
6. Note if road marking will be required. Schedule another Activity.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
8. Arrange for testing materials.
9. Arrange and specify a disposal area for excavated material, and
10. Specify spray seal or asphalt surface. Specify asphalt depth.

**130 Surface Sweeping****Description**

The removal and disposal (in accordance with current statutory requirements) of all loose material < 1 m<sup>2</sup> in size (e.g. the build up of gravel / screenings at intersections, broken glass and similar) accumulated on the road surface, by hand or mechanical sweeping. The removal of larger types of material (e.g. tyre pieces, wood etc which have an area greater than 1 m<sup>2</sup>) will generally be undertaken using an alternative Activity (e.g. Activity Numbers 421, 429 or 452 if an emergency situation exists etc).

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and material
- establishment and disestablishment of traffic control
- determination of the work area
- the removal of material from the area - refer to Applicable Specifications below
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and



- the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

All loose material shall be removed from the sealed carriageway and disposed of in a neat and tidy manner away from the road formation and drainage lines.

### Restoration Standards

All loose material shall be removed from the sealed carriageway and shoulders.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
130	Surface Sweeping (Unit Rate)	m <sup>2</sup>

### Testing Requirements

None listed.

### Particular Planning Points to Consider

- What has caused the defect? Schedule another Activity to correct this, if needed.
- Specify the appropriate plant and crew and organise these, and
- Check for litter and arrange for collection prior to sweeping, if appropriate.

### 131 Surface Sweeping

Item	Description	Units of Measurement
131	Surface Sweeping (Fixed Price)	m <sup>2</sup>

Details to be advised.

### 135 Surface Debris Removal

#### Description

The removal from the roadway surface of foreign debris that may cause a safety hazard to the road user.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

All foreign debris shall be removed from the sealed carriageway and disposed of in a neat and tidy manner away from the road formation and drainage lines.

#### Restoration Standards

All foreign debris shall be removed from the sealed carriageway and shoulders.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
135	Surface Debris Removal	Dollars

**Testing Requirements**

Nil.

**WORK PREPARATION****Plant Requirements**

Rotary or suction broom

Pilot vehicle (maintenance patrol truck or utility)

Electronic variable message sign (if available)

Loader

**Materials**

Nil.

**Manpower Requirements**

Operators

Drivers 1

Labourers 2

Traffic controllers 2

**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed, and
2. Specify the appropriate plant and crew and organise these.

**WORK PROCEDURES****Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. this may be marked out already.

3. Remove larger debris by hand or loader:
  - a. debris that would not be removed by the sweeper or may damage it.
4. Remove smaller debris by sweeping the marked area:
  - a. a clean dust-free surface.
5. Check the work against the Restoration Standards.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### **137 Rut Correction – Minor (< 100 m / km)**

#### **Description**

Minor rut correction on rutted pavement or asphalt surfacing by removal of deteriorated pavement and/or asphalt and replacement with new pavement material and asphalt or an appropriate seal to profile. May include treatment of subgrade materials and re-working, as appropriate.

#### **Note**

For road sections not programmed for imminent permanent type works, individual repairs shall only be used where rapid deterioration of the pavement has not allowed sufficient time to schedule permanent repairs and shall only be performed once before permanent repairs are made. Includes the application of a bituminous emulsion seal coat and cover aggregate over the trimmed areas.

#### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the trimming of the rut or shove
- the compaction of the exposed roadway surface prior to applying the tack coat
- all work items as detailed in MRS12 *Sprayed Bituminous Emulsion Surfacing* and MRS22 *Supply of Cover Aggregate*
- the supply and application of a bitumen emulsion as per Applicable Specifications
- the precoating, spreading and rolling of cover aggregate (including the supply of all materials)
- the supply and installation of TRPMs or line spotting, as required
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any excavated / waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

All excavated material shall be disposed of or stored in a neat and tidy manner away from the road formation and drainage lines. Material suitable for reuse shall be stored at nominated stockpile sites, unless otherwise agreed.

#### Restoration Standards

The finished work shall meet the requirements of the relevant specifications, except as provided hereunder.

The finished surface shall be within  $\pm 10$  mm of the surrounding surface. The deviation from a 3 m straightedge placed along the wheel paths shall be no more than  $\pm 10$  mm due allowance being made for design shape, where relevant.

Install TRPMs and/or spotting, if required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
137	Rut Correction – Minor ( $< 100$ m / km)	m <sup>2</sup>

No other details are included in the Maintenance Activity Standard for this Activity.

#### 138 Rut Correction – Major ( $\geq 100$ m / km)

##### Description

Major rut correction on the rutted pavement or asphalt surfacing by removal of deteriorated pavement and/or asphalt and replacement with new pavement material and asphalt or an appropriate seal to profile. May include treatment of subgrade materials and re-working, as appropriate.

**Note**

For road sections not programmed for imminent permanent type works, individual repairs shall only be used where rapid deterioration of the pavement has not allowed sufficient time to schedule permanent repairs and shall only be performed once before permanent repairs are made. Includes the application of a bituminous emulsion seal coat and cover aggregate over the trimmed areas.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the trimming of the rut or shove
- the compaction of the exposed roadway surface prior to applying the tack coat
- all work items as detailed in MRS12 *Concrete* and MRS22 *Supply of Cover Aggregate*
- the supply and application of a bitumen emulsion as per Applicable Specifications
- the precoating, spreading and rolling of cover aggregate (including the supply of all materials)
- the supply and installation of TRPMs or line spotting, as required
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any excavated / waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

**Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

All excavated material shall be disposed of or stored in a neat and tidy manner away from the road formation and drainage lines. Material suitable for reuse shall be stored at nominated stockpile sites, unless otherwise agreed.

### Restoration Standards

The finished work shall meet the requirements of the relevant specifications, except as provided hereunder.

The finished surface shall be within  $\pm 10$  mm of the surrounding surface. The deviation from a 3 m straightedge placed along the wheel paths shall be no more than  $\pm 10$  mm due allowance being made for design shape, where relevant.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
138	Rut Correction – Major ( $\geq 100$ m / km)	m <sup>2</sup>

No other details are included in the Maintenance Activity Standard for this Activity.

### 139 Other Bituminous Surface Work

#### Description

The work carried out on the bituminous roadway surface not covered by Activity Numbers 101, 102, 103, 105, 106, 107, 110, 111, 112, 115, 117, 118, 120, 121, 122, 123, 130, 135, 137, 138, 146, 157 and 161.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
139	Other Bituminous Surface Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### 140 Pavement Repairs (Manual)

#### Description

The repair by hand of shoving pavement or asphalt surfacing (less than 1 m<sup>2</sup> in area) by removal of deteriorated pavement and/or asphalt and replacement with new pavement material and asphalt or an appropriate seal to profile. May include treatment of subgrade materials and re-working, as appropriate.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>

Reference	Title
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

Geotextiles on / under subgrade shall comply with the requirements specified for geotextiles under / within embankments in MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*.

The unbound pavement material shall be of a quality at least equal to that used in sound sections of the road adjacent to the repairs.

The plant-mix stabilised pavement shall be unbound pavement, as specified above, stabilised with not less than 2% by mass of cement.

All excavated material shall be disposed of in a neat and tidy manner away from the road formation and drainage lines.

#### Restoration Standards

The finished work shall meet the requirement of the relevant specifications, except as provided hereunder.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

Install TRPMs and/or spotting, if required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
140	Pavement Repairs (Manual)	m <sup>2</sup>

#### Testing Requirements

Minimum Test Frequency	
Unbound Pavements and Materials for Stabilisation	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Flakiness Index AS 1141.15	1 / Source / Year
CBR Q113A	1 / Source / Year
Degradation Factor Q208B	1 / Source / Year
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>

<b>Minimum Test Frequency</b>	
<b>Unbound Pavements and Materials for Stabilisation</b>	
Liquid Limit Q104A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>
<b>Asphalt / Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
<b>Asphalt Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months
<b>Geometrics</b>	
Horizontal Straightedge Q712	1 / Repair in Wheel Path and at Interface
Depth below Road Surface	1 / Layer / Each Repair
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.



## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Pavement breaker

Vibrating compactor or wacker packer

Emulsion sprayer

Water tanker

### **Materials**

Unbound pavement material to MRTS05 *Unbound Pavements*

Precoated screenings to MRTS22 *Supply of Cover Aggregate*

Bitumen to MRTS17 *Bitumen and Multigrade Bitumen*

Emulsion to MRTS17 *Bitumen and Multigrade Bitumen*

Asphalt to MRTS30 *Asphalt Pavements*

Sealing signs "Loose Stones" and "Avoid Windscreen Damage Drive Slowly"

### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Traffic controllers            2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. cracking?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair. Consider using a geotextile.
6. Note if road marking will be required. Schedule another Activity.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
8. Arrange for testing materials.
9. Arrange and specify a disposal area for excavated material.

10. Specify spray seal or asphalt surface. Specify asphalt depth, and
11. Schedule waterproofing (Activity Number 118) within four weeks if a cold laid premix is used and a reseal is not scheduled in that period.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. should be marked out already.
3. Excavate the failed area:
  - a. hand dig to locate services
  - b. make vertical face
  - c. sweep bases and edges, including surrounding area
  - d. place geotextile, if specified
  - e. stop work and notify supervisor if the base is wet or not firm at specified depth, and
  - f. truck excavated material to site specified by your supervisor.
4. Compact the base:
  - a. the compactor makes no more impressions, and
  - b. if specified, slope the base to give drainage and place drainage pipe.
5. Premix pavement material and water off-site:
  - a. bring material to right moisture content for compaction
  - b. uniform 75 – 100 mm layers, and
  - c. check compaction.
6. Place pavement Material:
  - a. fill isolated holes in base and compact.
7. Form the surface:
  - a. use grader, water and roller
  - b. check against the standard, and
  - c. allow surface to dry.

8. Apply seal or asphalt surfacing:
  - a. use Activity Number 117, steps 5 to 12, or Activity Number 138, steps 4 to 7.
9. Check the work against the Restoration Standards.
10. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains, and
  - c. notify supervisor if line marking required.
11. Re-establish line marking:
  - a. use TRPMs and/or spotting.
12. Remove traffic control:
  - a. clean / repair, as necessary.

#### **141 Temporary Pavement Repairs (Mechanical)**

##### **Description**

The temporary repair by mechanical trimming of shoved or rutted pavement to the level of the surrounding sealed surface to eliminate hazardous conditions until such time as permanent repairs can be made, or to keep safe a section of pavement where the Principal has advised more permanent type works (e.g. reconstruction / rehabilitation) is due to commence.

##### **Note**

For road sections not programmed for imminent permanent type works, individual repairs shall only be used where rapid deterioration of the pavement has not allowed sufficient time to schedule permanent repairs and shall only be performed once before permanent repairs are made. Includes the application of a bituminous emulsion seal coat and cover aggregate over the trimmed areas.

##### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the trimming of the rut or shove
- the compaction of the exposed roadway surface prior to applying the tack coat
- all work items as detailed in MRS12 *Concrete* and MRS22 *Supply of Cover Aggregate*
- the supply and application of a bitumen emulsion as per Applicable Specifications
- the precoating, spreading and rolling of cover aggregate (including the supply of all materials)
- the supply and installation of TRPMs or line spotting, as required
- all other operations included in the Applicable Specifications

- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any excavated / waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>

All excavated material shall be disposed of or stored in a neat and tidy manner away from the road formation and drainage lines. Material suitable for reuse shall be stored at nominated stockpile sites, unless otherwise agreed.

#### Restoration Standards

The finished work shall meet the requirements of the relevant specifications, except as provided hereunder.

The finished surface shall be within  $\pm 10$  mm of the surrounding surface. The deviation from a 3 m straightedge placed along the wheel paths shall be no more than  $\pm 10$  mm due allowance being made for design shape, where relevant.

Install TRPMs and/or spotting, if required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
141	Temporary Pavement Repairs (Mechanical)	m <sup>2</sup>

No other details are included in the Maintenance Activity Standard for this Activity.

### 142 Emergency Temporary Pavement Repairs

#### Description

The temporary repair of the roadway surface to eliminate hazardous conditions until such time as permanent repairs can be made or to keep safe a section of pavement where the Principal has advised more permanent type works (i.e. reconstruction / rehabilitation) is due to commence.

**Note**

For road sections not programmed for imminent permanent type works, individual repairs shall only be used where rapid deterioration of the pavement has not allowed sufficient time to schedule permanent repairs and shall only be performed once before permanent repairs are made.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the removal of cracked or loose material from the area to be repaired
- the supply and application of a bitumen emulsion tack coat for premix / asphalt treatment
- the supply, placement and compaction of the premix asphalt, gravel or asphalt material
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications, as warranted
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS05	<i>Unbound Pavements</i>
MRTS30	<i>Asphalt Pavements</i>
SS	Premix Asphalt

**Restoration Standards**

The finished surface shall be within  $\pm 20$  mm of the height of the surrounding road surface.

The standard of compaction shall be such that the final passes of the compaction equipment leave no visible impressions on the restored surface.

Install TRPMs and/or spotting, if required.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
142	Emergency Temporary Pavement Repairs	tonnes

**Testing Requirements**

Not applicable.

**Particular Planning Points to Consider**

1. This is an emergency repair to reduce traffic hazards during and immediately after bad weather. This repair is also applicable where more permanent types of works, such as rehabilitation are imminent, and
2. Such repairs should be inspected within a week to check their condition and to schedule an appropriate standard Activity for long term repair where more permanent type works, such as rehabilitation, are not imminent.

**143 Pavement Repairs, Gravel (Mechanical) – Minor****Description**

The repair by machine of shoving gravel pavement surfacing of size less than 500 m<sup>2</sup> by removal of the deteriorated pavement and replacement with new gravel pavement material to profile. May include treatment of subgrade materials and reworking, as appropriate.

Child Activities are to be used for depths of treatment as follows:

- 143 20 depth up to 200 mm
- 143 30 depth up to 300 mm
- 143 40 depth up to 400 mm, and
- 143 50 depth up to 500 mm.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area and confirmation of the pavement design
- excavation of the failed area to the approved pavement design depth, including the removal of any loose material from the area to be repaired. Where a road profiler is used, only areas inaccessible by the profiler's drum (i.e. generally at corners of the repair) will be accepted at a lesser depth than that approved. In these areas, a minimum depth shall be specified
- where applicable, compaction of the excavated surface (where the surface has been loosened)
- preparation of the existing surface, including brooming
- the formation of a vertical face to a minimum depth equal to the pavement design (measured from the top of the excavation) for the full length of the excavated edges. Where a road profiler

is used, a nominated reduced depth of vertical face will be accepted in areas where the shape of the profiler's drum does not allow the design depth to be achieved. The repairs shall be rectangular in shape

- the supply, placement and compaction of pavement material, cement treated, if appropriate
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>

The design of the repaired pavement shall conform to the pavement design standards of Department Transport and Main Roads.

Geotextiles on / under subgrade shall comply with the requirements specified for geotextiles under / within embankments in MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*.

The unbound pavement material shall be of a quality at least equal to that used in sound sections of the road adjacent to the repairs.

Plant-mix stabilised pavement shall be unbound pavement, as specified above, stabilised with not less than 2% by mass of cement.

The Principal may direct a paver be employed to place plant-mix stabilised pavement material or may approve the use of other equipment for this purpose. Such other equipment shall not cause the mix to segregate.

All excavated material shall be disposed of or stored in a neat and tidy manner away from the road formation and drainage lines. Material suitable for reuse shall be stored at nominated stockpile sites, unless otherwise agreed.

### Restoration Standards

The finished work shall meet the requirements of the relevant specifications, except as provided hereunder.

The finished surface shall conform to the shape of the surrounding road surface.

The deviation from a 3 m straightedge placed along the wheel paths shall be no more than + 8 mm, - 5 mm due allowance being made for design shape, where relevant.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
143	Pavement Repairs, Gravel (Mechanical) – Minor	m <sup>2</sup>

#### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
942100	Road excavation, all material	m <sup>3</sup>
	Geotextiles on / under subgrade	m <sup>2</sup>
933300	Subsoil drains, Type C	Metres
933400	Subsoil drains, Type D	Metres
	Plant-mix stabilised pavement (including cement and curing)	m <sup>3</sup>
	Sub-base, unbound pavement type (subtype)	m <sup>3</sup>
	Base, unbound pavement type (subtype)	m <sup>3</sup>

#### Testing Requirements

Minimum Test Frequency	
<b>Unbound Pavements and Materials for Stabilisation</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Flakiness Index AS 1141.15	1 / Source / Year
CBR Q113A	1 / Source / Year
Degradation Factor Q208B	1 / Source / Year
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Liquid Limit Q104A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
<b>Stabilised Material</b>	
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>
<b>Compaction - Earthworks</b>	
MDR AS 1289.5.1.1	1 / 500 m <sup>2</sup>
Density / Moisture Relationship (Rapid) AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Compaction (Dry Density Ratio or Hilf Density Ratio) and Moisture (Moisture Ratio, Moisture Variation or Hilf Moisture Variation) AS 1289.5.4.1	1 / 500 m <sup>2</sup>



<b>Minimum Test Frequency</b>	
or AS 1289.5.7.1	
Dry Density and Moisture Content AS 1289.5.8.1 or AS 1289.5.3.1	1 / 500 m <sup>2</sup>
<b>Compaction – Unbound Pavements</b>	
MDR Q142A, Q142B or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Compaction – Stabilised Pavements</b>	
MDR Q142A or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Asphalt</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
<b>Geometrics</b>	
Horizontal Straightedge Q712 (minimum 1 / Patch in Wheel Path and at Interface)	1 / 10 m
Depth below Road Surface	1 / 10 m / Layer
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. cracking?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair. On large areas, use a cone penetrometer to determine depth of excavation required. Specify this depth. Consider using a geotextile.
6. Note if road marking will be required. Schedule another Activity.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
8. Arrange for testing materials.
9. Arrange and specify a disposal area for excavated material, and
10. Specify spray seal or asphalt surface. Specify asphalt depth.

### **144 Subgrade Treatment in Conjunction with Pavement Repair Activity**

#### **Description**

The additional repair of subgrade required in excess of pavement repair covered by Activity Number 146. Also includes removal of deteriorated subgrade and replacement with suitable aggregate / geotextile.

#### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- determine the depth of excavation and prepare pavement design
- excavation of the failed area to the approved pavement design depth, including the removal of any loose material from the area to be repaired
- compaction of the excavated surface, if applicable (i.e. where the surface has been loosened)
- preparation of the existing surface, including brooming, if applicable
- the formation of a vertical face to a minimum depth equal to the pavement design (measured from the depth of pavement repair required in Activity Number 146). The repairs shall be rectangular in shape
- the supply and installation of geofabric, if required
- the supply, placement and compaction of rock fill, if required
- the supply, placement and compaction of cement treated pavement material, if required.

- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS07A	<i>In situ Stabilised Subgrades using Quicklime or Hydrated Lime</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS57	<i>Geotextiles for Geotextile Reinforced Seals</i>

The design of the repaired pavement shall conform to the pavement design standards of Department of Transport and Main Roads.

Geotextiles on / under subgrade shall comply with the requirements specified for geotextiles under / within embankments in MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*.

Rockfill shall be composed of sound stone pieces, the minimum size of which shall be 75 mm and the maximum size not greater than half the rockfill layer thickness.

The unbound pavement material shall be of a quality at least equal to that used in sound sections of the road adjacent to the repairs.

Plant-mix stabilised pavement shall be unbound pavements, as specified in MRTS05 *Unbound Pavements*, stabilised with not less than 2% by mass of cement.

All excavated material shall be disposed of or stored in a neat and tidy manner away from the road formation and drainage lines. Material suitable for reuse shall be stored at nominated stockpile sites, unless otherwise agreed.

#### Restoration Standards

The finished work shall meet the requirements of the relevant specifications, except as provided hereunder.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
144	Subgrade Treatment in Conjunction with Pavement Repair Activity	Dollars

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
942100	Road excavation, all material	m <sup>3</sup>
	Geotextiles on / under subgrade	m <sup>2</sup>
	Rockfill	m <sup>3</sup>
933300	Subsoil drains, Type C	Metres
933400	Subsoil drains, Type D	Metres
	Plant-mix stabilised pavement (including cement and curing)	m <sup>3</sup>
	Sub-base, unbound pavement type (subtype)	m <sup>3</sup>
	Base, unbound pavement type (subtype)	m <sup>3</sup>
955020	Tack coat m <sup>2</sup>	Litres
	Establishment / disestablishment of paver and paving gang at paving each site	Site

**Testing Requirements**

<b>Minimum Test Frequency</b>	
<b>Unbound Pavements and Materials for Stabilisation</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Flakiness Index AS 1141.15	1 / Source / Year
CBR Q113A	1 / Source / Year
Degradation Factor Q208B	1 / Source / Year
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Liquid Limit Q104A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
<b>Stabilised Material</b>	
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>
<b>Compaction - Earthworks</b>	
MDR AS 1289.5.1.1	1 / 500 m <sup>2</sup>
Density / Moisture Relationship (Rapid) AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Compaction (Dry Density Ratio or Hilf Density Ratio) and Moisture (Moisture Ratio, Moisture Variation or Hilf Moisture Variation) AS 1289.5.4.1 or AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Dry Density and Moisture Content AS 1289.5.8.1 or AS 1289.5.3.1	1 / 500 m <sup>2</sup>

<b>Minimum Test Frequency</b>	
<b>Compaction – Unbound Pavements</b>	
MDR Q142A, Q142B or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Compaction – Stabilised Pavements</b>	
MDR Q142A or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

#### **145 Scarify and Reshape Existing Pavement**

##### **Description**

The repair by machine of out of shape bituminous pavement (less than 500 m<sup>2</sup>) by scarifying and reshaping the existing pavement to profile, including appropriate bituminous surfacing works. May include the addition of some additional paving material to maintain road profile, as appropriate.

##### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS05	<i>Unbound Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

The unbound pavement material shall be of a quality at least equal to that used in sound sections of the road adjacent to the repairs.

The Principal's Delegate or his representative may direct that a paver be employed to place plant-mix stabilised and hot mixed asphalt pavement material or may approve the use of other equipment for this purpose. Such other equipment shall not cause the mix to segregate.

All excavated material shall be disposed of in a neat and tidy manner away from the road formation and drainage lines.

### Restoration Standards

The finished work shall meet the requirement of the relevant specifications, and as provided hereunder.

The Contractor shall demonstrate compliance with the requirements of MRTS30 *Asphalt Pavements* with respect to rolling pattern requirements and asphalt temperature at time of rolling commencement. The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
145	Scarify and Reshape Existing Pavement	m <sup>2</sup>

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
	Base, unbound pavement type	m <sup>3</sup>
955320	Tack coat m <sup>2</sup>	Litres
	Establishment / disestablishment of paver and paving gang at paving site	Each
	Dense graded asphalt pavement, 10 mm mix	tonnes
956100	Prime (grade, rate m <sup>2</sup> )	Litres
956200	Primerseal (grade, rate m <sup>2</sup> )	Litres
956300	Seal (class, rate m <sup>2</sup> )	m <sup>2</sup>
956600	Spreading prime cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
956700	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m <sup>3</sup>
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m <sup>3</sup>
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (modified bitumen Class 170 + % SBS polymer)	tonnes
956920	Supply of material (bitumen cutter)	tonnes
956930	Supply of material (adhesion agent)	Kilograms

**Testing Requirements**

<b>Minimum Test Frequency</b>	
<b>Unbound Pavements</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Flakiness Index AS 1141.15	1 / Source / Year
CBR Q113A	1 / Source / Year
Degradation Factor Q208B	1 / Source / Year
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Liquid Limit Q104A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
MDR Q142A, Q142B or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup> (1 / Lot minimum)
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Asphalt / Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Temperature at Time of Rolling Commencement	6 / Lot minimum
<b>Asphalt / Premix Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months
<b>Geometrics</b>	
Horizontal Straightedge Q712	1 / 10 m
Depth below Road Surface	1 / 10 m / Layer
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year

<b>Minimum Test Frequency</b>	
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
<b>Bitumen</b>	
Bitumen – Sample Q080	1 / Tank
Bitumen Emulsion Sample	1 / 5000 L
<b>Application Rates</b>	
Spraying Records. Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Grader

Vibrating steel drum roller

Bitumen / emulsion sprayer

Front-end loader

Trucks

Rotary broom

Water tanker

### **Materials**

Unbound pavement material to MRTS05 *Unbound Pavements*

Precoated screenings to MRTS22 *Supply of Cover Aggregate*

Asphalt to MRTS30 *Asphalt Pavements*

Bitumen to MRTS17 *Bitumen and Multigrade Bitumen*

Emulsion to MRTS21 *Bituminous Emulsion*

Sealing signs "Loose Stones" and "Avoid Windscreen Damage Drive Slowly"



### **Manpower Requirements**

Leading hand	1
Labourers	2
Operators	2
Truck drivers	
Traffic controllers	2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. shoving?
4. Is an alternative remedy more appropriate?
5. Mark out the area for repair.
6. Note if road marking will be required. Schedule another Activity.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
8. Arrange for testing materials.
9. Specify spray seal or asphalt surface. Specify asphalt depth, and
10. Schedule waterproofing (Activity Number 118) within four weeks if a cold laid premix is used and a reseal is not scheduled in that period.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. should be marked out already.

3. Scarify existing pavement, and reshape:
  - a. scarify deep enough to provide a minimum 75 mm compacted remixed layer after reshaping and addition of any new material
  - b. spread additional material, as required
  - c. reshape to correct road profile, and
  - d. mix in water for compaction.
4. Compact the base:
  - a. bring material to right moisture content for compaction
  - b. uniform 75 – 100 mm layers, and
  - c. check compaction.
5. Form the surface:
  - a. use grader, water and roller
  - b. check against the standard, and
  - c. allow surface to dry.
6. Apply seal or asphalt surfacing:
  - a. use Activity Number 117, steps 5 to 12. or Activity Number 138, steps 4 to 7.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains, and
  - c. notify supervisor if line marking required.
9. Re-establish line marking:
  - a. use TRPMs or spotting.
10. Remove traffic control:
  - a. clean / repair, as necessary.

#### **146 Pavement Repairs, Asphalt (Mechanical) – Minor (< 500 m<sup>2</sup>)**

##### **Description**

The repair by machine of shoving pavement or asphalt surfacing of size less than 500 m<sup>2</sup> by removal of the deteriorated pavement and/or asphalt surface and replacement with new pavement material and asphalt or bitumen seal treatment to profile. May include treatment of subgrade materials and reworking, as appropriate. Treatment of areas greater than greater than 500 m<sup>2</sup> are covered by Activity Number 147.

Child Activities are to be used for depths of treatment as follows:

- 143 20 depth up to 200 mm
- 143 30 depth up to 300 mm

- 143 40 depth up to 400 mm, and
- 143 50 depth up to 500 mm.

### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area and confirmation of the pavement design
- excavation of the failed area to the approved pavement design depth, including the removal of any loose material from the area to be repaired. Where a road profiler is used, only areas inaccessible by the profiler's drum (i.e. generally at corners of the repair) will be accepted at a lesser depth than that approved. In these areas, a minimum depth shall be specified
- where applicable, compaction of the excavated surface (where the surface has been loosened)
- preparation of the existing surface, including brooming
- the formation of a vertical face to a minimum depth equal to the pavement design (measured from the top of the excavation) for the full length of the excavated edges. Where a road profiler is used, a nominated reduced depth of vertical face will be accepted in areas where the shape of the profiler's drum does not allow the design depth to be achieved. The repairs shall be rectangular in shape
- the supply, placement and compaction of pavement material, cement treated, if appropriate
- the supply and application of a bitumen emulsion tack coat, if applicable, as per Applicable Specifications
- the supply, placement and compaction of the asphalt or the supply and application of a bitumen seal treatment to profile, as appropriate
- the supply and installation of TRPMs or line spotting, as required
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

**Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavement</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

The design of the repaired pavement shall conform to the pavement design standards of Department of Transport and Main Roads.

Geotextiles on / under subgrade shall comply with the requirements specified for geotextiles under / within embankments in MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*.

The unbound pavement material shall be of a quality at least equal to that used in sound sections of the road adjacent to the repairs.

Plant-mix stabilised pavement shall be unbound pavement, as specified above, stabilised with not less than 2% by mass of cement.

The Principal may direct that a paver be employed to place plant-mix stabilised and/or dense graded asphalt pavement material or may approve the use of other equipment for this purpose. Such other equipment shall not cause the mix to segregate.

All excavated material shall be disposed of or stored in a neat and tidy manner away from the road formation and drainage lines. Material suitable for reuse shall be stored at nominated stockpile sites, unless otherwise agreed.

**Restoration Standards**

The finished work shall meet the requirements of the relevant specifications, except as provided hereunder.

The finished surface shall conform to the shape of the surrounding road surface.

Install TRPMs and/or spotting, if required.

The deviation from a 3 m straightedge placed along the wheel paths shall be no more than + 8 mm, - 5 mm due allowance being made for design shape, where relevant.

The Contractor shall demonstrate compliance with the requirements of MRS30 *Asphalt Pavements* with respect to rolling pattern requirements and asphalt temperature at time of rolling commencement.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
146	Pavement Repairs, Asphalt (Mechanical) – Minor (< 500 m <sup>2</sup> )	m <sup>2</sup>

#### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
942100	Road excavation, all material	m <sup>3</sup>
	Geotextiles on / under subgrade	m <sup>2</sup>
933000	Subsoil drains, Type C	Metres
933400	Subsoil drains, Type D	Metres
	Plant-mix stabilised pavement (including cement and curing)	m <sup>3</sup>
	Sub-base, unbound pavement type (subtype)	m <sup>3</sup>
	Base, unbound pavement type (subtype)	m <sup>3</sup>
955020	Tack coat m <sup>2</sup>	Litres
	Establishment / disestablishment of paver and paving gang at paving site	Each
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
956100	Prime (grade, rate m <sup>2</sup> )	Litres
956200	Primerseal (grade, rate m <sup>2</sup> )	Litres
956300	Seal (class, rate m <sup>2</sup> )	Litres
956600	Spreading prime cover material (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
956700	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m <sup>3</sup>
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m <sup>3</sup>
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (modified bitumen Class 170 + % SBS polymer)	tonnes
956920	Supply of material (bitumen cutter)	tonnes
956930	Supply of material (adhesion agent)	Kilograms

**Testing Requirements**

<b>Minimum Test Frequency</b>	
<b>Unbound Pavements</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Flakiness Index AS 1141.15	1 / Source / Year
CBR Q113A	1 / Source / Year
Degradation Factor Q208B	1 / Source / Year
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Liquid Limit Q104A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
<b>Stabilised Material</b>	
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>
<b>Compaction – Earthworks</b>	
MDR AS 1289.5.1.1	1 / 500 m <sup>2</sup>
Density / Moisture Relationship (Rapid) AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Compaction (Dry Density Ratio or Hilf Density Ratio) and Moisture (Moisture Ratio, Moisture Variation or Hilf Moisture Variation) AS 1289.5.4.1 or AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Dry Density and Moisture Content AS 1289.5.8.1 or AS 1289.5.3.1	1 / 500 m <sup>2</sup>
<b>Compaction – Unbound Pavements</b>	
MDR Q142A, Q142B or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q142B	1 / 500 m <sup>2</sup>
<b>Compaction – Stabilised Pavements</b>	
MDR Q142A or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Asphalt</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year

<b>Minimum Test Frequency</b>	
Temperature at Time of Rolling Commencement	6 / Lot minimum
<b>Asphalt Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months
<b>Geometrics</b>	
Horizontal Straightedge Q712 (minimum 1 / Patch in Wheel Path and at Interface)	1 / 10 m
Depth below Road Surface	1 / 10 m / Layer
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
Bitumen – Sample Q080	1 / Tank
Bitumen Emulsion Sample	1 / 5000 L
<b>Application Rates</b>	
Spraying Records. Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

#### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.

3. Are there any related defects, e.g. cracking?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair. On large areas, use a cone penetrometer to determine depth of excavation required. Specify this depth. Consider using a geotextile.
6. Note if road marking will be required. Schedule another Activity.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
8. Arrange for testing materials.
9. Arrange and specify a disposal area for excavated material, and
10. Specify spray seal or asphalt surface. Specify asphalt depth.

#### **147 Pavement Repairs, Gravel (Mechanical) – Major ( $\geq 500 \text{ m}^2$ )**

##### **Description**

The repair by machine of shoving pavement surfacing of size greater than  $500 \text{ m}^2$  by removal of deteriorated gravel pavement and replacement with new pavement material to profile. May include treatment of subgrade materials and reworking, as appropriate. Refers to pavement repairs greater than 200 mm nominal depth.

##### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- determine the depth of excavation and prepare pavement design
- excavation of the failed area to the approved pavement design depth, including the removal of any loose material from the area to be repaired. Should a road profiler be used, only in areas inaccessible by the profiler's drum (i.e. generally the corners of the repairs) will be accepted at a lesser depth than that approved. In these areas, a minimum depth shall be specified
- compaction of the excavated surface, if applicable (i.e. where the surface has been loosened)
- preparation of the existing surface, including brooming, if applicable
- the formation of a vertical face to a minimum depth equal to the pavement design (measured from the top of the excavation) for the full length of the excavated edges. Where a road profiler is used, a nominated reduced depth of vertical face will be accepted in areas where the shape of the profiler's drum does not allow the design depth to be achieved. The repairs shall be rectangular in shape
- the supply and installation of geofabric, if required
- the supply, placement and compaction of rock fill, if required
- the supply, placement and compaction of cement treated pavement material



- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

The design of the repaired pavement shall conform to the pavement design standards of Department of Transport and Main Roads.

Geotextiles on / under subgrade shall comply with the requirements specified for geotextiles under / within embankments in MRS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*.

Rockfill shall be composed of sound stone pieces, the minimum size of which shall be 75 mm and the maximum size not greater than half the rockfill layer thickness.

The unbound pavement material shall be of a quality at least equal to that used in sound sections of the road adjacent to the repairs.

Plant-mix stabilised pavement shall be unbound pavement, as specified in MRS05 *Unbound Pavements*, stabilised with not less than 2% by mass of cement.

The Principal may direct that a paver be employed to place plant-mix stabilised and/or dense graded asphalt pavement material or may approve the use of other equipment for this purpose. Such other equipment shall not cause the mix to segregate.

All excavated material shall be disposed of or stored in a neat and tidy manner away from the road formation and drainage lines. Material suitable for reuse shall be stored at nominated stockpile sites, unless otherwise agreed.

### Restoration Standards

The finished work shall meet the requirements of the relevant specifications, except as provided hereunder.

The Contractor shall demonstrate compliance with the requirements of MRS30 *Asphalt Pavements* with respect to rolling pattern requirements and asphalt temperature at time of rolling commencement. The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

The finished surface shall conform to the shape of the surrounding surface. The deviation from a 3 m straightedge placed along the wheel paths shall be no more than + 8 mm, - 5 mm due allowance being made for design shape, where relevant.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
147	Pavement Repairs, Gravel (Mechanical) – Major ( $\geq 500 \text{ m}^2$ )	$\text{m}^2$

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
942100	Road excavation, all material	$\text{m}^3$
	Geotextiles on / under subgrade	$\text{m}^2$
	Rockfill	$\text{m}^3$
933000	Subsoil drains, Type C	Metres
933400	Subsoil drains, Type D	Metres
	Plant-mix stabilised pavement (including cement and curing)	$\text{m}^3$
	Sub-base, unbound pavement type (subtype)	$\text{m}^3$
	Base, unbound pavement type (subtype)	$\text{m}^3$

### Testing Requirements

Minimum Test Frequency	
Unbound Pavements and Materials for Stabilisation	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Flakiness Index AS 1141.15	1 / Source / Year

<b>Minimum Test Frequency</b>	
CBR Q113A	1 / Source / Year
Degradation Factor Q208B	1 / Source / Year
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Liquid Limit Q104A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
<b>Stabilised Material</b>	
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>
<b>Compaction – Earthworks</b>	
MDR AS 1289.5.1.1	1 / 500 m <sup>2</sup>
Density / Moisture Relationship (Rapid) AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Compaction (Dry Density Ratio or Hilf Density Ratio) and Moisture (Moisture Ratio, Moisture Variation or Hilf Moisture Variation) AS 1289.5.4.1 or AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Dry Density and Moisture Content AS 1289.5.8.1 or AS 1289.5.3.1	1 / 500 m <sup>2</sup>
<b>Compaction – Unbound Pavement</b>	
MDR Q142A, Q142B or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Compaction – Stabilised Pavement</b>	
MDR Q142A or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Geometrics</b>	
Horizontal Straightedge Q712 (minimum 1 / Patch in Wheel Path and at Interface)	1 / 10 m
Depth below Road Surface	1 / 10 m / Layer

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. cracking?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair. On large areas, use a cone penetrometer to determine depth of excavation required. Specify this depth. Consider using a geotextile.
6. Note if road marking will be required. Schedule another Activity.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
8. Arrange for testing materials.
9. Arrange and specify a disposal area for excavated material, and
10. Specify spray seal or asphalt surface. Specify asphalt depth.

### **148 Pavement Repairs, Asphalt Gravel (Mechanical) – Major ( $\geq 500 \text{ m}^2$ )**

#### **Description**

The repair by machine of shoving pavement surfacing of size greater than  $500 \text{ m}^2$  by removal of deteriorated pavement and/or asphalt or surface and replacement with new pavement material and asphalt, bitumen seal treatment to profile. May include treatment of subgrade materials and reworking, as appropriate. Refers to pavement repairs greater than 200 mm nominal depth.

#### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- determine the depth of excavation and prepare pavement design
- excavation of the failed area to the approved pavement design depth, including removal of any loose material from the area to be repaired. Should a road profiler be used, only in areas inaccessible by the profiler's drum (i.e. generally the corners of the repairs) will be accepted at a lesser depth than that approved. In these areas, a minimum depth shall be specified
- compaction of the excavated surface, if applicable (i.e. where the surface has been loosened)
- preparation of the existing surface, including brooming, if applicable

- the formation of a vertical face to a minimum depth equal to the pavement design (measured from the top of the excavation) for the full length of the excavated edges. Where a road profiler is used, a nominated reduced depth of vertical face will be accepted in areas where the shape of the profiler's drum does not allow the design depth to be achieved. The repairs shall be rectangular in shape
- the supply and installation of geofabric, if required
- the supply, placement and compaction of rock fill, if required
- the supply, placement and compaction of cement treated pavement material
- the supply and application of a bitumen emulsion tack coat - refer to Applicable Specifications
- the supply, placement and compaction of the asphalt, or the supply and application of a bitumen seal treatment to profile, as appropriate
- the supply and installation of TRPMs or line spotting, as required
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavement</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

The design of the repaired pavement shall conform to the pavement design standards of Department of Transport and Main Roads.

Geotextiles on / under subgrade shall comply with the requirements specified for geotextiles under / within embankments in MRS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*.

Rockfill shall be composed of sound stone pieces, the minimum size of which shall be 75 mm and the maximum size not greater than half the rockfill layer thickness.

The unbound pavement material shall be of a quality at least equal to that used in sound sections of the road adjacent to the repairs.

Plant-mix stabilised pavement shall be unbound pavement, as specified in MRS05 *Unbound Pavements*, stabilised with not less than 2% by mass of cement.

The Principal may direct that a paver be employed to place plant-mix stabilised and/or dense graded asphalt pavement material or may approve the use of other equipment for this purpose. Such other equipment shall not cause the mix to segregate.

All excavated material shall be disposed of or stored in a neat and tidy manner away from the road formation and drainage lines. Material suitable for reuse shall be stored at nominated stockpile sites, unless otherwise agreed.

### Restoration Standards

The finished work shall meet the requirements of the relevant specifications, except as provided hereunder.

The Contractor shall demonstrate compliance with the requirements of MRS30 *Asphalt Pavements* with respect to rolling pattern requirements and asphalt temperature at time of rolling commencement. The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

The finished surface shall conform to the shape of the surrounding surface. The deviation from a 3 m straightedge placed along the wheel paths shall be no more than + 8 mm, - 5 mm due allowance being made for design shape, where relevant.

Install TRPMs and/or spotting, if required.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
148	Pavement Repairs, Asphalt Gravel (Mechanical) – Major ( $\geq 500 \text{ m}^2 / \text{km}$ )	$\text{m}^3$

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
942100	Road excavation, all material	$\text{m}^3$
	Geotextiles on / under subgrade	$\text{m}^2$
	Rockfill	$\text{m}^3$
933000	Subsoil drains, Type C	Metres
933400	Subsoil drains, Type D	Metres
	Plant-mix stabilised pavement (including cement and curing)	$\text{m}^3$

Item	Description	Units of Measurement
	Sub-base, unbound pavement type (subtype)	m <sup>3</sup>
	Base, unbound pavement type (subtype)	m <sup>3</sup>
955020	Tack coat m <sup>2</sup>	Litres
	Establishment / disestablishment of paver and paving gang at paving each site	Site
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
956100	Prime (grade, rate m <sup>2</sup> )	Litres
956200	Primerseal (grade, rate m <sup>2</sup> )	Litres
956300	Seal (class, rate m <sup>2</sup> )	Litres
956600	Spreading prime cover material (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
956700	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m <sup>3</sup>
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m <sup>3</sup>
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (modified bitumen Class 170 + % SBS polymer)	tonnes
956920	Supply of material (bitumen cutter)	tonnes
956930	Supply of material (adhesion agent)	Kilograms

### Testing Requirements

Minimum Test Frequency	
<b>Unbound Pavements and Materials for Stabilisation</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Flakiness Index AS 1141.15	1 / Source / Year
CBR Q113A	1 / Source / Year
Degradation Factor Q208B	1 / Source / Year
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Liquid Limit Q104A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
<b>Stabilised Material</b>	
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>

<b>Minimum Test Frequency</b>	
<b>Compaction – Earthworks</b>	
MDR AS 1289.5.1.1	1 / 500 m <sup>2</sup>
Density / Moisture Relationship (Rapid) AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Compaction (Dry Density Ratio or Hilf Density Ratio) and Moisture (Moisture Ratio, Moisture Variation or Hilf Moisture Variation) AS 1289.5.4.1 or AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Dry Density and Moisture Content AS 1289.5.8.1 or AS 1289.5.3.1	1 / 500 m <sup>2</sup>
<b>Compaction – Unbound Pavement</b>	
MDR Q142A, Q142B or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Compaction – Stabilised Pavement</b>	
MDR Q142A or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Asphalt / Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Temperature at Time of Rolling Commencement	6 / Lot minimum
<b>Asphalt Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months
<b>Geometrics</b>	
Horizontal Straightedge Q712 (minimum 1 / Patch in Wheel Path and at Interface)	1 / 10 m
Depth below Road Surface	1 / 10 m / Layer



<b>Minimum Test Frequency</b>	
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
<b>Bitumen</b>	
Bitumen – Sample Q080	1 / Tank
Bitumen Emulsion Sample	1 / 5000 L
<b>Application Rates</b>	
Spraying Records. Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

#### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. cracking?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair. On large areas, use a cone penetrometer to determine depth of excavation required. Specify this depth. Consider using a geotextile.
6. Note if road marking will be required. Schedule another Activity.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
8. Arrange for testing materials.
9. Arrange and specify a disposal area for excavated material, and
10. Specify spray seal or asphalt surface. Specify asphalt depth.

**151 Gravel Supply – Insitu Stabilisation****Description**

The supply of paving material for Activity Number 151. Includes all costs associated with the winning of the material for the works.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- all operations involved with winning of the gravel / material for the job site
- the provision of traffic control for quarrying operations
- all other operations included in the Applicable Specifications, and
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

**Applicable Specifications**

Reference	Title
MRTS05	<i>Unbound Pavements</i>

**Restoration Standards**

Nil. Supply only.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
151	Gravel Supply – Insitu Stabilisation	m <sup>3</sup> (loose)

**Testing Requirements**

Minimum Test Frequency	
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
CBR Q113A	1 / Source / Year

**Particular Points to Consider**

Nil. Winning only.

**152 Gravel Cartage – Insitu Stabilisation****Description**

The cartage of paving material for Activity Number 151. Includes all costs associated with the loading and cartage of the material to the work site.

### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- all operations involved with loading and cartage of the gravel / material for the job site
- the provision of traffic control for quarrying, cartage and delivery operations
- all other operations included in the Applicable Specifications, and
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS05	<i>Unbound Pavement</i>

### Restoration Standards

Nil. Cartage only.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
152	Gravel Cartage – Insitu Stabilisation	m <sup>3</sup> (loose) / km

### Testing Requirements

Nil.

### Particular Planning Points to Consider

Nil. Load and cart only.

### 153 Insitu Stabilisation – Minor (< 500 m<sup>2</sup>)

#### Description

The stabilisation in place of a subgrade or an existing pavement (less than 500 m<sup>2</sup>) by the addition of a hydraulic stabilising agent. May include the addition of paving material to maintain profiles, as appropriate.

### Work Operations

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- offsetting the centreline and edge lines for line marking purposes

- the supply and spreading of the stabilising agent – 2% GP cement (or as requested / approved)
- the mixing of the stabilised material
- the compaction of the stabilised material
- the grading of the compacted pavement to the correct profile
- keeping the surface moist until the seal is applied
- the submission of the seal design (emulsion) for acceptance
- application of the emulsion seal
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS05	<i>Unbound Pavement</i>
MRTS07A	<i>Insitu Stabilised Subgrades using Quicklime or Hydrated Lime</i>
MRTS07B	<i>Insitu Stabilised Pavements using Cement or Cementitious Blends</i>
MRTS07C	<i>Insitu Stabilised Pavements using Foamed Bitumen</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

#### **Restoration Standards**

The finished work shall meet the requirements of the relevant specifications, and as provided hereunder.

The deviation from a straightedge placed on the finished surface and the adjoining road surface shall not exceed 5 mm.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
153	Insitu Stabilisation – Minor (< 500 m <sup>2</sup> )	m <sup>3</sup>

#### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
953300	Insitu stabilisation	m <sup>3</sup>
953600	Supply of stabilisation agent	tonnes
953800	Curing coat m <sup>2</sup>	Litres
953900	Cover material	m <sup>3</sup>
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
956300	Seal (class, rate m <sup>2</sup> )	Litres
956700	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m <sup>3</sup>
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m <sup>3</sup>
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (modified bitumen Class 170 + % SBS polymer)	tonnes
956920	Supply of material (bitumen cutter)	tonnes
956930	Supply of material (adhesion agent)	Kilograms

#### Testing Requirements

Minimum Test Frequency	
Stabilised Material	
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>
Spread Rate Q719 Note: Testing for stabilising agent content may be represented by surface spread rate(s), as specified by Clause 1 of Addendum 1 in MRTS07A <i>Insitu Stabilised Subgrades using Quicklime or Hydrated Lime</i> , MRTS07B <i>Insitu Stabilised Pavements using Cement or Cementitious Blends</i> or MRTS07C <i>Insitu Stabilised Pavements using Foamed Bitumen</i>	1 / 100 m <sup>3</sup>

<b>Minimum Test Frequency</b>	
<b>Compaction</b>	
MDR Q142A or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup> (1 / Lot minimum)
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup> (1 / Lot minimum)
<b>Asphalt</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Temperature at Time of Rolling Commencement	6 / Lot minimum
<b>Asphalt Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months
<b>Geometrics</b>	
Horizontal Straightedge	1 / 10 m
Depth below Road Surface	1 / 10 m / Layer
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
<b>Bitumen</b>	
Bitumen Sample Q080	1 / Tank
Bitumen Emulsion Sample	1 / 5000 L
<b>Application Rates – Spraying Records</b>	
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

#### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. shoving?
4. Is an alternative remedy more appropriate?
5. Mark out the area for treatment. Specify the depth of treatment. Check location / depth of any services.
6. Note if road marking will be required. Schedule another Activity.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
8. Arrange for testing materials, and
9. Specify spray seal or asphalt surface. Specify asphalt depth.

#### **154 Insitu Stabilisation – Major ( $\geq 500 \text{ m}^2$ )**

##### **Description**

The stabilisation in place of a subgrade or an existing pavement (greater than  $500 \text{ m}^2$ ) by the addition of a hydraulic stabilising agent. May include the addition of paving material to maintain profiles, as appropriate.

##### **Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- offsetting the centreline and edge lines for line marking purposes
- the supply and spreading of the stabilising agent – 2% GP cement (or as requested / approved)
- the mixing of the stabilised material
- the compaction of the stabilised material
- the grading of the compacted pavement to the correct profile
- keeping the surface moist until the seal is applied

- the submission of the seal design (emulsion) for acceptance
- application of the emulsion seal
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS05	<i>Unbound Pavement</i>
MRTS07A	<i>Insitu Stabilised Subgrades using Quicklime or Hydrated Lime</i>
MRTS07B	<i>Insitu Stabilised Pavements using Cement or Cementitious Blends</i>
MRTS07C	<i>Insitu Stabilised Pavements using Foamed Bitumen</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

#### Restoration Standards

The finished work shall meet the requirements of the relevant specifications, and as provided hereunder.

The deviation from a straightedge placed on the finished surface and the adjoining road surface shall not exceed 5 mm.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
154	Insitu Stabilisation – Major ( $\geq 500 \text{ m}^2$ )	$\text{m}^3$



**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
953300	In situ stabilisation	m <sup>3</sup>
953600	Supply of stabilisation agent	tonnes
953800	Curing coat m <sup>2</sup>	Litres
953900	Cover material	m <sup>3</sup>
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
956300	Seal (class, rate m <sup>2</sup> )	Litres
956700	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m <sup>3</sup>
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m <sup>3</sup>
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (modified bitumen Class 170 + % SBS polymer)	tonnes
956920	Supply of material (bitumen cutter)	tonnes
956930	Supply of material (adhesion agent)	Kilograms

**Testing Requirements**

<b>Minimum Test Frequency</b>	
<b>Stabilised Material</b>	
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>
Spread Rate Q719 Note: Testing for stabilising agent content may be represented by surface spread rate(s), as specified by Clause 1 of Addendum 1 in MRTS07A <i>In situ Stabilised Subgrades using Quicklime or Hydrated Lime</i> , MRTS07B <i>In situ Stabilised Pavements using Cement or Cementitious Blends</i> or MRTS07C <i>In situ Stabilised Pavements using Foamed Bitumen</i>	1 / 100 m <sup>3</sup>
<b>Compaction</b>	
MDR Q142A or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and In situ Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup> (1 / Lot minimum)
<b>Asphalt</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year

<b>Minimum Test Frequency</b>	
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Temperature at Time of Rolling Commencement	6 / Lot minimum
<b>Asphalt Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months
<b>Geometrics</b>	
Horizontal Straightedge Q712	1 / 10 m
Depth below Road Surface	1 / 10 m / Layer
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Degree of Precoating Q216	1 / 400 t
<b>Bitumen</b>	
Bitumen Sample Q080	1 / Tank
Bitumen Emulsion Sample	1 / 5000 L
<b>Application Rates – Spraying Records</b>	
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. shoving?
4. Is an alternative remedy more appropriate?
5. Mark out the area for treatment. Specify the depth of treatment. Check location / depth of any services.
6. Note if road marking will be required. Schedule another Activity.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these. Ensure the surface material will give a texture consistent with the adjoining road, or schedule texturing.
8. Arrange for testing materials, and
9. Specify spray seal or asphalt surface. Specify asphalt depth.

### 155 Asphalt Overlay – Major ( $\geq 150$ m)

#### Description

The repair of existing bituminous roadway exhibiting surface distress through the applications of an asphalt overlay.

#### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- preparation of the existing surface, including the installation of offset points for the spotting of the centre and edge lines upon completion of the overlay
- protection of service facilities (e.g. manhole covers etc)
- all work items as detailed in MRTS12 *Sprayed Bituminous Emulsion Surfacing* and MRTS22 *Supply of Cover Aggregate*
- the supply and application of a bitumen emulsion tack coat – refer to Applicable Specifications
- the supply, laying and compaction of asphalt – refer to Applicable Specifications. The type of asphalt may include any of those listed under the materials section for this Activity
- the supply and installation of TRPMs or line spotting, as required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing

- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS30	<i>Asphalt Pavements</i>

#### Restoration Standards

As per Applicable Specifications above.

The Contractor shall demonstrate compliance with the requirements of the Applicable Specifications above with respect to rolling pattern requirements and asphalt temperature at time of rolling commencement. The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

Install TRPMs and/or spotting, as required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
155	Asphalt Overlay – Major ( $\geq 150$ m)	tonnes

#### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
955010	Preparation of existing surface	m <sup>2</sup>
955320	Tack coat m <sup>2</sup>	Litres
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
955870	Dense graded asphalt pavement, 20 mm mix	tonnes
955890	Dense graded asphalt pavement, 40 mm mix	tonnes
955040	Dense graded asphalt pavement, DG7 mix	tonnes
955050	Dense graded asphalt pavement, DG10 mix	tonnes
955060	Dense graded asphalt pavement, DG14 mix	tonnes
955070	Dense graded asphalt pavement, DG20 mix	tonnes
955080	Dense graded asphalt pavement, DG28 mix	tonnes
955150	Low rut dense graded asphalt pavement, DG10 mix	tonnes
955160	Low rut dense graded asphalt pavement, DG14 mix	tonnes
955170	Low rut dense graded asphalt pavement, DG20 mix	tonnes
955450	Open graded asphalt pavement, OG10 mix	tonnes

Item	Description	Units of Measurement
955460	Open graded asphalt pavement, OG14 mix	tonnes
	Establishment / disestablishment of paver and paving gang at paving site	Each

### Testing Requirements

Minimum Test Frequency	
<b>Asphalt / Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Temperature at Time of Rolling Commencement	6 / Lot minimum
<b>Asphalt Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months
<b>Geometrics</b>	
Horizontal Q712	1 / 50 m
Vertical – Height or Thickness	1 / 20 m
Vertical – Straightedge Q712	1 / 20 m
Vertical – Surface Evenness Q708B	1 / 100 m
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?

5. Is an alternative remedy more appropriate?
6. Define the area for overlay.
7. Note if road marking will be required. Schedule another Activity.
8. Arrange for testing materials, and
9. Specify the appropriate plant, materials and crew (including quantities of material) and organise these.

**157 Excavate and Replace Asphalt Wearing Surface (< 75 mm, for areas < 150 m)**

**Description**

The excavation of deteriorated asphalt and the restoration to profile with new asphalt in one operation, for asphalt < 75 mm and areas < 1500 m<sup>2</sup>.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- excavation of the failed area to a nominal depth, including the removal of any loose material from the area to be repaired. Where a road profiler is used, only areas inaccessible by the profiler's drum (i.e. generally at corners of the repair) will be accepted at a lesser depth than that approved. In these areas, a minimum depth shall be specified
- where applicable, compaction of the excavated surface (where the surface has been loosened)
- preparation of the existing surface, including brooming
- the formation of a vertical face to a nominated depth of (measured from the top of the excavation) for the full length of the excavated edges. Where a road profiler is used, a nominated reduced depth of vertical face will be accepted in areas where the shape of the profiler's drum does not allow the design depth to be achieved. The repairs shall be rectangular in shape
- the supply and application of a bitumen emulsion tack as per Applicable Specifications
- the supply, placement and compaction of the asphalt
- the supply and installation of TRPMs or line spotting, as required
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing
- the clean up of the site, including the disposal of any waste / excavated material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to Principal of line marking requirements.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS30	<i>Asphalt Pavements</i>

#### Restoration Standards

As per Applicable Specifications above.

The Contractor shall demonstrate compliance with the requirements of the Applicable Specifications above with respect to rolling pattern requirements and asphalt temperature at time of rolling commencement. The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

Install TRPMs and/or spotting, if required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
157	Excavate and Replace Asphalt Wearing Surface (< 75 mm, for areas < 150 m)	tonnes

#### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
912100	Provision for traffic	Lump Sum
	Excavation of existing surface	m <sup>2</sup>
955320	Tack coat m <sup>2</sup>	Litres
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
955870	Dense graded asphalt pavement, 20 mm mix	tonnes
955890	Dense graded asphalt pavement, 40 mm mix	tonnes
955040	Dense graded asphalt pavement, DG7 mix	tonnes
955050	Dense graded asphalt pavement, DG10 mix	tonnes
955060	Dense graded asphalt pavement, DG14 mix	tonnes
955070	Dense graded asphalt pavement, DG20 mix	tonnes
955080	Dense graded asphalt pavement, DG28 mix	tonnes
955150	Low rut dense graded asphalt pavement, DG10 mix	tonnes
955160	Low rut dense graded asphalt pavement, DG14 mix	tonnes
955170	Low rut dense graded asphalt pavement, DG20 mix	tonnes
955450	Open graded asphalt pavement, OG10 mix	tonnes

Item	Description	Units of Measurement
955460	Open graded asphalt pavement, OG14 mix	tonnes
	Establishment / disestablishment of paver and paving gang at paving site	Each

### Testing Requirements

Minimum Test Frequency	
<b>Asphalt / Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Asphalt Temperature at Time of Rolling Commencement	6 / Lot minimum
<b>Asphalt Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months
<b>Geometrics</b>	
Horizontal Straightedge (Wheelpath) Q712	1 / 10 m (minimum 1 / Patch)
Horizontal Straightedge (Interface) Q712	1 / 10 m (minimum 1 / Patch)
Depth below Road Surface	1 / 10 m (minimum 1 / Patch)
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?



6. Define the area for treatment.
7. Note if road marking will be required. Schedule another Activity, and
8. Specify the appropriate plant, materials and crew (including quantities of material) and organise these.

### 158 Excavate and Replace Asphalt Wearing Surface (RAMC only)

Details to be advised.

### 160 Recycling

#### Description

The heating and removal of an existing asphalt surface, the incorporation of rejuvenating agent and new dense graded asphalt, and the relaying and compaction of the mixed material.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS30	<i>Asphalt Pavements</i>
SS	Recycling Asphalt Pavements

#### Restoration Standards

As per Applicable Specifications above.

The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.

The deviation from a straightedge placed on the finished surface and the adjoining road surface shall not exceed 5 mm.

Install TRPMs and/or spotting, if required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
160	Recycling	m <sup>3</sup>

#### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
912100	Provision for traffic	Lump Sum
	Recycling of existing asphalt surface	m <sup>2</sup>
955860	Dense graded asphalt pavement, 14 mm mix	tonnes
955870	Dense graded asphalt pavement, 20 mm mix	tonnes
955890	Dense graded asphalt pavement, 40 mm mix	tonnes
955040	Dense graded asphalt pavement, DG7 mix	tonnes
955050	Dense graded asphalt pavement, DG10 mix	tonnes
955060	Dense graded asphalt pavement, DG14 mix	tonnes

Item	Description	Units of Measurement
955070	Dense graded asphalt pavement, DG20 mix	tonnes
955080	Dense graded asphalt pavement, DG28 mix	tonnes
955150	Low rut dense graded asphalt pavement, DG10 mix	tonnes
955160	Low rut dense graded asphalt pavement, DG14 mix	tonnes
955170	Low rut dense graded asphalt pavement, DG20 mix	tonnes
	Establishment / disestablishment of paver and paving gang at paving site	Each

### Testing Requirements

Minimum Test Frequency	
<b>Asphalt / Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	< 200 t / Source / Year – 2 / Source / Year > 200 t / Source / Year – 4 / Source / Year
Asphalt Temperature at Time of Rolling Commencement	6 / Lot minimum
<b>Asphalt Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t
Flakiness Index AS 1141.15	1 / 400 t
Polished Aggregate Friction Value AS 1141.42 and AS 1141.40	1 / Source / 6 months
<b>Geometrics</b>	
Horizontal Q712	1 / 50 m
Vertical – Height or Thickness	1 / 20 m
Vertical – Straightedge Q712	1 / 20 m
Vertical – Surface Evenness Q708B	1 / 100 m
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Heater-planer

Paver

Vibrating steel drum roller

Multi-tyred roller

Asphalt / premix trucks

Loader

### **Materials**

Dense graded / open graded asphalt to MRTS30 *Asphalt Pavements*

TRPMs / paint

### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Operators                        4

Truck drivers

Traffic controllers            2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. If crocodile cracking is adjacent to the affected area, schedule another Activity to repair it.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Define the area for recycling.
7. Note if road marking will be required. Schedule another Activity.
8. Arrange for testing materials, and
9. Specify the appropriate plant, materials and crew (including quantities of material) and organise these.

## WORK PROCEDURES

### Sequential Steps and Check Points

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. this may be marked out already.
3. Prepare the work area:
  - a. offset the existing centre / edge markings, and
  - b. remove existing Raised Retroflective Pavement Markers (RRPMs).
4. Sweep the marked area:
  - a. a clean dust-free surface.
5. Heat and remove existing asphalt, add new asphalt and spread:
  - a. control depth of removal and quantity of new asphalt added, and
  - b. loose depth should be 1.25 times compacted depth.
6. Compact asphalt:
  - a. compact edges first
  - b. use vibrating steel-drum roller, and
  - c. compact at specified temperature.
7. Finish with multi-tyred roller.
8. Check the work against the Restoration Standards.
9. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
10. Re-establish line marking:
  - a. use TRPMs or spotting.
11. Remove traffic control:
  - a. clean / repair, as necessary.

**161 Profile Planing****Description**

The planing back of asphaltic concrete roadway surface profile to sound material or specified depth. Does not include replacement with new asphaltic concrete material.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
SS	Cold Planing Pavements

**Restoration Standards**

The length and width shall be not less than nor exceed by 150 mm that specified. The depth of cut shall be in the range specified.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
161	Profile Planing	m <sup>2</sup>

**Testing Requirements**

Nil.

**WORK PREPARATION****Plant Requirements**

Job truck

Water truck

Road profiler

Trucks

Loader

Rotary broom and/or suction sweeper

**Materials**

Water

TRPMs / paint

**Manpower Requirements**

Leading hand 1

Labourers 2

Operators 4

Truck drivers

Traffic controllers 2

### **Average Daily Production**

Not specified.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Mark out the area for repair.
6. Note if road marking will be required. Schedule another Activity.
7. Check for services, e.g. overhead wires, manholes, other service covers and traffic detector loops. Mark these, as appropriate.
8. Consider subcontracting options.
9. Specify the appropriate plant, materials and crew (including quantities of material) and organise these, and
10. Arrange and specify a disposal area for material removed from pavement.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. this may be marked out already.
3. Profile the work area:
  - a. keep dust down
  - b. control depth of cut to achieve desired road profile, and
  - c. hand excavate around service covers.
4. Remove cut material to disposal site.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. sweep site.

7. Re-establish line marking:
  - a. use TRPMs or spotting.
8. Remove traffic control:
  - a. clean / repair, as necessary.

### **169 Other Pavement Work (inform Element Leader)**

#### **Description**

Any work on the bituminous sealed roadway pavement not covered by other Activities. This Activity is to be used only after informing the Element Leader.

#### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
169	Other Pavement Work (inform Element Leader)	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### **170 Pavement Repairs (RAMC only)**

Details to be advised.

### **171 Edge Repair (Manual)**

Details to be advised.

### **172 Edge Repairs with Emulsion / Aggregate**

Details to be advised.

### **173 Pothole Patching**

Details to be advised.

### **174 Pothole Patching with Emulsion / Aggregate**

Details to be advised.

### **175 Heavy Patching**

Details to be advised.

### **176 Crack Filling**

Details to be advised.

### **177 Crack Treatment with Emulsion / Aggregate**

Details to be advised.

### **178 Crack Treatment with Strain Alleviating Product**

Details to be advised.

### **179 Surface Strip Treatment of Cracks**

Details to be advised.

**180 Rut Correction**

Details to be advised.

**181 Other Bituminous Surface Work**

Details to be advised.

**182 Pavement Repairs**

Details to be advised.

**183 Subgrade Treatment with Pavement Repair Activity**

Details to be advised.

**184 Scarify and Reshape Existing Pavement**

Details to be advised.

**185 Pavement Repairs, Gravel**

Details to be advised.

**186 Gravel Supply (Supply and Cartage)**

Details to be advised.

**187 Other Pavement Work (inform Element Leader)**

Details to be advised.

**200 UNSEALED SURFACES**

**201 Light Formation Grading**

**Description**

The light trimming by grader of unsealed formation surface to restore rideability.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the removal and reinstatement of roadside furniture (e.g. guide posts, signs etc), as required
- the light trimming by grader of the existing roadway to fill holes and other depressions
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.



**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Restoration Standards**

The formation shall be graded to fill holes and depressions and smooth loose material.

Minimal loose material shall be left in drains or around roadside furniture.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
201	Light Formation Grading	km – m Width

**Testing Requirements**

Visual inspections to ensure the Restoration Standards are met.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?
5. Check that no degrading of compaction is required. If it is, schedule a more appropriate Activity, such as Medium Formation Grading (Activity Number 202).
6. Check profile and depth of depressions to ensure no scarifying and addition of imported gravel / material is required in isolated areas.
7. Check that no treatment of adjacent drainage is required. If either is, schedule a more appropriate Activity, such as Heavy Formation Grading (Activity Number 203).
8. Specify and organise appropriate plant, materials and crew (including quantities of material), and
9. Arrange and specify a disposal area for any excavated material.

**202 Medium Formation Grading****Description**

The grading of unsealed formation to reinstate the correct profile. Include the degrading, incorporation of water and compaction. Does not include scarifying or addition of imported gravel / material from outside the work site to build up existing material.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control

- determination of the work area
- the removal and reinstatement of roadside furniture (e.g. guide posts, signs etc), as required
- the degrassing of the existing pavement
- the grading of the existing pavement, including watering and compaction
- the trimming and rolling to correct profile of the compacted formation
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

### Restoration Standards

The formation crossfall measured using the grader blade or other means shall be within 4% to 6%. Superelevation on curves shall also be 4% to 6%. No water shall pond on the surface. The graded surface shall be watered and rolled to provide a sound, tight surface with minimal loose stones and no visible vertical movement.

The cross section shall be visually uniform to that shown on the Work Order.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
202	Medium Formation Grading	km

### Testing Requirements

Minimum Test Frequency	
Crossfall	1 / 50 m

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?

5. Check profile and depth of depressions to ensure no scarifying and addition of imported gravel / material is required in isolated areas. Check that no treatment of adjacent drainage is required. If either is, schedule Heavy Formation Grading (Activity Number 203).
6. Check quality and depth of material to ensure no extra material is required. If it is, schedule Resheeting (Activity Number 205).
7. Specify and organise appropriate plant, materials and crew (including quantities of material), and
8. Arrange and specify a disposal area for excavated material.

### **203 Heavy Formation Grading**

#### **Description**

The grading of unsealed formation to reinstate the correct profile to ensure drainage of the pavement and shoulders and to provide a suitable running course may include the addition of imported gravel / material (refer Activity Number 204) in areas where the gravel crust is broken or where there is change in surface composition. This Activity also includes the treatment of the adjacent surface drainage.

#### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the removal and reinstatement of roadside furniture (e.g. guide posts, signs etc), as required
- the degrading and tining of the existing pavement, the incorporation of gravel (supplied to the work site under Activity Number 204 or won from site - displaced) and water, mixing, compaction and trimming of the pavement material
- the trimming and rolling to shape the compacted formation surface
- the cleaning and reshaping of adjacent surface drainage lines
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>

### Restoration Standards

The formation crossfall measured using the grader blade or other means shall be within 4% to 6%. Superelevation on curves shall also be 4% to 6%. No water shall pond on the surface. The graded surface shall be watered and rolled to provide a sound, tight surface with minimal loose stones and no visible vertical movement.

The restored layer shall have a minimum depth of 75 mm.

The cross section shall be visually uniform to that shown on the Work Order.

The Restoration Standards of the adjacent surface drainage shall be the same as per Activity Number 305.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
203	Heavy Formation Grading	km

### Testing Requirements

Minimum Test Frequency	
Crossfall	1 / 50 m

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?
5. Define area for repair
6. Determine if any areas are of inadequate quality and, if necessary, schedule removal and replacement as per Activity Number 206, and
7. Specify and organise appropriate plant, materials and crew (including quantities of material).

### 204 Gravel / Material Supply – Heavy Formation Grading

#### Description

The supply to the work site of gravel / material that may be required to reinstate the correct profile and level when carrying out Activity Number 203.

#### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- all operations involved with winning, loading and cartage of the gravel / material to the job site
- the provision of traffic control for quarrying, cartage and delivery operations

- all other operations included in the Applicable Specifications, and
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS05	<i>Unbound Pavements</i>
SS	Unsealed Formation Gravel

#### Restoration Standards

Nil. Supply only.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
204	Gravel / Material Supply – Heavy Formation Grading	m <sup>3</sup> (loose)

#### Testing Requirements

Minimum Test Frequency	
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
CBR Q113A	1 / Source / Year

#### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains?
4. Is an alternative remedy of major maintenance more appropriate?
5. Mark out the area that requires additional gravel, and
6. Specify and organise appropriate plant, materials and area (including quantities of material).

#### 205 Formation Resheeting – Minor (> 150 m)

##### Description

The addition of imported gravel / material to the running surface to reinstate to the correct profile / height above the natural surface, improve the quality of the surface material or to obtain an acceptable running course depth. Includes de-grassing, scarifying and preparation of the existing formation and the incorporation of water and proper compaction of the formation and imported gravel / material.

## Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the removal and re-instatement of roadside furniture (e.g. guide posts, signs etc), as required
- the de-grassing and preparation of the existing pavement, the incorporation of gravel and water, mixing compaction and trimming of the pavement material
- the trimming and rolling to shape of the compacted re-sheeted formation
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>

All grass and other vegetation shall be removed from the work area and disposed of in an approved manner. The existing formation material shall be shaped to form a surface parallel to the planed finished surface of the shoulder. This surface shall be wide enough to enable the completed formation to conform to the cross-section shape specified on the Work Order.

Where the reformed surface is greater than 75 mm below the planed finished surface, the surface shall be watered and compacted to a firm condition with no visible vertical movement under the compaction equipment before material is added.

Where the reformed surface is less than 75 mm below the planed finished surface, the surface shall be scarified to a depth of 75 mm below the planed finished surface and watered to enable compaction after new material has been added.

### Restoration Standards

The formation crossfall measured using the grader blade or other means shall be within 4% to 6%. Superelevation around curves shall also be 4% to 6%. No water shall pond on the surface. The graded surface shall be watered and rolled to provide a sound, tight surface with minimal loose stones and no visible vertical movement.

The cross section shall be visually uniform to that shown on the Work Order.

The restored pavement layer shall be a minimum depth of 75 mm.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
205	Formation Resheeting – Minor (> 150 m)	m <sup>3</sup>

#### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
	Scarify, shape and compact existing material	m <sup>2</sup>
	Base, unbound pavement type	m <sup>3</sup>

#### Testing Requirements

Minimum Test Frequency	
Crossfall	1 / 50 m

#### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?
5. Define area for repair.
6. Determine if any areas are of inadequate quality and, if necessary, schedule removal and replacement as per Activity Number 206, and
7. Specify and organise appropriate plant, materials and crew (including quantities of material).

#### 206 Remove Formation Material and Replace, if required

##### Description

The removal of unsuitable formation material and the reinstatement to correct profile. May include the actual replacement of the existing formation material.

##### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the removal and re-instatement of roadside furniture (e.g. guide posts, signs etc), as required
- the de-grassing of the existing formation and the removal from the work area to a specified site of unsuitable formation material

- the incorporation of replacement gravel, the incorporation of gravel and water, mixing, compaction and trimming of the pavement material
- the trimming and rolling to shape of the compacted formation
- the cleaning and reshaping of adjacent surface drainage
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>

All grass and other vegetation shall be removed from the work area and disposed of in an approved manner.

Unsuitable formation material shall be removed as designated on the Work Order, and the existing formation material shall be shaped to form a surface parallel to the planned finished surface of the formation. This surface shall be wide enough to enable the completed formation to conform to the cross-section shape specified on the Work Order.

Where no additional material is to be added or the reformed surface is greater than 75 mm below the planned finished surface, the surface shall be watered and compacted to a firm condition with no visible vertical movement under the compaction equipment before material is added.

Where the reformed surface is less than 75 mm below the planned finished surface and additional material is to be incorporated into the surface, it shall be scarified to a depth of 75 mm below the planned finished surface and watered to enable compaction after new material has been added.

Additional material shall be added to the surface or incorporated into it, when shown on the Work Order.

### Restoration Standards

The formation crossfall measured using the grader blade or other means shall be 4% to 6%. Super elevation on curves shall also be 4% to 6%. No water shall pond on the surface. The graded surface shall be watered and rolled to provide a sound tight surface with minimal loose stones and no visible vertical movement. The cross-section shape shall be visually uniform to that shown on the Work Order.

The restored pavement layer shall be a minimum depth of 75 mm.



**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
206	Remove Formation Material and Replace, if required	m <sup>3</sup> (loose)

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
	Scarify, shape and compact existing material	m <sup>2</sup>
	Base, unbound pavement type	m <sup>3</sup>

**Testing Requirements**

As per Applicable Specifications listed.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?
5. Define for repair, areas of inadequate quality, and
6. Specify and organise appropriate plant, materials and crew (including quantities of material).

**207 Formation Mechanical Stabilisation – Minor (> 150 m)****Description**

The addition of selected imported gravel / material to existing formation material to improve the mechanical stability of the material. Includes winning, loading and cartage of imported gravel / material, de-grassing, scarifying and preparation of the existing formation, the incorporation of water and the proper mixing and compaction of the mechanically stabilised formation material.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
207	Formation Mechanical Stabilisation – Minor (> 150 m)	m <sup>3</sup> (loose) / Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**208 Accessibility Grading****Description**

The light trimming by grader of unsealed formation material to restore access for light vehicles.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Restoration Standards**

The formation shall be graded to fill holes and depressions and smooth loose material.

The surface shall be trafficable for light vehicles.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
208	Accessibility Grading	km – m Width

**Testing Requirements**

None listed.

**WORK PREPARATION****Plant Requirements**

Job truck

Grader

**Materials**

None detailed.

**Manpower Requirements**

Leading hand 1

Operators 2

Traffic controllers 2

**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Is an alternative remedy or major maintenance more appropriate, and
3. Specify and organise appropriate plant, materials and crew (including quantities of material).

**WORK PROCEDURES****Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.

2. Determine the work area:
  - a. from supervisor's instructions, and
  - b. remove guide posts and other roadside furniture, if needed.
3. Grade the work area to width specified:
  - a. fill holes and depressions, and
  - b. avoid loss of material from the formation.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. no material to block drains, and
  - b. ensure vegetation is not blocking drainage.
6. Replace roadside furniture.
7. Remove traffic control:
  - a. clean / repair, as necessary.

#### **214 Other Formation Work**

##### **Description**

Any work on unsealed roadway formation not covered by Activity Numbers 201, 202, 203, 204, 205, 206, 207, 208, 230 and 231.

##### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
214	Other Formation Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

#### **215 Light Shoulder Grading – Rural**

##### **Description**

The grading of unsealed shoulders located in a rural environment (greater than 60 kph speed restriction) to remove vegetation. Includes the removal of any windrows of vegetation and other debris that may otherwise impede drainage or encourage scour.

##### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- determine the restoration width for the shoulder
- the removal and reinstatement of roadside furniture (e.g. guide posts, signs etc), as required

- the removal of the material from the shoulder to enable drainage of the pavement and shoulder to the table drain or other appropriate collection point
- the watering and compaction of the surface, if required
- brooming of the sealed surface to remove any loose material, if required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

### Restoration Standards

At the sealed / unsealed interface, the finished unsealed surface shall be even and within + 0, - 10 mm of the height of the adjacent seal. Shoulder crossfall measured using the grader blade or other means shall be within + 0, -2% (absolute) when compared to the crossfall of the adjacent sealed pavement.

#### Note:

Where the crossfall of adjacent sealed pavement is so irregular that the + 0, - 2% (absolute) standard cannot be achieved, the crossfall on the finished unsealed surface shall be consistent with allowing the free drainage of water off the sealed pavement.

The graded surface shall be watered and rolled to provide a sound tight surface. No loose material shall be left on the sealed carriageway, in drains or around roadside furniture.

The surface of the sealed carriageway shall not be damaged during the Work Operations.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
215	Light Shoulder Grading – Rural	Shoulder km Side

### Testing Requirements

Minimum Test Frequency	
Crossfall	1 / 500 m maximum on straights Guide post frequency maximum around curves

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?
5. Check shoulder build-up and vegetation growth to determine if truck and loader are needed to remove material.
6. Specify and organise appropriate plant, materials and crew (including quantities of material), and
7. Arrange and specify a disposal area for excavated material.

### **216 Heavy Shoulder Grading – Rural**

#### **Description**

The grading of unsealed shoulders located in a rural environment (greater than 60 km / hr speed restriction) to reinstate the correct profile.

#### **Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and material
- establishment and disestablishment of traffic control
- determination of the work area
- determination of the restoration width for the shoulder
- the removal and re-instatement of roadside furniture (e.g. guide posts, signs etc), as required
- the de-grassing and tyning of the existing shoulder (including widening of any suitable material on-site adjacent to the width of the shoulder to be maintained), the incorporation of gravel (supplied to the work site under Activity Number 219 or won from site) and watering, mixing, compaction and trimming of the shoulder material
- brooming of the sealed surface to remove any loose material
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
SS	Selected Shoulder Gravel

**Restoration Standards**

At the sealed / unsealed interface, the finished unsealed surface shall be even and within + 0, - 10 mm of the height of the adjacent seal. Shoulder crossfall measured using the grader blade or other means shall be within + 0, -2% (absolute) when compared to the crossfall of the adjacent sealed pavement.

**Note:**

Where the crossfall of adjacent sealed pavement is so irregular that the + 0, - 2% (absolute) standard cannot be achieved, the crossfall on the finished unsealed surface shall be consistent with allowing the free drainage of water off the sealed pavement.

In general, the width of the finished shoulder shall not exceed:

- 3 m where seal width is less than 4.5 m
- 2 m where seal width is between 4.5 and 5.6 m, and
- 1.5 m where seal width is greater than 5.6 m.

See "Notes on Finished Cross-Sections" below.

The graded surface shall be watered and rolled to provide a sound tight surface. No loose material shall be left on the sealed carriageway, in drains or around roadside furniture.

The surface of the sealed carriageway shall not be damaged.

**Notes on Finished Cross-Sections**

Prior to commencement of work, the Contractor's maintenance supervisor shall nominate the finished width (or widths) of shoulder for each sub-section to be graded.

Where the width of the existing shoulder is greater than the widths specified previously under this section, the following shall apply:

- the specified crossfall for the finished shoulders shall be provided only for the width specified previously under this section, and
- suitable material which may exist outside the required shoulder width, and which is winnable, should be considered for use for shoulder resheeting before additional material is brought to the site.

Bus put off areas or widened shoulders at intersections and turnouts are not to be reduced in width.

Where the width of the existing shoulder being graded is less than the width specified previously under this section, the width of the existing shoulder need not be increased to the width given, except where this will be done at no additional cost to the Principal.

Overall, finished shoulder width shall be constant and within + 300 mm / - 100 mm of the width nominated by the supervisor on the Work Order.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
216	Heavy Shoulder Grading – Rural	Shoulder km side

**Testing Requirements**

Minimum Test Frequency	
Crossfall	1 / 50 m maximum on straights Guide post frequency maximum around curves

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?
5. Define area for repair.
6. Determine if any areas are of inadequate quality and, if necessary, schedule removal and replacement as per Activity Number 222, and
7. Specify and organise appropriate plant, materials and crew (including quantities of material).

**217 Light Shoulder Grading – Urban****Description**

The grading of unsealed shoulders located in an urban environment to remove vegetation. Includes the removal of any windrows of vegetation and other debris that may otherwise impede drainage or encourage scour.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
SS	Selected Shoulder Gravel

**Restoration Standards**

At the sealed / unsealed interface, the finished unsealed surface shall be even and within + 0, - 10 mm of the height of the adjacent seal. Shoulder crossfall measured using the grader blade or other means shall be within + 0, - 2% (absolute) when compared to the crossfall of the adjacent sealed pavement.

The graded surface shall be watered and rolled to provide a sound tight surface. No loose material shall be left on the sealed carriageway, in drains or around roadside furniture.

The surface of the sealed carriageway shall not be damaged during the Work Operations.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
217	Light Shoulder Grading – Urban	m <sup>2</sup>

**Testing Requirements**

Minimum Test Frequency	
Crossfall	1 / 50 m

**WORK PREPARATION****Plant Requirements**

Job truck

Grader

Truck and loader

**Materials**

Not listed.

**Manpower Requirements**

Leading hand 1

Operators 2

Truck drivers

Traffic controllers 2

**Average Daily Production**

Not detailed.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?
5. Check shoulder build-up and vegetation growth to determine if truck and loader are needed to remove material.
6. Specify and organise appropriate plant, materials and crew (including quantities of material), and
7. Arrange and specify a disposal area for excavated material.



## WORK PROCEDURES

### Sequential Steps and Check Points

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions, and
  - b. remove guide posts and other roadside furniture, if needed.
3. Remove vegetation from the work area:
  - a. cut with grader
  - b. avoid damaging seal
  - c. avoid spreading material on seal, and
  - d. remove to site specified by your supervisor.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains
  - c. sweep sealed surface, and
  - d. ensure vegetation is not blocking drainage.
6. Replace roadside furniture.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### **218 Heavy Shoulder Grading – Urban**

#### **Description**

The grading of unsealed shoulders located in an urban environment to reinstate the correct profile.

This Activity includes:

1. where necessary, removal and reinstatement of guideposts and signs
2. tyning of the existing shoulder
3. incorporation of gravel (Activity Number 219) and water
4. compaction of the shoulder material, and
5. brooming of the sealed surface to remove any loose material.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
SS	Selected Shoulder Gravel

**Restoration Standards**

At the sealed / unsealed interface, the finished unsealed surface shall be even and within + 0, - 10 mm of the height of the adjacent seal.

Shoulder crossfall measured using the grader blade or other means shall be within + 0, - 2% (absolute) when compared to the crossfall of the adjacent sealed pavement.

The graded surface shall be watered and rolled to provide a sound tight surface. No loose material shall be left on the sealed carriageway, in drains or around roadwork furniture.

The surface of the sealed carriageway shall not be damaged.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
218	Heavy Shoulder Grading – Urban	m <sup>2</sup>

**Testing Requirements**

Minimum Test Frequency	
Crossfall	1 / 50 m

**WORK PREPARATION****Plant Requirements**

Job truck

Grader

Truck and loader

**Materials**

Note: Selected shoulder material to Supplementary Specification supplied under Activity Number 148.

**Manpower Requirements**

Leading hand 1

Operators 2

Truck drivers

Traffic controllers 2

**Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?
5. Define area for repair.
6. Determine if any areas are of inadequate quality and, if necessary, schedule removal and replacement as per Activity Number 222.
7. Specify and organise appropriate plant, materials and crew (including quantities of material), and
8. Arrange and specify a disposal area for excavated material.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions, and
  - b. remove guide posts and other roadside furniture, if needed.
3. Remove vegetation from the work area:
  - a. cut with grader
  - b. avoid damaging seal
  - c. avoid spreading material on seal, and
  - d. remove to site specified by your supervisor.
4. Fill depressions:
  - a. tyne with grader
  - b. mix segregated material with grader
  - c. moisten, if needed, and
  - d. blade to shape.
5. Compact shoulder:
  - a. keep smooth drum roller off edge of existing seal.

6. Trim and roll to shape:
  - a. use steel drum roller
  - b. finish with multi-tyred roller, and
  - c. constant width.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains
  - c. sweep sealed surface, and
  - d. ensure vegetation is not blocking drainage.
9. Replace roadside furniture.
10. Remove traffic control:
  - a. clean / repair, as necessary.

## 219 Gravel Supply – Heavy Shoulder Grading

### Description

The supply on-site of imported gravel that may be required to reinstate the correct profile and/or level when carrying out Activity Numbers 216 or 218.

### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control (specific to the quarrying, cartage and delivery operations)
- all operations required for the supply of the material (e.g. winning, loading and carting to the required location)
- all other operations in the Applicable Specifications, and
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS05	<i>Unbound Pavements</i>
SS	Shoulder Gravel

**Restoration Standards**

Nil. Supply only.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
219	Gravel Supply – Heavy Shoulder Grading	m <sup>3</sup> (loose)

**Testing Requirements**

Minimum Test Frequency	
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
CBR Q113A	1 / Source / Year

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains?
4. Is an alternative remedy of major maintenance more appropriate?
5. Mark out the area that requires additional gravel, and
6. Specify and organise appropriate plant, materials and area (including quantities of material).

**220 Shoulder Pothole Patching****Description**

The manual placement and compaction of gravel into isolated potholes in a gravel shoulder.

This Activity would normally be undertaken as a temporary measure to make a road shoulder safe until Activity Numbers 216 or 218 (Heavy Shoulder Grading) can be scheduled. It may also be used to prolong the life of a gravel shoulder, delaying the need for more expensive and extensive treatment.

**Work Operations**

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- preparation of the work area - the removal of any loose material or water ponding in the hole

- the supply, placement and compaction (by hand equipment) of gravel (at an appropriate water content) into the failed area
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
SS	Selected Shoulder Gravel

### Restoration Standards

The finished surface of the gravel placed in the pothole shall be within  $\pm 20$  mm of the surrounding gravel.

The gravel patch shall be compacted to provide a sound, tight patch.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
220	Shoulder Pothole Patching	m <sup>3</sup> (loose)

### Testing Requirements

Minimum Test Frequency	
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
CBR Q113A	1 / Source / Year

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Are there any related defects, e.g. blocked table drains, missing guide posts?
3. Is an alternative remedy or major maintenance more appropriate? For example, extensively potholed shoulder should be graded.

4. Define the area for repair, and
5. Specify and organise appropriate plant, materials and crew (including quantities of material).

## 221 Shoulder Resheeting

### Description

The addition of material to unsealed shoulders to correct excess shoulder crossfall, drop off and/or reduced shoulder width. This allows for the cartage of water and gravel / material up to a lead of 20 km.

### Work Operations

The following operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant, labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- determination of the restoration width for the shoulder
- the removal and re-instatement of roadside furniture (e.g. guide posts, signs etc), as required
- the removal of vegetation and debris on work area
- add new shoulder material, tyne into existing material, mix, moisten and blade to shape
- compact, trim and roll to shape and crossfall specified on the Work Order
- brooming of the sealed surface to remove any loose material, if required
- all other operations in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to these Work Operations is required, the following Applicable Specifications provide additional requirements for compliance.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>

All grass and other vegetation shall be removed from the work area and disposed of in an approved manner.

The existing shoulder material shall be shaped to form a surface parallel to the planned finished surface of the shoulder. This surface shall be wide enough to enable the completed shoulder to conform to the cross-section shape specified on the Work Order.

Where the reformed surface is greater than 75 mm below the planned finished surface, the surface shall be watered and compacted to a firm condition with no visible vertical movement under the compaction equipment before additional material is added.

Where the reformed surface is less than 75 mm below the planned finished surface, the surface shall be scarified to a depth of 75 mm below the planned finished surface and watered to enable compaction after new material has been added.

### Restoration Standards

At the sealed / unsealed interface, the finished unsealed surface shall be within + 0, - 10 mm of the height of the adjacent seal. Shoulder crossfall measured using the grader blade or other means shall be within + 0, - 2% (absolute) when compared to the crossfall of the adjacent sealed pavement.

#### Note:

Where the crossfall of adjacent sealed pavement is so irregular that the + 0, - 2% (absolute) standard cannot be achieved, the crossfall on the finished unsealed surface shall be consistent with allowing the free drainage of water off the sealed pavement.

The finished shoulder shall have a sound tight surface with no visible vertical movement under the final passes of the compaction equipment. No loose material shall be left on the sealed carriageway, in drains or around roadside furniture.

The surface of the sealed carriageway shall not be damaged during the Work Operations.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
221	Shoulder Resheeting	m <sup>3</sup> (loose)

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
	Scarify, shape and compact existing material	m <sup>2</sup>
	Base, unbound pavement type (subtype)	m <sup>3</sup>

### Testing Requirements

Minimum Test Frequency	
Crossfall	1 / 50 m
Particle Size Distribution (Grading) Q103A	1 / 250 m <sup>3</sup>
Linear Shrinkage Q106	1 / 250 m <sup>3</sup>
CBR Q113A	1 / Source / Year

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.



### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy more appropriate?
5. Define area for repair.
6. Determine if any areas are of inadequate quality and, if necessary, schedule removal and replacement as per Activity Number 222, and
7. Specify and organise appropriate plant, materials and crew (including quantities of material).

### 222 Remove Shoulder Material and Replace, if required

#### Description

The removal of unsuitable shoulder material, and the reinstatement to the correct profile. This may include the replacement of the existing shoulder material. This allows for the cartage of water and gravel / material up to a lead of 20 km.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>

All grass and other vegetation shall be removed from the work area and disposed of in an approved manner.

Unsuitable shoulder material shall be removed as designated on the Work Order, and the existing shoulder material shall be shaped to form a surface parallel to the planned finished surface of the shoulder. This surface shall be wide enough to enable the completed shoulder to conform to the cross-section shape specified on the Work Order.

Where the reformed surface is greater than 75 mm below the planned finished surface, the surface shall be watered and compacted to a firm condition with no visible vertical movement under the compaction equipment before material is added.

Where the reformed surface is less than 75 mm below the planned finished surface, the surface shall be scarified to a depth of 75 mm below the planned finished surface and watered to enable compaction after new material has been added.

#### Restoration Standards

At the sealed / unsealed interface, the finished unsealed surface shall be within + 0, - 10 mm of the height of the adjacent seal. Shoulder crossfall measured using the grader blade or other means shall be within + 0, - 2% (absolute) when compared to the crossfall of the adjacent sealed pavement.

**Note:**

Where the crossfall of adjacent sealed pavement is so irregular that the + 0, - 2% (absolute) standard cannot be achieved, the crossfall on the finished unsealed surface shall be consistent with allowing the free drainage of water off the sealed pavement.

The finished shoulder shall have a sound tight surface with no visible vertical movement under the final passes of the compaction equipment. No loose material shall be left on the sealed carriageway.

The surface of the sealed carriageway shall not be damaged during the Work Operations.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
222	Remove Shoulder Material and Replace, if required	m <sup>3</sup> (loose)

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
	Scarify, shape and compact existing material	m <sup>2</sup>
	Base, unbound pavement type (subtype)	m <sup>3</sup>

**Testing Requirements**

Minimum Test Frequency	
Crossfall	1 / 50 m

**WORK PREPARATION****Plant Requirements**

Job truck

Water tanker

Grader

Multi-tyred roller

Steel drum roller

Rotary broom

Trucks

Loader

**Material**

Unbound pavement selected material to MRTS05 *Unbound Pavements*.

### **Manpower Requirements**

Leading hand 1

Operators 4

Truck drivers

Traffic controllers 2

### **Average Daily Production**

300 m<sup>3</sup>

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. blocked table drains, missing guide posts?
4. Is an alternative remedy or major maintenance more appropriate?
5. Define for repair, areas of inadequate quality, and
6. Specify and organise appropriate plant, materials and crew (including quantities of material).

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions, and
  - b. remove guide posts and other roadside furniture, if needed.
3. Remove from the work area, shoulder material required to be replaced:
  - a. cut with grader
  - b. avoid damaging seal
  - c. avoid spreading material on seal, and
  - d. remove to site specified by your supervisor.

4. Add material:
  - a. tyne with grader
  - b. mix segregated material with grader
  - c. moisten, if needed, and
  - d. blade to shape.
5. Compact shoulder:
  - a. keep smooth drum roller off edge of existing seal.
6. Trim and roll to shape:
  - a. use steel drum roller
  - b. finish with multi-tyred roller, and
  - c. constant width.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains
  - c. sweep sealed surface
  - d. water sealed surface to reduce dust hazard, if appropriate, and
  - e. ensure vegetation is not blocking drainage.
9. Replace roadside furniture.
10. Remove traffic control:
  - a. clean / repair, as necessary.

### **229 Other Unsealed Shoulder Work**

#### **Description**

Any work on unsealed shoulders not covered by Activity Numbers 215, 216, 217, 218, 219, 220, 221, 222, 230 and 231.

#### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
229	Other Unsealed Shoulder Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### **230 Abnormal Water Cartage**

#### **Description**

The cartage of water over lead distances greater than the nominated maximum limit for normal cartage of 20 km. Applies to works carried out under Activity Numbers 202, 203, 205, 216 and 221.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
230	Abnormal Water Cartage	ml / km

No other details are included in the Maintenance Activity Standard for this Activity.

**231 Abnormal Gravel Cartage****Description**

The cartage of gravel over lead distances greater than the nominated maximum limit for normal cartage of 20 km applies to works carried out under Activity Numbers 221 and 205.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
231	Abnormal Gravel Cartage	m <sup>3</sup> (loose) / km

No other details are included in the Maintenance Activity Standard for this Activity.

**300 DRAINAGE****301 Install Earth Surface Drains****Description**

All work and materials associated with the installation of new, or the improvement of existing, earth surface drains. Includes diversion, catch, batter and table drain work. Does not include work associated with the installation of new drainage structures. See Activity Number 320. Includes, where necessary, removal and replacement of guide posts and signs.

This Activity excludes non-rippable material. Non-rippable material shall be material which cannot be ripped at a production rate exceeding the rate in the following Table listed against the particular class of excavator.

Class of Excavator	Metres / Hour
> 20 – 25 tonnes	50
> 16 – 20 tonnes	30
> 2 – 4.5 tonnes	10

Rippable material shall be all material other than non-rippable material. Proving material to be non-rippable shall be the Contractor's responsibility. The excavator employed shall be equipped with a bucket to manufacturer's specified standard capacity and fitted with rock teeth.

**Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area

- the removal and reinstatement of roadside furniture (e.g. guide posts, signs etc), as required
- the installation of the new drain to the specified Restoration Standards, including the excavation and removal of all necessary material
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirement for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>

#### Restoration Standards

It is recognised in some cases where a shoulder has insufficient width (which cannot be corrected because of physical constraints), it is desirable to lessen the restoration depth and/or batter slope to ensure the drain itself remains trafficable (i.e. 600 mm wide, 150 mm deep, batter slope 1 on 4).

In this instance, the installation of the drains should be undertaken to a standard that does not lessen the trafficable surface which is currently available to the road users (i.e. the existing shoulder and/or trafficable drain batter should remain trafficable). The motorists should not perceive that the trafficable width has altered.

The drain shall be free of all material that could block the flow of water into the drain and along it.

The base shall be evenly sloped to allow water to flow to the outlet.

The base of the drain shall be at least 450 mm below the edge of the road shoulder (for earth table drains).

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
301	Install Earth Surface Drains	Metres

#### Testing Requirements

Minimum Test Frequency	
Drain Cross Section	1 / 50 m

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the length of drain requiring excavation.
6. Check for services, e.g. overhead wires and buried services. Mark these, as appropriate.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.
8. Arrange and specify a disposal area for excavated material, and
9. Check drain during or immediately after next rainfall.

### 302 Repair Earth Surface Drains

#### Description

The repair to correct profile and level of damaged earth surface drains.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
301	Repair Earth Surface Drains	Metres

No other details are included in the Maintenance Activity Standard for this Activity.

### 303 Install Concrete Surface Drains

#### Description

All work and materials associated with the installation of new, or the improvement of existing, concrete surface drains. Includes diversion, catch, batter and table drain work. Does not include work associated with the installation of new drainage structures. See Activity Number 320.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>

#### Restoration Standards

The drain cross section shall conform to the design requirements detailed on the Work Order.

The base shall be evenly sloped to allow water to flow to the outlet.

The base of the drain shall be at least 450 mm below the edge of the road shoulder (for earth table drains).

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
303	Install Concrete Surface Drains	Metres

#### Testing Requirements

Minimum Test Frequency	
Drain Cross Section	1 / 50 m

### WORK PREPARATION

#### Plant Requirements

Job truck

Trucks

Excavator / bobcat / backhoe / gradall / grader

Loader

Rotary broom

Water tanker

#### Materials

Concrete as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*.

#### Manpower Requirements

Leading hand 1

Labourers 2

Operators

Truck drivers

Traffic controllers 2

#### Average Daily Production

Not listed.

#### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects?



4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the length of drain required.
6. Check for services, e.g. overhead wires and buried services. Mark these, as appropriate.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.
8. Provide cross section and other relevant details of the required drain on the Work Order, and
9. Arrange and specify a disposal area for excavated material.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions, and
  - b. remove guide posts and other roadside furniture, if needed.
3. Excavate for the drain:
  - a. supervisor to mark out (or specify) area to excavated
  - b. supervisor to provide sketch of finished cross section, and
  - c. truck surplus excavated material to site specified by your supervisor.
4. Cast concrete:
  - a. set formwork
  - b. check formwork, and
  - c. place concrete.
5. Check the work against the Restoration Standards:
  - a. make regular checks while you are doing the job
  - b. check to ensure even slope, and
  - c. check depth below shoulder.
6. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains, and
  - c. use rotary broom or water tanker for pavement.

7. Replace roadside furniture.
8. Remove traffic control:
  - a. clean / repair, as necessary.

### 304 Repair Concrete Surface Drains

#### Description

The repair to correct profile and level of damaged concrete surface drains.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
304	Repair Concrete Surface Drains	Metres

No other details are included in the Maintenance Activity Standard for this Activity.

### 305 Clean Earth and Concrete Surface Drains

#### Description

The restoration of existing earth and concrete drains that are ineffective due to insufficient depth or insufficient grade. Does not include work done on drainage lines treated under Activity Number 203.

This Activity includes, where necessary, removal and reinstatement of guide posts and signs.

This Activity excludes non-rippable material. Non-rippable material shall be material which cannot be ripped at a production rate exceeding the rate in the following Table listed against the particular class of excavator.

Class of Excavator	Metres / Hour
> 20 – 25 tonnes	50
> 16 – 20 tonnes	30
> 2 – 4.5 tonnes	10

Rippable material shall be all material other than non-rippable material. Proving material to be non-rippable shall be the Contractor's responsibility. The excavator employed shall be equipped with a bucket to manufacturer's specified standard capacity and fitted with rock teeth.

#### Work Operations

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control

- determination of the work area
- the removal and reinstatement of roadside furniture (e.g. guide posts, signs etc), as required
- the restoration of the drain to the specified standard, including the excavation and removal of all necessary material
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirement for compliance in these areas.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>

The drain shall be constructed to one of the typical types in Figures 6 and 7 of National Association of Australian State Road Authorities (NAASRA) *Guide to Design of Road Surface Drainage*.

It is recognised in some cases where a shoulder has insufficient width (which cannot be corrected because of physical constraints), it is desirable to lessen the restoration depth and/or batter slope to ensure the drain itself remains trafficable (i.e. 600 mm wide, 150 mm deep, batter slope 1 on 4).

In this instance, the installation of the drains should be undertaken to a standard that does not lessen the trafficable surface which is currently available to the road users (i.e. the existing shoulder and/or trafficable drain batter should remain trafficable). The motorists should not perceive that the trafficable width has altered.

### Restoration Standards

The drain shall be free of all material that could block the flow of water into the drain and along it.

The base shall be evenly sloped to allow water to flow to the outlet.

The base of the drain shall be at least 450 mm below the edge of the road shoulder (for earth table drains).

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
305	Clean Earth and Concrete Surface Drains	Metres

### Testing Requirements

Minimum Test Frequency	
Drain Cross Section	1 / 50 m

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. cracked concrete?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the length of drain requiring cleaning or excavation.
6. Check for services, e.g. overhead wires and buried services. Mark these, as appropriate.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.
8. Arrange and specify a disposal area for excavated material, and
9. Check drain during or immediately after next rainfall.

**306 Repair or Replace Concrete Slabs, Paving Blocks, Kerbs and Dykes****Description**

The repair or replacement of concrete or paving blocks, kerbs and dykes.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS70	<i>Concrete</i>

**Restoration Standards**

The concrete or paving blocks and dykes shall be repaired to the standards specified for new work in MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*. All excess material shall be disposed of neatly outside the road reservation.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
306	Repair or Replace Concrete Slabs, Paving Blocks, Kerbs and Dykes	m <sup>2</sup> / Dollars

**Testing Requirements**

Minimum Test Frequency	
Concrete – Slump AS 1012.3.1	< 4 m <sup>3</sup> No requirement
Compressive Strength AS 1012.9	> 4 m <sup>3</sup> as per MRS70
Geometrics	
Specified Tolerances	As per MRTS03
Maximum Lot Size	Work Order

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Bobcat / backhoe / loader

Concrete saw / pavement breaker

### **Materials**

Paving blocks as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Concrete as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Operator                         1

Traffic controllers            2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the area requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.

2. Determine area to be repaired:
  - a. from supervisor's instructions.
3. Repair the slab, paving blocks, kerb or dyke:
  - a. in accordance with details in the specifications and Work Order.MR
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### **310 Installation and Removal of Erosion and Sediment Control Measures – Minor**

#### **Description**

The installation of erosion and sediment control devices, as required, to control the discharge of sediment and turbidity (to table rains, waterways etc) contained within run off from areas of exposed earth for erosion depth up to 300 mm.

#### **Work Operations**

The following Work Operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control, if required
- determination of the work area
- the supply and installation of temporary erosion and sediment control devices to control sediment and turbidity and their removal from site once they are no longer required
- upon removal of the devices, any reusable materials are to be stored for the Principal for later application (e.g. star pickets etc)
- all other operation included in the specifications and approved Environmental Plan (Maintenance)
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspection, compliance and audit testing, and
- the clean up of the site, including the disposal of any waste / collected material in accordance with any State Government legislation of Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS51	<i>Environmental Management</i>
MRTS52	<i>Erosion and Sediment Control</i>

MRTS52 *Erosion and Sediment Control* measures are to be installed to comply with the requirements of the approved Environmental Management Plan (Maintenance).

### Restoration Standards

Installation and removal of MRTS52 *Erosion and Sediment Control* measures shall conform to the requirement of the approved Environmental Management Plan (Maintenance).

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
310	Installation and Removal of Erosion and Sediment Control Measures – Minor	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### Testing Requirements

Nil.

### Particular Planning Points to Consider

- Are the control measures installed to ensure the device is effective?
- Is the sediment fence buried adequately and braced?
- Specify the appropriate plan, material and crew (including quantities of material and organise these), and
- Have the requirements of the Environmental Management Plan (Maintenance) been implemented?

### 311 Maintenance of Erosion and Sediment Control Measures

#### Description

The maintenance of erosion and sediment control devices installed under Activity Number 310, as required, to ensure that the devices are operating in an efficient and effective manner.

#### Work Operations

The following Work Operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control (if required)
- determination of the work area
- the inspection and maintenance of the temporary erosion and sediment control devices, including the removal of any built up material and the repair of any damage to the structures
- all other operation included in the Applicable Specifications and approved Environmental Management Plan (Maintenance)
- all monitoring, testing and reporting of results, and
- The clean up of the site, including the disposal of any waste / collected material in accordance with any State Government legislation of Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS51	<i>Environmental Management</i>
MRTS52	<i>Erosion and Sediment Control</i>

Erosion and Sediment Control Measures are to be installed to comply with the requirements of the approved Environmental Management Plan (Maintenance).

The Contractor shall monitor (including testing and reporting of test results) and inspect installed erosion and sediment control measures after rain events, and at regular intervals during prolonged rain periods. Inspections are also required to monitor for repair of any damage and to remove excessive sediment deposits.

Devices are to be left in place and maintained until their removal will not result in sediment and turbidity discharge greater than the limits specified in the approved Environmental Management Plan (Maintenance)

#### Restoration Standards

Control measures are to be maintained to the Soil Erosion and Sediment Control Guidelines contained in the Environmental Management Plan (Maintenance).

The site shall be left clean and tidy.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
311	Maintenance of Erosion and Sediment Control Measures	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

#### Testing Requirements

Not listed.

#### Particular Planning Points to Consider

- Are the Control Measures installed to ensure the device is effective?
- Specify the appropriate plant, materials and crew (including quantities of material) and organise these.
- Does the device require removal?
- If the erosion and Sediment Control Measures are regularly damaged, back up measures may need to be implemented to maintain the control measure's effectiveness.



- Have the requirements of the Environmental Management Plan (Maintenance) been implemented, and
- Are other Activities programmed for this area? If so, will new control measures need to be installed?

### 312 Service Sedimentation Ponds

#### Description

The works associated with the routine servicing of sedimentation ponds to ensure their planned operation in service is not compromised.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS51	<i>Environmental Management</i>
MRTS52	<i>Erosion and Sediment Control</i>

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
312	Service Sedimentation Ponds	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### 313 Repair Sedimentation Ponds

#### Description

The works associated with the repair of sedimentation ponds to ensure their operation in service is effective.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS51	<i>Environmental Management</i>
MRTS52	<i>Erosion and Sediment Control</i>

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
313	Repair Sedimentation Ponds	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### 319 Other Surface Drain Work

#### Description

The work carried out to earth and concrete surface drains not covered by Activity Numbers 301, 302, 303, 304, 305, 306, 310, 311, 312, 313 and 326.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS51	<i>Environmental Management</i>
MRTS52	<i>Erosion and Sediment Control</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
319	Other Surface Drain Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**320 Replace Minor Culverts and Pipes****Description**

The work associated with the installation of a new culvert and pipe drainage facility. Includes backfilling to profile, bitumen sealing and the provision of associated inlet and outlet drains.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>
SS	District Supplementary Specifications

Plant mix stabilised and hotmixed asphalt pavement material may be placed by any equipment that does not cause the mix to segregate.

**Restoration Standards**

As per specifications.

The finished surface shall be within  $\pm 5$  mm of the height of the surrounding road surface.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
320	Replace Minor Culverts and Pipes	Metres

**Supplementary Work Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
912100	Provision for traffic	Lump Sum
942300	Culvert and/or end structure excavation	m <sup>3</sup>
921100	Supply of concrete pipe culvert components	Lump Sum
921200	Supply of concrete box culvert components	Lump Sum
925100	Installation of concrete pipe components	Metres
925400	Installation of concrete box culvert components	Metres
927200	End structures to culverts, unreinforced concrete	m <sup>3</sup>
	Plant mix stabilised pavement (including cement and curing)	m <sup>2</sup>
955020	Tack coat (m <sup>2</sup> )	Litres
955860	Dense graded asphalt pavement 14 mm mix	tonnes
955870	Dense graded asphalt pavement 20 mm mix	tonnes
955890	Dense graded asphalt pavement 40 mm mix	tonnes

**Testing Requirements**

<b>Minimum Test Frequency</b>	
<b>Materials</b>	
<b>Foundation Bedding / Haunch Zone, Overlay Zone and Side Zone</b>	
Particle Size Distribution (Grading) AS 1289.3.6.1	1 / Source / Year
Linear Shrinkage AS 1289.3.4.1	1 / Source / Year
<b>Compaction</b>	
Base Visual	1 / Line
Backfill Visual	2 / Line
Asphalt Visual	1 / Line
<b>Geometrics Asphalt</b>	
Specification Line and Level	1 / Line
<b>Asphalt</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	1 / 80 t
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A	1 / 80 t

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

## **WORK PREPARATION**

### **Plant Requirements**

Job truck (with water)

Trucks

Excavator / backhoe / gradall / loader

Pavement breaker

Vibrating compactor / wacker packer

Emulsion sprayer

### **Materials**

Dense graded asphalt to MRTS30 *Asphalt Pavements*

Emulsion to MRTS21 *Bituminous Emulsion*

Plant mix stabilised pavement

Selected shoulder material, as required, by Supplementary Specification

### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Operators

Truck drivers

Traffic controllers            2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the location of the culvert.
6. Check for services, e.g. overhead wires and buried services. Mark these, as appropriate.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.
8. Arrange the supply of culverts / pipes, and
9. Arrange and specify a disposal area for excavated material.

## WORK PROCEDURES

### Sequential Steps and Check Points

1. Establish traffic control – See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the culvert / pipe location:
  - a. should be marked out already.
3. Excavate for the culvert / pipe:
  - a. supervisor to mark out (or specify) area to
  - b. excavated
  - c. truck surplus excavated material to site, and
  - d. specified by your supervisor.
4. Install culvert:
  - a. set out invert level
  - b. check safety of lifting equipment and Roadworks Signing Guide, and
  - c. methods.
5. Replace fill and pavement:
  - a. premix backfill material and water off-site
  - b. bring material to right moisture content for compaction
  - c. uniform 75 – 100 mm layers, and
  - d. check compaction.
6. Apply seal or asphalt surfacing:
  - a. use Activity Number 128, steps 5 to 12, or Activity Number 136, steps 4 to 7.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
9. Remove traffic control:
  - a. clean / repair, as necessary.

**321 Clean Culverts, Pipes and Pits – Minor****Description**

The cleaning by hand tools of debris and silt impeding the free flow of water through culverts, pipes and pits and their inlets and outlets.

Applies to waterway installations up to and including 0.3 m<sup>2</sup> waterway opening (equates to 600 mm diameter size RCP).

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>

**Restoration Standards**

The culverts, pipes and pits and their inlets and outlets shall be free from all material that could block the free flow of water.

**Items and Units of Measurement**

Item	Description	Units of Measurement
321	Clean Culverts, Pipes and Pits – Minor	Dollars

**Testing Requirements**

None listed.

**WORK PREPARATION****Plant Requirements**

Job truck

**Materials**

None listed

**Manpower Requirements**

Leading hand 1

Labourers 2

Traffic controllers 2

**Average Daily Production**

Not detailed.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. damaged culvert?

4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the culverts, pipes or pits requiring cleaning.
6. Specify the appropriate equipment and crew and organise these, and
7. Arrange and specify a disposal area for excavated material.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine culverts, pipes or pits to be cleaned:
  - a. from supervisor's instructions.
3. Clean culvert, pipe or pit:
  - a. remove debris and silt, and
  - b. to site specified by your supervisor.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### **322 Clean Culverts, Pipes and Pits – Major**

#### **Description**

The cleaning of debris and silt impeding the free flow of water through culverts, pipes and pits and their inlets and outlets.

Applies to waterway installations greater than 0.3 m<sup>2</sup> waterway opening (equates to 600 mm diameter Reinforced Concrete Pipes (RCP)).

#### **Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area

- the restoration of the drainage structure, including the inlets and outlets to the specified standard, including the excavation and removal of all necessary material
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>

#### Restoration Standards

- The culverts, pipes and pits and their barrels, inlets and outlets shall be free from all material that could restrict the flow of water.
- The inlets and outlets shall include the area between the culvert, pipe or pit (or similar) to the outlet point of the upstream drainage system and the inlet point to the downstream drainage system. Some examples follow:
  - Where the outlet continues through a property boundary after leaving the structure, the outlet will generally include the area between the structure and the property boundary. A similar area of Maintenance would apply to the inlet.
  - Where the outlet flows into a table drain or similar after leaving the structure, the outlet will generally include the area between the structure and the table drain. A similar area of Maintenance would apply to the inlet.
  - For underground drainage systems, the inlet and outlet Maintenance usually relates to the gully pits immediately upstream and downstream of the structure.
  - Further clarification may be found in the district's "Department of Transport and Main Roads and Local Government Maintenance Responsibilities Guidelines", and
  - The site is to be left clean and tidy.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
322	Clean Culverts, Pipes and Pits – Major	m <sup>3</sup> / Dollars

#### Testing Requirements

Nil.



**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects, e.g. damaged culvert?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the culverts, pipes or pits requiring cleaning.
6. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these, and
7. Arrange and specify a disposal area for excavate material.

**323 Repair Minor Concrete Culverts, Pipes and Pits****Description**

The repair of damaged concrete culverts, pipes and pits for all bridges and culverts with an opening span, height or diameter greater than or equal to 1.8 m, and a total waterway area greater than or equal to 3.0 m<sup>2</sup>.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>

**Restoration Standards**

The concrete culverts and/or pipes, pits repaired to the standards specified in the approved repair method.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
323	Repair Minor Concrete Culverts, Pipes and Pits	Dollars

**Testing Requirements**

None listed.

**WORK PREPARATION****Plant Requirements**

Job truck

Bobcat / backhoe / loader

### **Materials**

Culvert components as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Concrete as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

### **Manpower Requirements**

Leading hand	1
Labourers	2
Operator	1
Traffic controllers	2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the culverts, pipes or pits requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control – See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices, and
  - c. safety clothing.
2. Roadworks Signing Guide:
  - a. vehicle position.
3. Determine culverts, pipes or pits:
  - a. from supervisor's instructions.
4. Repair culvert, pipe or pit:
  - a. in accordance with details in Work Order to be repaired and the relevant specifications.

5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### 324 Repair Minor Steel Drainage Structures

#### Description

The repair of steel culverts structures or pipes for all bridges and culverts with an opening span, height or diameter greater than or equal to 1.8 m, and a total waterway area greater than or equal to 3.0 m<sup>2</sup>.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>

#### Restoration Standards

The steel structures repaired to the standards specified in the approved repair method.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
324	Repair Minor Steel Drainage Structures	Dollars

#### Testing Requirements

None listed.

#### WORK PREPARATION

##### Plant Requirements

Job truck

Bobcat / backhoe / loader

##### Materials

Culvert components as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Concrete as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

### **Manpower Requirements**

Leading hand	1
Labourers	2
Operator	1
Traffic controllers	2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the structure requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine culverts, structure to be repaired:
  - a. from supervisor's instructions.
3. Repair structure:
  - a. in accordance with details in Work Order and the relevant specifications.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

**325 Repair Inlet and Outlet Scour****Description**

All work associated with restoring scoured areas of drainage inlet and outlets to a stable condition.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>

**Restoration Standards**

The drainage inlet and or outlet repaired to the standard specified in the approved repair method.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
325	Repair Inlet and Outlet Scour	m <sup>3</sup>

**Testing Requirements**

None listed.

**WORK PREPARATION****Plant Requirements**

Job truck

Bobcat / backhoe / loader

Truck

**Materials**

Rock as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Concrete as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Geotextiles as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

**Manpower Requirements**

Leading hand 1

Labourers 2

Operator 1

Traffic controllers 2

**Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the inlet / outlet requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine inlet / outlet to be repaired:
  - a. from supervisor's instructions.
3. Repair inlet / outlet:
  - a. in accordance with details in Work Order and relevant specifications.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block watercourse or drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

#### **326 Repair Scour Blocks**

Details to be advised.

#### **327 Replace or Install Cut-Off Walls**

##### **Description**

The replacement or installation of cut off walls to drainage structures.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>

**Restoration Standards**

As per Applicable Specifications and details given in the Work Order.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
327	Replace or Install Cut-Off Walls	m <sup>3</sup>

**WORK PREPARATION****Plant Requirements**

Job truck

Bobcat / backhoe / loader

Truck

**Materials**

Concrete as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

**Manpower Requirements**

Leading hand 1

Labourers 2

Operator 1

Traffic controllers 2

**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the inlets / outlets requiring the cut off walls.
6. Determine alterations required and obtain supervisor's approval of the alterations and installation methods.

7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these, and
8. Arrange and specify a disposal area for excavated material.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine inlet / outlet requiring the cut off wall treatment:
  - a. from supervisor's instructions.
3. Excavate for the cut off wall / remove old wall:
  - a. truck surplus excavated material to site specified by your supervisor.
4. Install the cut off wall:
  - a. in accordance with details in Work Order.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### **328 Minor Repairs to Erosion Sites**

#### **Description**

The repair of erosion sites between 50 mm and 300 mm. All work required to excavate unstable material, install geotextile, rockfill and/or subsoil drains, backfill the road formation and restore pavement, shoulder and bituminous surface, as required, by the design approved by the Principal.

#### **Work Operations**

The following Work Operations shall be included as part of this Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control, if required
- determination of the work area
- The repair of minor erosion, including the removal of any unstable material



- All other operation included in the Applicable Specifications and approved Environmental Management Plan (Maintenance), and
- The clean up of the site, including the disposal of any waste / collected material in accordance with any State Government legislation of Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>
MRTS51	<i>Environmental Management</i>
MRTS52	<i>Erosion and Sediment Control</i>

#### Restoration Standards

Control Measures are to be maintained to the Soil Erosion and Sediment Control Guidelines contained in the Environmental Management Plan (Maintenance).

The site shall be left clean and tidy.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
328	Minor Repairs to Erosion Sites	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

#### Testing Requirements

Not listed.

### Particular Planning Points to Consider

- Specify the appropriate plant, materials and crew (including quantities of material) and organise these.
- Have the requirements of the EMP (Maintenance) been implemented? and
- Are other Activities programmed for this area?

Plant-mix stabilised and dense graded asphalt pavement material may be placed by any equipment that does not cause the mix to segregate.

### Restoration Standards

The repaired restored works shall conform to the design approved by the Principal's Delegate.

The finished road surface shall be even and follow the line and curvature of the surrounding road surface to within  $\pm 5$  mm when measured with a 1.2 m straightedge.

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
	Provision for traffic	Lump Sum
933300	Subsoil drains, Type C	Metres
933400	Subsoil drains, Type D	Metres
934600	Geotextiles under / within embankments	m <sup>2</sup>
942100	Roadway excavation, all materials	m <sup>3</sup>
943100	Roadway embankment	m <sup>3</sup>
	Rockfill	m <sup>3</sup>
	Plant mix stabilised pavement (including cement and curing)	m <sup>3</sup>
956100	Prime (grade, rate m <sup>2</sup> )	Litres
956200	Primerseal (grade, rate m <sup>2</sup> )	Litres
956300	Seal (grade, rate m <sup>2</sup> )	Litres
956600	Spreading prime cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
956700	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m <sup>3</sup>
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m <sup>3</sup>
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (modified bitumen Class 170 + % SBS polymer)	tonnes
956920	Supply of material (bitumen cutter)	tonnes
956930	Supply of material (adhesion agent)	Kilograms

**Testing Requirements**

<b>Minimum Test Frequency</b>	
<b>Unbound Pavements and Materials for Stabilisation</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
<b>Minimum Test Frequency</b>	
Flakiness Index AS 1141.15	1 / Source / Year
CBR Q113A	1 / Source / Year
Degradation Factor Q208B	1 / Source / Year
Particle Size Distribution (Grading) Q103A	1 / 100 m <sup>3</sup>
Liquid Limit Q104A	1 / 100 m <sup>3</sup>
Linear Shrinkage Q106	1 / 100 m <sup>3</sup>
<b>Stabilised Material</b>	
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>
<b>Compaction - Earthworks</b>	
MDR AS 1289.5.1.1	1 / 500 m <sup>2</sup>
Density / Moisture Relationship (Rapid) AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Compaction (Dry Density Ratio or Hilf Density Ratio) and Moisture (Moisture Ratio, Moisture Variation or Hilf Moisture Variation) AS 1289.5.4.1 or AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Dry Density and Moisture Content AS 1289.5.8.1 or AS 1289.5.3.1	1 / 500 m <sup>2</sup>
<b>Compaction – Unbound Pavements</b>	
MDR Q142A, Q142B or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Compaction – Stabilised Pavements</b>	
MDR Q142A or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Asphalt / Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	1 / 80 t
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A,	1 / 80 t

<b>Minimum Test Frequency</b>	
Premix Q308C	
Asphalt	1 / 80 t
Voids (Compaction), Asphalt Q311 or AS/NZS 2891.8	1 / 40 t
Compacted Density / Field Density of Asphalt AS/NZS 2891.9.2, AS/NZS 2891.9.3, Q306C, Q306E or AS/NZS 2891.14.2	1 / 40 t
<b>Geometrics</b>	
Horizontal Straightedge Q712	1 / 10 m
Depth below Road Surface	1 / 10 m / Layer
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 T (2 / Lot minimum)
Flakiness Index AS 1141.15	1 / 400 T (2 / Lot minimum)
Degree of Precoating Q216	1 / 400 T (2 / Lot minimum)
<b>Bitumen</b>	
Bitumen – Sample Q080	1 / Tank
<b>Application Rates - Spraying Records</b>	
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded on a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

## **WORK PREPARATION**

### **Plant Requirements**

Job truck (with water)

Trucks

Excavator / backhoe / gradall / loader

Grader

Pavement breaker

Vibrating compactor / wacker packer

Emulsion sprayer

### **Materials**

Cover aggregate to MRTS22 *Supply of Cover Aggregate*

Bitumen to MRTS17 *Bitumen and Multigrade Bitumen*

Dense graded and open graded asphalt to MRTS30 *Asphalt Pavements*

Emulsion to MRTS21 *Bituminous Emulsion*

Plant mix stabilised pavement

Selected shoulder material, as required

### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Operator

Truck drivers

Traffic controllers            2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the location of the area to be repaired.
6. Check for services, e.g. overhead wires and buried services. Mark these, as appropriate.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these, and
8. Arrange and specify a disposal area for excavated material.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.

2. Determine the work area:
  - a. should be marked out already.
3. Excavate for the repair:
  - a. supervisor to mark out (or specify) area to excavated, and
  - b. truck surplus excavated material to site specified by your supervisor.
4. Install geotextile and/or rockfill, as required.
5. Replace fill and pavement:
  - a. premix backfill material and water off-site
  - b. bring material to right moisture content for compaction
  - c. uniform 75 – 100 mm layers, and
  - d. check compaction.
6. Apply seal or asphalt surfacing:
  - a. use Activity Number 118, steps 5 to 12, or Activity Number 155, steps 4 to 7.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
9. Remove traffic control:
  - a. clean / repair, as necessary.

### **329 Other Minor Culvert, Pipe and Pit Work**

#### **Description**

Any work carried out to culverts, pipes or pits not covered by Activity Standards Numbers 320, 321, 322, 323, 324, 325 and 327, for all bridges and culverts with an opening span, height or diameter greater than or equal to 1.8 m, and a total waterway area greater than or equal to 3.0 m<sup>2</sup>.

#### **Activity Items and Units of Measurement**

No other details are included in the Maintenance Activity Standard for this Activity.

### **330 Install Subsoil Drains**

#### **Description**

All work required to excavate the road formation and install subsoil drains, backfill and restore pavement and shoulder, as required. Does not include work carried out in conjunction with pavement repair works - see Activity Numbers 140, 143 and 144.

#### **Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials

- establishment and disestablishment of traffic control
- determination of the work area
- excavation of the trench for the subsoil drain in accordance with MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*
- the supply and installation of the subsoil drain in accordance with MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections* (including concrete outlets / surrounds, markers etc)
- all other Work Operations as detailed in the Applicable Specifications (i.e. MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*; MRTS04 *General Earthworks* etc)
- the supply, placement and compaction of backfill
- the supply, placement and compaction of cement treated pavement material (Type 2.5) stabilised with not less than 2% or more than 3% by mass of cement, where required (e.g. for road crossings)
- the supply and application of a bitumen emulsion tack coat at a rate of 0.6 m<sup>2</sup> residual bitumen, where required (e.g. for road crossings)
- the supply, placement and compaction of the asphalt wearing course, where required (e.g. for road crossings)
- forwarding a copy of “As Constructed” details of the subsoil drain to the Principal
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste / removed material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>

Reference	Title
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

Plant mix stabilised and dense graded asphalt pavement material may be placed by any equipment that does not cause the mix to segregate.

### Restoration Standards

As per Applicable Specifications, except as provided hereunder:

1. The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface, and
2. The finished surface shall be within + 5 mm of the height of the surrounding road surface.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
330	Install Subsoil Drains	Metres

### Testing Requirements

Minimum Test Frequency	
Compaction Visual	4 / Day
Straightedge Q712	1 / 20 m

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
933200	Subsoil drains, Type C	Metres
933400	Subsoil drains, Type D	Metres
	Plant mix stabilised pavement (including cement and curing)	m <sup>3</sup>
	Base, unbound pavement type (subtype)	m <sup>3</sup>
955860	Dense Graded Asphalt pavement, 14 mm mix	tonnes

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Obtain details of subsoil drain from your supervisor.
6. Specify or mark out the location of the subsoil drain.
7. Check for services, e.g. overhead wires and buried services. Mark these, as appropriate.



8. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these, and
9. Arrange and specify a disposal area for excavated material.

### **331 Inspect and/or Clean Out Subsoil Drains**

#### **Description**

The inspection and servicing of subsoil drains. Includes routine drain flush out and the removal of all vegetation and other material which could restrict the free flow of water from the subsoil drains as well as the repair or replacement of missing or damaged marker posts and outlet screens.

#### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>

#### **Restoration Standards**

Outlets to subsoil drains shall be free of material which would restrict the flow of water. Markers and screens shall be in place and in good condition.

Drainage to be free flowing.

#### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
331	Inspect and/or Clean Out Subsoil Drains	Metres

#### **Testing Requirements**

None listed.

#### **WORK PREPARATION**

##### **Plant Requirements**

Job truck

Truck

Bobcat / backhoe / loader

##### **Materials**

Marker posts and outlet screens as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

### **Manpower Requirements**

Leading hand 1

Labourers 2

Operator 1

Truck drivers

Traffic controllers

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Specify or mark out the subsoil drains requiring cleaning and markers requiring repair or replacement.
3. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these, and
4. Arrange and specify a disposal area for excavated material.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine subsoil drain to be cleaned:
  - a. from supervisor's instructions.
3. Flush out drain:
  - a. remove debris and silt, and
  - b. truck and additional material to site specified by your supervisor.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### 332 Repair Subsoil Drains

#### Description

All work required to excavate the road formation and repair subsoil drains, backfill and restore pavement and shoulder, as required. Does not include works carried out in conjunction with pavement repair type Activities - See Activity Numbers 140, 143 and 144.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>
SS	District Supplementary Specifications

Plant-mix stabilised and dense graded asphalt pavement material may be placed by any equipment that does not cause the mix to segregate.

#### Restoration Standards

The repaired subsoil drains and restored pavement and shoulder shall conform to the Applicable Specifications.

The finished surface shall be within  $\pm 5$  mm of the surrounding road surface.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
332	Repair Subsoil Drains	Dollars

#### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
912100	Provision for traffic	Lump sum
	Repair subsoil drains	Lump sum
	Plant mix stabilised pavement (including cement and curing)	m <sup>3</sup>
	Unbound base type (subtype)	m <sup>3</sup>
955860	Dense graded asphalt pavement, 14 mm mix	tonnes

Item	Description	Units of Measurement
955870	Dense graded asphalt pavement, 20 mm mix	tonnes
955890	Dense graded asphalt pavement, 40 mm mix	tonnes

### Testing Requirements

Minimum Test Frequency	
Compaction Visual	4 / day
Straightedge Q712	1 / 20 m

## WORK PREPARATION

### Plant Requirements

Job truck

Bobcat / backhoe / loader

### Materials

Culvert components as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Concrete as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Dense Graded Asphalt to MRTS30 *Asphalt Pavements*

Emulsion to MRTS21 *Bituminous Emulsion*

Bitumen to MRTS17 *Bitumen and Multigrade Bitumen*

Cover Aggregate to MRTS22 *Supply of Cover Aggregate*

Plant mix stabilised pavement

Selected shoulder material, as required, by Supplementary Specification

### Manpower Requirements

Leading hand 1

Labourers 2

Operator 1

Traffic controllers 2

### Average Daily Production

Not listed.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?

4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the subsoil drains requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine subsoil drain to be repaired:
  - a. from supervisor's instructions.
3. Repair subsoil drain:
  - a. in accordance with details in Work Order.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### **333 Repair Subsoil Drains (RAMC only)**

Details to be advised.

### **334 Clean Culverts, Pipes and Pits – Minor (RAMC only)**

Details to be advised.

### **339 Other Subsoil Drain Work**

#### **Description**

Includes work carried out on subsoil drain systems not included under Activity Numbers 330, 331 and 332.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protection</i>
MRTS04	<i>General Earthworks</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>
SS	District Supplementary Specifications

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
339	Other Subsoil Drain Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**340 Clean Floodways****Description**

The cleaning of debris, silt and regrowth of vegetation from floodway sections.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Restoration Standards**

The floodway surface and associated batters and aprons shall be free from debris, silt and regrowth of vegetation.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
340	Clean Floodways	m <sup>2</sup>

**Testing Requirements**

None listed.

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Truck

Bobcat / backhoe / loader

### **Materials**

None stated

### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Operator                         1

Truck driver

Traffic controllers            2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Are there any related defects, e.g. floodway damage?
3. Specify or mark out the floodways requiring cleaning.
4. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these, and
5. Arrange and specify a disposal area for material removed from floodway.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine floodway to be cleaned:
  - a. from supervisor's instructions.

3. Clean floodway and aprons:
  - a. remove debris and silt, and
  - b. truck surplus material to site specified by your supervisor.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### 341 Repair Floodways

#### Description

The reinstatement of damaged or deteriorated floodway structures. Includes work carried out on scour repairs to concrete and stone pitched batter and apron protection.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>

#### Restoration Standards

The floodways shall be repaired to the standards specified in the approved repair method.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
341	Repair Floodways	Dollars

#### Testing Requirements

None listed.

#### WORK PREPARATION

##### Plant Requirements

Job truck

Bobcat / backhoe / loader

##### Materials

Rock as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Concrete as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*



### **Manpower Requirements**

Leading hand	1
Labourers	2
Operator	1
Traffic controllers	2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the floodway requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine floodway to be repaired:
  - a. from supervisor's instructions.
3. Repair floodway:
  - a. in accordance with details in Work Order.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

**342 Repair Floodway Slopes and Margins****Description**

The repair of deteriorated and damaged slopes and margins to restore them to the original cross section. Includes the supply of all materials.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>

**Restoration Standards**

The floodway slopes and margins shall be repaired to the standards specified in the approved repair method.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
342	Repair Floodway Slopes and Margins	m <sup>3</sup>

**Testing Requirements**

None listed.

**WORK PREPARATION****Plant Requirements**

Job truck

Bobcat / backhoe / loader

**Materials**

Rock as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Concrete as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

**Manpower Requirements**

Leading hand	1
Labourers	2
Operator	1
Traffic controllers	2

**Average Daily Production**

None detailed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the floodway requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine floodway slopes and margins to be repaired:
  - a. from supervisor's instructions.
3. Repair floodway slopes and margins:
  - a. in accordance with details in Work Order.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### **349 Other Floodway Work**

#### **Description**

Includes work carried out on floodway structures not included under Activity Numbers 340, 341 and 342.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
349	Other Floodway Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**400 ROADSIDE****401 Tractor Slashing – Rural****Description**

The mechanical slashing of vegetation within the road reserve in a rural environment. Excludes herbicide spraying around roadside furniture.

**Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- slashing the shoulders, sight lines at intersections with Local Government roads, private accesses in rural areas and the inside of curves and clear zones where achievable. The slashing at major interchanges and other locations may also be required
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

Grass and other vegetation shall be mowed and programmed with Activity Number 407, where necessary, so as to, at all times, provide motorists with a clear view of all signs, guide markers and

guard rails and to provide Entering Sight Distance as per the Austroads *Guide to Traffic Engineering Practice - Part 5: Intersections at Grade* (Section 5.2.3). Visibility will, however, be limited in many places by earthworks, large trees and other obstructions.

All medians, raised islands and drains shall be mowed to meet the agreed Intervention Levels.

Except by specific direction, slashing is not undertaken for appearance, to reduce bush fire hazard or to remove a snake or vermin habitat.

### Restoration Standards

The extent of tractor slashing should be:

- Approximately 3.6 m (or two machine passes) on each side of the carriageway.
- Visibility triangles at intersections to establish, where possible, entering sight distance.
- A greater distance on the inside of curves to maintain stopping sight distance. In general, this distance should be 9.0 m or, on tight curves in higher speed environments, 14.0 m. The following table gives greater detail.

Speed Environment (km / hr)	Curve Radius (m)	Width of Clearing on Inside of Curve (m)
100	400	9
100	800	5
130	800	14
130	1200	9
130	2200	5

- 12 m in front of official signs is necessary for visibility to approaching traffic, and
- 2 m around the perimeter of all timber noise barriers.

When required, a greater width should be mowed to destroy any tree seedlings growing within the clear zone and/or in table drains. In 100 km / hr speed zones, the width to be slashed in this way is 9.0 m from the edge of the traffic lane.

The slashed vegetation shall be less than 100 mm high for the areas stated above.

No debris is to be thrown onto the sealed carriageway.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
401	Tractor Slashing – Rural	Hectares

### Testing Requirements

Minimum Test Frequency	
Cut Height	1 / Day

### Particular Planning Points to Consider

1. Is an alternative treatment or major maintenance more appropriate, e.g. grading of verge?
2. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.
3. Check for litter and arrange for collection prior to mowing, if appropriate, and
4. Activity would normally be done on a set program to keep vegetation at or below the agreed Intervention Level.

## 402 Tractor Slashing – Urban

### Description

The mechanical slashing of vegetation within the road reserve in urban built up areas. Includes slashing to a width of 2 m outside the line of guide posts and herbicide spraying around roadside furniture. Excludes mowing of grass and vegetation by hand mower and/or brush cutter - see Activity Number 404.

### Work Operations

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- mowing of vegetation, using self-propelled / ride on type mowers within the road reserve, including medians, drains and around roadside furniture (including sound barrier fencing) or elsewhere, as required
- the submission of a mowing program to the Principal for acceptance, showing the areas to be regularly maintained by this Activity
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

Grass and other vegetation shall be mowed so as to, at all times, provide motorists with a clear view of all signs, guide markers and guard rails and to provide Entering Sight Distance as per the Austroads

*Guide to Traffic Engineering Practice - Part 5: Intersections at Grade* (Section 5.2.3). All medians, raised islands and drains shall be mown to meet agreed Intervention Levels.

### Restoration Standards

The slashed vegetation shall be less than 75 mm high. No debris shall be thrown onto the sealed carriageway.

Restoration Standards for visibility triangles at intersections, visibility of signs and the inside of curves are as per the requirements for Activity Number 401.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
402	Tractor Slashing – Urban	Hectares

### Testing Requirements

Minimum Test Frequency	
Cut Height	One day

### Particular Planning Points to Consider

1. Is an alternative treatment or major maintenance more appropriate, e.g. grading of verge?
2. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.
3. Check for litter and arrange for collection prior to mowing, if appropriate, and
4. This would normally be done on a set program to keep vegetation at or below the agreed Intervention Level.

### 403 Tractor Slashing – Boom Mower

#### Description

The tractor slashing of vegetation within the road reserve using a boom mower attachment.

Refer to Activity Number 401 for details relating to this Activity. This Activity should generally be used where conventional tractors and slashers cannot gain access to maintain around roadside furniture.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
403	Tractor Slashing – Boom Mower	m <sup>2</sup>

## 404 Hand Mowing

### Description

The mowing of grass and vegetation by hand-mower and/or brush cutter (or other hand equipment) in medians, drains and around roadside furniture (including sound barrier fencing) or elsewhere, as required (including rest areas owned by the Department). This Activity shall be only undertaken when Activity Numbers 401 and 402 are not applicable.

All medians, raised islands and drains shall be mowed to meet the agreed Intervention Levels.

### Work Operations

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- mowing by hand, in medians, drains and around roadside furniture (including sound barrier fencing) or elsewhere, as required
- the submission of a hand mowing program to the Principal for acceptance, showing the areas to be regularly maintained by this Activity
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

Grass and other vegetation shall be mown so as to, at all times, provide motorists with a clear view of all signs, guide markers and guard rails and to provide Entering Sight Distance as per the *Austrroads Guide to Traffic Engineering Practice - Part 5: Intersections at Grade* (Section 5.2.3).

### Restoration Standards

All grass shall be mowed to less than 75 mm high.

No vegetation shall be thrown onto the sealed carriageway.

Restoration Standards for visibility triangles at intersections, visibility at signs and inside of curves are as per requirements for Activity Number 401.



**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
404	Hand Mowing	m <sup>2</sup>

**Testing Requirements**

Minimum Test Frequency	
Cut Height	One day

**Particular Planning Points to Consider**

1. Is an alternative treatment or major maintenance more appropriate, e.g. herbicide spraying?
2. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.
3. Check for litter and arrange for collection prior to mowing, if appropriate, and
4. This would normally be done on a set program to keep vegetation at or below the agreed Intervention Level.

**405 Clearing****Description**

The removal or pruning of all roadside vegetation, other than grass, for the purpose of safety or visibility clearing. Includes trees too close to the road and branches / trees likely to fall on the road. Also includes chipping, grading, weeding, burning operations and treating the stump with herbicide to prevent regrowth.

**Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- clearing / pruning of trees and branches within sight lines at intersections with Local Government roads, private accesses in rural areas, on the inside of curves and within clear zones. The clearing within major interchanges and other areas may also be required
- clearing of trees too close to the road and branches / trees likely to fall on the road. Operations also include chipping (i.e. using a mechanical chipper / mulcher) and treating the stump with herbicide to prevent regrowth. Any other proposed methods of disposal will need to be submitted to the Principal for acceptance
- all other operations included in the Applicable Specifications

- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>

The extent of visibility clearing shall be:

- The Restoration Standards required at these locations will be to remove trees and shrubs from the shoulder of the road to a line 2 m past the bottom of the table drain, or to 6 m from the edge of the through lane, whichever is the lesser, and
- Visibility triangles at intersections to establish, where possible, entering sight distance as per Austroads 1989 INTERSECTIONS AT GRADE Section 5.2.3. It is accepted that, in some situations, this standard may not be practical, i.e. where a vertical curve limits site, where private property prevents clearing, where environmental issues may prevent or limit such work, or where earthworks may be necessary to obtain the specified sight distances.

A greater distance on the inside of curves to maintain stopping sight distance. In general, this distance should be 9 m, or on tight curves in higher speed environments, 14 m.

The following gives greater detail.

- 120 m in front of official signs, as necessary, for visibility to approaching traffic, and
- Trees and shrubs shall be cut near ground level and debris removed to a recognised dumping site. Cut stumps and/or regrowth to be herbicide treated. Wherever possible, cleared areas are then to be maintained using a slasher, as required.

### Restoration Standards

All specified branches / trees to be removed / trimmed.

No regrowth. No debris left on the sealed carriageway.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
405	Clearing	Dollars

### Testing Requirements

None listed.

### Particular Planning Points to Consider

1. Specify or mark out the area requiring cleaning.
2. Check if the trees are of special significance, e.g. memorial. If so, works are to be approved by the Principal.
3. Check for services, e.g. overhead wires and buried services. Mark these, as appropriate.
4. Specify the appropriate plant, materials and crew (including quantities of materials) and chemical spray rate and organise these.
5. Arrange for safe storage of chemicals.
6. Ensure the spray operator has an appropriate licence.
7. Arrange and specify a disposal area for cleared material.
8. Determine the traffic control required during the clearing operations to avoid risk to public, and
9. Supervisor must be present on-site if operation will cause temporary road closure.

### 406 Herbicide Spot Spraying – Declared Plants

#### Description

The identification and eradication of declared plants within the road reserve (including rest areas owned by the department). This includes either the sprayed or manual application of chemical herbicide. Excludes the spraying of other plants which is undertaken as Activity Number 407.

Other vegetation can be treated subject to the approval of the Principal under Activity Number 407.

#### Work Operations

The following operations shall be included as part of the above Activity:

Speed Environment (km / hr)	Curve Radius (m)	Width of Clearing on Inside of Curve (m)
100	400	9
100	800	5
130	800	14
130	1200	9
130	2200	5

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the preparation, submission and maintenance of a spraying procedure
- spraying of all declared plants in accordance with the Restoration Standards and Applicable Specifications
- all other operation included in the Applicable Specifications

- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections compliance and audit testing, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation of Local Government by-laws that are applicable.

Where classification of details in relation to the above Work Operations is required, the following Application Specifications and Acts provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
-	<i>Agricultural Chemicals Distribution Control Act 1996-1968</i>
-	<i>Commercial Operator's Manual</i>
-	<i>Rural Land Protection Act 1985</i>

- All plants declared under the *Rural Land Protection Act 1985* on the road reservation shall be eradicated.
- All spray operators shall be licensed to comply with the *Agricultural Chemicals Distribution Control Act 1966-1968* and *Commercial Operator's Manual 1983*.
- The Contractor shall submit full details of the proposed spraying operations, including a description of the areas to be treated (and extent thereof), the herbicide to be used, and the concentration and application rates to the Principal, and shall not commence operations until the details are accepted by the Principal.
- All chemicals used shall comply with all relevant Australian Standards. State Government legislation and Local Authority regulations.
- Herbicides used are to be approved for use on the target species by Department of Primary Industries (DPI), and
- Herbicide to be used in accordance with the manufacturer's recommendations.

#### Restoration Standards

All targeted vegetation as per the approved procedures killed.

No other vegetation sprayed or killed.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
406	Herbicide Spot Spraying – Declared Plants	Dollars

#### Testing Requirements

Visual inspections only to ensure the above Restoration Standards are achieved.

#### Particular Planning Points to Consider

1. Determine the type of chemical spray, concentration and application rate.
2. Arrange for safe handling and storage of chemicals.

3. Check area and adjacent properties for grass, trees, crops etc that must not be affected by chemicals. Make careful note of these on the operator's Spraying Sheet.
4. Ensure the spray operator has an appropriate licence, and
5. Inspect the area after ten days to confirm that the spraying has been successful.

#### **407 Herbicide Spraying**

##### **Description**

The supply and application by spraying of chemical herbicide for the control of vegetation growing around roadside furniture and structures (including rest areas owned by the department). Excludes the spot spraying of declared plants which is undertaken under Activity Number 406.

##### **Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control
- determination of the work area
- the preparation, submission and maintenance of a spraying procedure
- spraying of all areas in accordance with the Restoration Standards and Applicable Specifications
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

##### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
-	<i>Agricultural Chemicals Distribution Control Act 1996-1968</i>
-	<i>Commercial Operator's Manual</i>
-	<i>Rural Land Protection Act 1985</i>

The following provisions shall apply to the spraying of herbicides:

1. All vegetation within 1 m of all signs, guide markers and guard rails shall be sprayed.
2. Other vegetation can be treated subject to the approval of the Principal's Delegate or his representative.

3. All spray operators shall be licensed to comply with the *Agricultural Chemicals Distribution Control Act 1966-1978* and *Commercial Operator's Manual 1983*.
4. Only "knockdown" herbicides may be used on the road reserve. "Residual" herbicides are not permitted.
5. Arrange for safe handling and storage of chemicals.
6. The contractor shall submit full details of proposed spraying operations to the Principal's Delegate and shall not commence operations until the details are approved by the Principal's Delegate or his representative, and
7. Herbicides are to be used in accordance with the manufacturer's recommendations.

### Restoration Standards

All targeted vegetation killed.

No other vegetation sprayed.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
407	Herbicide Spraying	Litres

### Testing Requirements

Visual inspections only to ensure the Restoration Standards are achieved.

### Particular Planning Points to Consider

1. Is an alternative treatment or major maintenance more appropriate, e.g. grading of verge?
2. Specify the appropriate plant, materials and crew (including type of chemical spray and application rate) and organise these.
3. Arrange for safe handling and storage of chemicals.
4. Check area and adjacent properties for grass, trees, crops etc that must not be affected by chemicals. Make careful note of these on the operator's Spraying Sheet.
5. Ensure the spray operator has an appropriate licence, and
6. Inspect the area after ten days to see if the spraying has been successful.

### 408 Tractor Treatment – Chemical

#### Description

The chemical treatment of vegetation within the road reserve by tractor mowing.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

Vegetation shall be mowed so as to, at all times, provide motorists with a clear view of all signs, guide markers and guard rails and to provide Entering Sight Distance as per the Austroads *Guide to Traffic*

*Engineering Practice - Part 5: Intersections at Grade* (Section 5.2.3). All medians, raised islands and drains shall be mowed to meet the agreed Intervention Levels.

### Restoration Standards

The extent of tractor slashing should be:

- Approximately 3.6 m (or two machine passes) on each side of the carriageway.
- Visibility triangles at intersections to establish, where possible, entering sight distance.
- A greater distance on the inside of curves to maintain stopping sight distance. In general, this distance should be 9 m, or, on tight curves in higher speed environments, 14 m (the following table gives greater detail), and

Speed Environment (km / hr)	Curve Radius (m)	Width of Clearing on Inside of Curve (m)
100	400	9
100	800	5
130	800	14
130	1200	9
130	2200	5

- 120 m in front of official signs, as necessary, for visibility to approaching traffic.

When required, a greater width should be mowed to destroy any tree seedlings growing within the clear zone and/or in table drains. In 100 km / hr speed zones, the width to be slashed in this way is 9 m from the edge of the traffic lane.

The slashed vegetation shall be less than 100 m high for the areas stated above.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
408	Tractor Treatment – Chemical	Hectares

### Testing Requirements

None listed.

### WORK PREPARATION

#### Plant Requirements

Job truck

Tractor / mower with attachment fitted with chemical applicators

Knapsack sprayer

#### Materials

Chemical (non residual)

### **Manpower Requirements**

Leading hand	1
Labourers	1 (for each knapsack)
Operator	1

### **Average Daily Production**

3 hectares

### **Particular Planning Points to Consider**

1. Is an alternative treatment or major maintenance more appropriate, e.g. grading of verge?
2. Specify the appropriate plant, materials and crew (including type of chemical spray and application rate) and organise these.
3. Arrange for safe handling and storage of chemicals.
4. Check area and adjacent properties for grass, trees, crops etc that must not be affected by chemicals. Make careful note of these on the operator's Spraying Sheet.
5. Ensure the spray operator has an appropriate licence, and
6. Inspect the area after ten days to see if the spraying has been successful.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control – See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing
  - d. vehicle position, and
  - e. ensure you are working to the HAZCEM code.
2. Determine the work area:
  - a. from normal program or from supervisor's instructions.
3. Inspect the work area:
  - a. ensure area free of objects that may damage the machine.
4. Set mowing height:
  - a. too low may damage the chemical applicators and eradicate the vegetation ground cover, and
  - b. too high is inefficient.
5. Mow the specified area:
  - a. mow in the direction of traffic
  - b. travel at approximately 6 km / hr, and



- c. use knapsack spray around roadside furniture, trees etc, if required.
- 6. Check the work against the Restoration Standards.
- 7. Leave work site safe and tidy:
  - a. ensure dead vegetation will not block drainage.
- 8. Remove traffic control:
  - a. clean / repair, as necessary.

#### 409 Seeding or Planting

##### Description

The supply, planting and maintenance of shrubs and trees, including fertilising, watering, mulching and weeding.

##### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS16	<i>Landscape and Revegetation Works</i>

##### Restoration Standards

As per MRS16 *Landscape and Revegetation Works* and details in Work Order.

##### Activity Items and Units of Measurement

Item	Description	Units of Measurement
409	Seeding or Planting	m <sup>2</sup>

##### Testing Requirements

Minimum Test Frequency	
Hole Size	1 / 10 Holes
Watering	Each (Lot)

#### WORK PREPARATION

##### Plant Requirements

Job truck

Bobcat / backhoe / grader / loader

Trucks

Water tanker

### **Materials**

Seeds

Turf

Trees

Shrubs

Fertiliser

Water

Hydromulching equipment

### **Manpower Requirements**

Leading hand                    1

Labourers                        1 - 3

Operator                         As required

Traffic controllers            As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Is an alternative treatment or major maintenance more appropriate?
2. Specify or mark out the area requiring seeding or planting.
3. Specify and organise the appropriate plant, materials and crew (including application rates of mulch and seeds).
4. Make arrangements for planting materials, as required.
5. Organise the watering and fertilising of seeded or planted areas, and
6. Check planted area weekly until established.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Spread topsoil, as required.

4. Seed the specified area:
  - a. apply mulch and seed
  - b. check application rates, and
  - c. water, as specified.
5. Plant the specified area:
  - a. check the spacing of planting
  - b. water, as specified, and
  - c. apply mulch, if required.
6. Check the work against the Restoration Standards.
7. Leave work site safe and tidy:
  - a. ensure topsoil does not block drainage.
8. Remove traffic control:
  - a. clean / repair, as necessary.
9. Watering and fertilising:
  - a. as per specified schedule.

#### 410 Landscape Planting – Urban

##### Description

The supply, planting and maintenance until initial establishment of shrubs and trees, including fertilising, watering, mulching and weeding in an urban environment.

##### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS16	<i>Landscape and Revegetation Works</i>

##### Restoration Standards

As per MRTS16 *Landscape and Revegetation Works* and details in Work Order.

##### Activity Items and Units of Measurement

Item	Description	Units of Measurement
410	Landscape Planting – Urban	Each (Plant)

##### Testing Requirements

Minimum Test Frequency	
Hole Size	1 /10 Holes
Watering	Each (Lot)

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Bobcat / backhoe / loader

Trucks

Water tanker

### **Materials**

Trees

Shrubs

Fertiliser

Water

Hydromulching equipment

### **Manpower Requirements**

Leading hand                    1

Labourers                        1 - 3

Operator                         As required

Traffic controllers            As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Is an alternative treatment or major maintenance more appropriate?
2. Specify or mark out the area requiring planting.
3. Specify and organise the appropriate plant, materials and crew.
4. Make arrangements for planting materials, as required.
5. Organise the watering and fertilising of planted areas, and
6. Check planted area weekly until established.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.

2. Determine the work area:
  - a. from supervisor's instructions.
3. Prepare planting holes:
  - a. check the spacing of planting.
4. Plant the specified area:
  - a. water, as specified, and
  - b. apply mulch, if required.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. ensure topsoil does not block drainage.
7. Remove traffic control:
  - a. clean / repair, as necessary.
8. Water and fertilise:
  - a. as per specified schedule.

#### **411 Maintain Landscaping – Minor**

##### **Description**

All works associated with the ongoing maintenance of landscaping under Activity Number 410. Includes fertilising and weeding of facility.

##### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS16	<i>Landscape and Revegetation Works</i>

##### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
411	Maintain Landscaping – Minor	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

#### **412 Mulching**

##### **Description**

The treatment by mulching to eliminate the growth of vegetation. Includes poisoning of existing ground cover, supplying and placing of a weed inhibiting membrane and laying of mulch material.

##### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>

Reference	Title
MRTS16	<i>Landscape and Revegetation Works</i>

### Restoration Standards

As per MRTS16 *Landscape and Revegetation Works* and details in Work Order.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
412	Mulching	m <sup>2</sup>

### Testing Requirements

None listed.

### WORK PREPARATION

#### Plant Requirements

Job truck

Bobcat / backhoe / loader

Truck-mounted pump with sprayer

Trucks

#### Materials

Chemical spray

Weed inhibiting membrane

Chip mulch

#### Manpower Requirements

Leading hand 1

Labourers 1 - 3

Operator As required

Traffic controllers As required

#### Average Daily Production

Not listed.

#### Particular Planning Points to Consider

1. Is an alternative treatment or major maintenance more appropriate?
2. Specify or mark out the area requiring mulching.
3. Specify the appropriate plant, materials and crew (including type of chemical spray, type of mulch and underlay and application rates) and organise these.
4. Arrange for safe handling and storage of chemicals.

5. Check area and adjacent properties for vegetation that must not be affected by chemicals. Make careful note of these on the operator's Spraying Sheet.
6. Only "knockdown" herbicides may be used on the road reserve.
7. "Residual" herbicides are not permitted for use, and
8. Ensure the spray operator has an appropriate licence in accordance with the *Agricultural Chemicals Distribution Control Act 1966-1978* and *Commercial Operator's Manual 1983*.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Inspect the work area:
  - a. note position of vegetation that must not be sprayed, and
  - b. supervisor may have specified these in your instructions.
4. Check weather and wind:
  - a. do not spray if rain likely, and
  - b. do not spray if wind will blow the spray towards other vegetation.
5. Spray the specified area:
  - a. work in the direction of traffic, and
  - b. take care to spray only the specified vegetation.
6. Record the area sprayed:
  - a. notify your supervisor if you spray other vegetation, and
  - b. record the area sprayed on your spray sheet.
7. Place weed inhibiting underlay.
8. Place mulch:
  - a. to the specified depth.
9. Check the work against the Restoration Standards.
10. Leave work site safe and tidy:
  - a. remove any spilt or excess material.
11. Remove traffic control:

- a. clean / repair, as necessary.

#### 414 Management of Invasive Animal Species

Details to be advised.

#### 415 Roadside Burning Off

##### Description

All works associated with the treatment of vegetation on the road reserve through a planned 'burn off' program.

##### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

##### Activity Items and Units of Measurement

Item	Description	Units of Measurement
415	Roadside Burning Off	Hectares / Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

#### 416 Construction / Maintenance of Mineral Earth Fire Break

Details to be advised.

#### 418 Clearing of Roadside Hazards

##### Description

All works associated with the clearing of roadside hazards, including disposal.

##### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

##### Activity Items and Units of Measurement

Item	Description	Units of Measurement
418	Clearing of Roadside Hazards	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

#### 419 Other Vegetation Control Works

##### Description

Any work carried out to control vegetation on the road reservation not covered by Activity Numbers 401, 402, 403, 404, 405, 406, 408, 409, 410, 411, 412 and 415.



**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS16	<i>Landscape and Revegetation Works</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
419	Other Vegetation Control Works	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**420 Roadside Litter Collection – Rural****Description**

The collection and disposal of litter and rubbish, whether from bins located along the right of way or from the right of way itself, in rural areas. Includes the repair and maintenance of receptacles. See Activity Number 421 for litter collection in urban built up areas.

**Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control, if required
- determination of the work area
- the collection, removal from site and the disposal of all litter from the road reserve in environmentally sensitive areas (i.e. in close proximity to creeks and waterways etc)
- the collection, removal from site and the disposal of all litter which is greater in size than 100 cm<sup>2</sup> from the sealed carriageway, particularly tyre pieces
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

All areas of concentrated litter and rubbish threatening environmentally sensitive areas within the road reserve may be removed. The collection, removal and disposal of tyre pieces and other litter over the

size of 100 cm<sup>2</sup> on the sealed roadway (which is constructed of a dense material and is likely to become a traffic hazard as a projectile if displaced by a vehicle or hazardous when struck by a motorcycle) shall take priority over litter that is not located on the sealed surface.

This scheduled item includes dumping fees in accordance with Local Government and other statutory regulations.

### Restoration Standards

- No litter over the size of 100 cm<sup>2</sup> potentially hazardous to traffic (as nominated above) shall remain on the sealed roadway.
- No litter shall remain in the vicinity of environmentally sensitive areas, and
- The site shall be left clean and tidy.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
420	Roadside Litter Collection – Rural	Dollars

### Testing Requirements

Nil.

### Particular Planning Points to Consider

1. Specify the appropriate plant and crew and organise these.
2. Check for litter and define collection area, and
3. This Activity would normally be done on a set program to keep litter at or below the Intervention Level.

### 421 Roadside Litter Collection – Urban

#### Description

The collection and disposal of litter and rubbish, whether from bins located along the right of way or from the right of way itself in an urban built up environment. Includes the repair and maintenance of receptacles.

#### Work Operations

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control, if required
- determination of the work area
- the collection, removal from site and the disposal of all litter from the road reserve in environmentally sensitive areas (i.e. in close proximity to creeks and waterways etc)
- the collection, removal from site and the disposal of all litter which is greater in size than 100 cm<sup>2</sup> from the sealed carriageway, particularly tyre pieces
- all other operations included in the Applicable Specifications

- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

All areas of concentrated litter and rubbish threatening environmentally sensitive areas within the road reserve may be removed. The collection, removal and disposal of tyre pieces and other litter over the size of 100 cm<sup>2</sup> on the sealed roadway (which is constructed of a dense material and is likely to become a traffic hazard as a projectile if displaced by a vehicle or hazardous when struck by a motorcycle) shall take priority over litter that is not located on the sealed surface.

This scheduled item includes dumping fees in accordance with Local Government and other statutory regulations.

#### Restoration Standards

- No litter over the size of 100 cm<sup>2</sup> potentially hazardous to traffic (as nominated above) shall remain on the sealed roadway
- No litter shall remain in the vicinity of environmentally sensitive areas, and
- The site shall be left clean and tidy.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
421	Roadside Litter Collection – Urban	m <sup>3</sup>

#### Testing Requirements

None listed.

#### Particular Planning Points to Consider

1. Specify the appropriate plant and crew and organise these.
2. Check for litter and define collection area, and
3. This Activity would normally be done on a set program to keep litter at or below the Intervention Level.

#### 422 Graffiti Removal

##### Description

The removal of graffiti from road infrastructure assets.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Restoration Standards**

All graffiti is removed.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
422	Graffiti Removal	m <sup>2</sup> / Dollars

**Testing Requirements**

Minimum Test Frequency	
Graffiti Removed (Visual)	1 / Asset

**WORK PREPARATION****Plant Requirements**

Job truck

Water tank

Pressure sprayer

**Materials**

Water

Detergent

Cleaning rags, soft brushes and cleaning pads

Solvents

Paint / graffiti remover

**Manpower Requirements**

Leading hand 1

Labourers 1 - 3

Operators As required

Traffic controllers As required

**Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Define the infrastructure asset for cleaning.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects, e.g. damage to asset?
4. Is an alternative remedy more appropriate e.g. replacement, and
5. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Clean off graffiti:
  - a. use paint / graffiti remover or solvent
  - b. wash with mild detergent solution, and
  - c. rinse with clean water.
4. Check for damage to coating:
  - a. if damage, advise supervisor.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### **423 Roadside Sweeping**

#### **Description**

The removal of all loose material from the edges of the road surface and from the road lines by mechanical means, including hand removal of larger debris. Does not include sweeping of large areas or intersections – See Activity Number 130.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

All loose material shall be removed from the sealed carriageway and disposed of in a neat and tidy manner away from the road formation and drainage lines.

**Restoration Standards**

All loose material shall be removed from the edges of the road surface and road lines.

Item	Description	Units of Measurement
423	Roadside Sweeping	Metres

**Testing Requirements**

Minimum Test Frequency	
Tight Surface	One day

**WORK PREPARATION****Plant Requirements**

Rotary or suction broom

Pilot vehicle (maintenance patrol truck or utility)

Electronic variable message sign (if available)

**Materials**

Nil

**Manpower Requirements**

Operator 1

Driver 1

Labourers 2

Traffic controllers 2

**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. Specify the appropriate plant and crew and organise these.
2. Check for litter and arrange for collection prior to sweeping, if appropriate, and
3. This Activity would normally be done on a set program to keep debris at or below the Intervention Level.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from sweeping program or supervisor's instructions.
3. Remove larger debris by hand:
  - a. debris that would not be removed by the sweeper or may damage it.
4. Sweep the specified area:
  - a. drive in the direction of traffic flow
  - b. pilot vehicle driving 100 – 300 m behind, according to speed limit and traffic conditions, and
  - c. use two-way radio for communication.
5. Check the work against the Restoration Standards.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### **424 Removal of Unauthorised Signs**

#### **Description**

The removal of unauthorised signs from the road reservation.

#### **Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- the preparation of a report for the monthly review meeting
- establishment and disestablishment of traffic control (if required)
- determination of the work area
- removal of sign and supports (if applicable), including storage and disposal
- the issuing of written advice to repeat offenders concerning their breach of the relevant Acts
- provide notification to the police of vehicle mounted signs or roadside vendors
- all other operations included in the Applicable Specifications

- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

### Unauthorised Signs

#### 1. Introduction

Advertising signs are permitted on declared road reserves when they are authorised by the Director General, Department of Transport and Main Roads, under the Transport Infrastructure (Roads) Act 1994.

#### 2. Authorised Signs

In general, the only authorised signs are:

- static illuminated street name signs ("Identilites")
- signs attached to bus shelter sheds, and
- art union signs (Mater Hospital, Endeavour Foundation, Boys Town etc).

#### 3. Unauthorised Signs

##### a. Signs to be removed immediately

The Contractor shall immediately remove, from the road reserve, any advertising signs attached to road furniture (i.e. traffic signs, guide posts, guard rail, signal posts, light poles etc).

The signs shall be removed in such a way as to cause minimal damage to the sign. The signs shall be stored at the Contractor's depot until they are collected by the owners or finally destroyed, as approved by the Principal.

##### b. Signs to be referred to the Police

Regulation 126 of the Traffic Act 1949 gives the Police District Superintendent of Traffic control over handheld or vehicle-mounted advertising devices.

Instances of advertising signs mounted on a registered vehicle (motor vehicle or trailer), which is parked on the road reserve for an extended period, shall be referred to the nearest police station.



- c. Signs to be referred to the Principal's Delegate

Any advertising sign not covered by the first dot point, '1. Introduction', should be referred to the Principal's Delegate. The Principal's Delegate or representative shall then instruct the Contractor whether or not to remove the sign.

### Restoration Standards

No unauthorised signs on the road reserve, except those which have been reported to the police or to the Principal's Delegate.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
424	Removal of Unauthorised Signs	Each (Sign)

### Testing Requirements

None listed.

### Particular Planning Points to Consider

1. Define the sign for removal.
2. Specify and organise the appropriate plant, materials and crew (including quantities of materials).
3. Advise supervisor of signs removed, and
4. Ensure signs removed are stacked carefully for retrieval by owners.

## 425 Earthworks, Visibility Clearing

### Description

All works involved with excavation undertaken to clear visibility lines.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>

### Restoration Standards

The earthworks shall conform to MRTS04 *General Earthworks* and the directions on the Work Order.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
425	Earthworks, Visibility Clearing	m <sup>3</sup>

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
912100	Provision for traffic	Lump Sum
942100	Roadway excavation, all materials	m <sup>3</sup>

### **Testing Requirements**

None listed.

### **WORK PREPARATION**

#### **Plant Requirements**

Job truck

Trucks

Excavator / bobcat / backhoe / gradall / grader

Loader

Rotary broom

Water tanker

#### **Materials**

None required.

#### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Operator

Truck drivers

Traffic controllers            2

#### **Average Daily Production**

Not listed.

#### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the area requiring excavation.
6. Check for services, e.g. overhead wires and buried services. Mark these, as appropriate.
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.
8. Provide a sketch of desired finished cross-section and plan of area to be excavated, and
9. Arrange and specify a disposal area for excavated material.

## WORK PROCEDURES

### Sequential Steps and Check Points

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions, and
  - b. remove guide posts and other roadside furniture, if needed.
3. Excavate the work area:
  - a. supervisor to mark out (or specify) area to excavated
  - b. supervisor to provide sketch of finished cross-section, and
  - c. truck surplus excavated material to site specified by your supervisor.
4. Check the work against the Restoration Standards:
  - a. make regular checks while you are doing the job
  - b. check depth of excavation, and
  - c. check to ensure finished excavation drains.
5. Leave work site safe and tidy:
  - a. remove all loose material
  - b. no material to block drains, and
  - c. use rotary broom or water tanker for pavement.
6. Replace roadside furniture.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### 426 Repair Minor Stability Problems

#### Description

All work required to excavate unstable material, install geotextile, rockfill and/or subsoil drains, backfill the road formation and restore pavement, shoulder and bituminous surface, to a maximum depth of 50 mm, as required by the design approved by the Principal.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>

Reference	Title
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

Plant-mix stabilised and dense graded asphalt pavement material may be placed by any equipment that does not cause the mix to segregate.

### Restoration Standards

The repaired restored works shall conform to the design approved by the Principal's Delegate.

The finished road surface shall be even and follow the line and curvature of the surrounding road surface to within  $\pm 5$  mm, when measured with a 1.2 m straightedge.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
426	Repair Minor Stability Problems	m <sup>3</sup>

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
	Provision for traffic	Lump Sum
933300	Subsoil drains, Type C	Metres
933400	Subsoil drains, Type D	Metres
934600	Geotextiles under / within embankments	m <sup>2</sup>
942100	Roadway excavation, all materials	m <sup>3</sup>
943100	Roadway embankment	m <sup>3</sup>
	Rockfill	m <sup>3</sup>
	Plant-mix stabilised pavement (including cement and curing)	m <sup>3</sup>
956100	Prime (grade, rate m <sup>2</sup> )	Litres
956200	Primerseal (grade, rate m <sup>2</sup> )	Litres
956300	Seal (class, rate m <sup>2</sup> )	Litres
956600	Spreading prime cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>
956700	Spreading cover aggregate (size mm, rate 1 m <sup>3</sup> / m <sup>2</sup> )	m <sup>3</sup>

Item	Description	Units of Measurement
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m <sup>3</sup>
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m <sup>3</sup>
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m <sup>3</sup>
956900	Supply of material (bitumen Class 170)	tonnes
956910	Supply of material (modified bitumen Class 170+ % SBS polymer)	tonnes
956920	Supply of material (bitumen cutter)	tonnes
956930	Supply of material (adhesion agent)	Kilograms

### Testing Requirements

Minimum Test Frequency	
<b>Unbound Pavements and Materials for Stabilisation</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet / Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Flakiness Index AS 1141.15	1 / Source / Year
CBR Q113A	1 / Source / Year
Degradation Factor Q208B	1 / Source / Year
Particle Size Distribution (Grading) Q103A	1 / 100 m <sup>3</sup>
Liquid Limit Q104A	1 / 100 m <sup>3</sup>
Linear Shrinkage Q106	1 / 100 m <sup>3</sup>
<b>Stabilised Material</b>	
Stabilising Agent Content Q134	1 / 100 m <sup>3</sup>
<b>Compaction -Earthworks</b>	
MDR AS 1289.5.1.1	1 / 500 m <sup>2</sup>
Density / Moisture Relationship (Rapid) AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Compaction (Dry Density Ratio or Hilf Density Ratio) and Moisture (Moisture Ratio, Moisture Variation or Hilf Moisture Variation) AS 1289.5.4.1 or AS 1289.5.7.1	1 / 500 m <sup>2</sup>
Dry Density and Moisture Content AS 1289.5.8.1 or AS 1289.5.3.1	1 / 500 m <sup>2</sup>
<b>Compaction – Unbound Pavements</b>	
MDR Q142A, Q142B or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>

<b>Minimum Test Frequency</b>	
Compacted Dry Density and Insitu Moisture Content Q141A or Q141B	1 / 500 m <sup>2</sup>
<b>Compaction – Stabilised Pavements</b>	
MDR Q142A or Q144A	1 / 500 m <sup>2</sup>
Relative Compaction Q140A	1 / 500 m <sup>2</sup>
Compacted Dry Density and Insitu Moisture Content Q141A or Q142B	1 / 500 m <sup>2</sup>
<b>Asphalt Premix</b>	
Materials / Mix Design Q309	1 / Source / Year
Maximum Density of Asphalt AS/NZS 2891.7.1	1 / 80 t
Binder Content and Aggregate Grading, Asphalt AS/NZS 2891.3.1 or Q308A, Premix Q308C	1 / 80 t
Asphalt	1 / 80 t
Voids (Compaction), Asphalt Q311 or AS/NZS 2891.8	1 / 40 t
Compacted Density / Field Density of Asphalt AS/NZS 2891.9.2, AS/NZS 2891.9.3, Q306C, Q306E or AS/NZS 2891.14.2	1 / 40 t
<b>Geometrics</b>	
Horizontal Straightedge Q712	1 / 10 m
Depth below Road Surface	1 / 10 m / Layer
<b>Cover Aggregate</b>	
Wet Strength AS 1141.22	1 / Source / Year
Wet/Dry Strength Variation AS 1141.22	1 / Source / Year
Crushed Particles AS 1141.18	1 / Source / Year
Weak Particles AS 1141.32	1 / Source / Year
Particle Size Distribution (Grading) AS 1141.11.1	1 / 400 t (2 / Lot minimum)
Flakiness Index AS 1141.15	1 / 400 t (2 / Lot minimum)
Degree of Precoating Q216	1 / 400 t (2 / Lot minimum)
<b>Bitumen</b>	
Bitumen – Sample Q080	1 / Tank
<b>Application Rates – Spraying Records</b>	
Maximum Lot Size	One day

The testing requirements listed for all the materials above shall apply to the cumulative quantities used throughout the contract and not to specific Work Order quantities. Where the Work Order quantity does not reach the required testing frequency, the quantity shall be aggregated with other Work Order quantities from that specific supply source until such time as a test is required. Work Order quantities may be recorded in a materials testing register and testing initiated once the cumulative total for a specific supply source reaches the specified figure.

## **WORK PREPARATION**

### **Plant Requirements**

Job truck (with water)

Trucks

Excavator / backhoe / gradall / loader

Grader

Pavement breaker

Vibrating compactor / wacker packer

Emulsion sprayer

### **Materials**

Cover Aggregate to MRTS22 *Supply of Cover Aggregate*

Bitumen to MRTS17 *Bitumen and Multigrade Bitumen*

Dense Graded and Open Graded Asphalt Pavements to MRTS30 *Asphalt Pavements*

Emulsion to MRTS21 *Bituminous Emulsion*

Plant-mix stabilised pavement

Selected shoulder material, as required

### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Operator

Truck drivers

Traffic controllers            2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the location of the area to be repaired.
6. Check for services, e.g. overhead wires and buried services. Mark these, as appropriate.

7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these, and
8. Arrange and specify a disposal area for excavated material.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. should be marked out already.
3. Excavate for the repair:
  - a. supervisor to mark out (or specify) area to excavated, and
  - b. truck surplus excavated material to site specified by your supervisor.
4. Install geotextile and/or rockfill, as required.
5. Replace fill and pavement:
  - a. premix backfill material and water off-site
  - b. bring material to right moisture content for compaction
  - c. uniform 75 – 100 mm layers, and
  - d. check compaction.
6. Apply seal or asphalt surfacing:
  - a. use Activity Number 118, steps 5 to 12, or Activity Number 155, steps 4 to 7.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
9. Remove traffic control:
  - a. clean / repair, as necessary.

### **427 Maintenance of Cultural Heritage Site**

#### **Description**

All work necessary to maintain designated Cultural Heritage site, including restoration of the site to an acceptable condition. Includes cost of necessary traffic control.



**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
427	Maintenance of Cultural Heritage Site	Metres

No other details are included in the Maintenance Activity Standard for this Activity.

**429 Other Roadside Work****Description**

Any work carried out on the roadside not covered by Activity Numbers 328, 420, 421, 422, 423, 424, 425 and 426.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-Mixed Heavily Bound (Cemented) Pavements</i>
MRTS11	<i>Sprayed Bituminous Treatments (Excluding Emulsion)</i>
MRTS12	<i>Sprayed Bituminous Emulsion Surfacing</i>
MRTS17	<i>Bitumen and Multigrade Bitumen</i>
MRTS19	<i>Cutter Oils</i>
MRTS21	<i>Bituminous Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
429	Other Roadside Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**430 Service Restoration****Description**

All work necessary to restore the roadway to an acceptable condition resulting from works undertaken by Service Authorities in the road reserve. Includes cost of necessary traffic control.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
430	Service Restoration	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**439 Other Restoration Work****Description**

Any other restoration work done not covered by Activity Numbers 430 and 452.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
439	Other Restoration Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**440 Rest Area Servicing****Description**

The servicing of all aspects (excluding pavement / seal, vegetation and sign defects) of rest areas controlled by the department, necessary for the safety and convenience of the public.

**Work Operations**

The following activities shall be included as part of the above Activity:

- site establishment and disestablishment of all plant, labour and materials
- determination of the work area
- clean and maintain toilet facilities
- remove all graffiti
- empty garbage bins
- report any illegal campers (a list of campers is to be kept and forwarded at regular intervals to the Principal)
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order

- clean up of rest area, including the disposal of any waste materials in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- prompt notification to the Principal of illegally camped persons.

### Applicable Specifications

Rest areas shall be regularly inspected and serviced to ensure that the Restoration Standards set out below are met at all times.

### Restoration Standards

All defects in rest areas shall be rectified, as follows:

- Toilet facilities - Clean and functioning.
- Graffiti - Removed - Damaged paintwork repainted.
- Pavement defects - Note included in Sealed Roadway Maintenance.
- Vegetation Activities - Completed as per:
  - 401 Tractor Slashing – Rural
  - 402 Tractor Slashing – Urban
  - 404 Hand Mowing
  - 405 Clearing, and
  - 407 Herbicide Spraying.
- Signing defects - Repaired as per:
  - 424 Removal of Unauthorised Signs
  - 501 Install New, Relocate or Replace Existing Signs  $\leq 1 \text{ m}^2$  (excluding Guide Signs)
  - 502 Repair Signs  $\leq 1 \text{ m}^2$  (excluding Guide Signs)
  - 504 Cleaning Signs, and
  - 506 Repair Guide Signs.
- Empty garbage bins.
- Site tidy - Litter removed.
- Buildings and furniture defects requiring repairs and painting - Record and report for Additional Maintenance.
- Any illegal campers reported to the relevant authority.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
440	Rest Area Servicing	Dollars

### Testing Requirements

None listed.

### **Particular Planning Points to Consider**

1. Define the rest area for repair.
2. Check all aspects of the rest area weekly:
  - a. operation of the toilet facilities
  - b. presence of graffiti
  - c. condition of chairs, tables and fireplaces
  - d. condition of access roads
  - e. presence of overhanging branches likely to fall
  - f. long grass
  - g. rest area signing, and
  - h. illegally camped occupants.
3. Specify and organise the appropriate plant, materials and crew (including quantities of materials).
4. Is a specialist subcontractor required for works, e.g. plumber?

### **441 Driver Reviver Site Servicing**

#### **Description**

The servicing of all aspects (excluding pavement / seal defects) of nominated Driver Reviver sites controlled by the department, necessary for the safety and convenience of the public and public amenity. Does not include reviver sites established in rest areas controlled by the department - See Activity Number 440.

#### **Applicable Specifications**

Driver Reviver sites shall be regularly inspected and serviced to ensure that the Restoration Standards set out below are met at all times.

#### **Restoration Standards**

All defects in Driver Reviver sites shall be rectified, as follows:

- Graffiti - Removed - Damaged paintwork repainted.
- Pavement defects - Note included in Sealed Roadway Maintenance.
- Vegetation Activities - Completed as per:
  - 401 Tractor Slashing - Rural
  - 402 Tractor Slashing - Urban
  - 404 Hand Mowing
  - 405 Clearing, and
  - 407 Herbicide Spraying.

- Signing defects - Repaired as per:
  - 424 Removal of Unauthorised Signs
  - 501 Install New, Relocate or Replace Existing Signs  $\leq 1 \text{ m}^2$  (excluding Guide Signs)
  - 502 Repair Signs  $\leq 1 \text{ m}^2$  (excluding Guide Signs)
  - 504 Cleaning Signs, and
  - 506 Repair Guide Signs.
- Empty garbage bins.
- Site tidy - Litter removed.
- Buildings and furniture defects requiring repairs and painting – Record and report for Additional Maintenance.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
441	Driver Reviver Site Servicing	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

#### Testing Requirements

None listed.

#### Particular Planning Points to Consider

1. Define the reviver site for servicing.
2. Check all aspects of the site on a regular basis before and while in use:
  - a. presence of graffiti
  - b. condition of chairs, tables and fireplaces, if appropriate
  - c. condition of access roads
  - d. presence of overhanging branches likely to fall
  - e. long grass
  - f. signing, and
  - g. litter.
3. Specify and organise the appropriate plant, materials and crew (including quantities of materials).

#### 449 Other Services Work

##### Description

The work involved with any other roadside service type Activity undertaken in addition to that associated with Activity Numbers 440 and 441.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
449	Other Services Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**450 Call Out Service****Description**

Activities undertaken following a call out, by the police or other recognised authority, to an emergency situation on the Road Network.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
450	Call Out Service	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**452 Emergency Call Out Service****Description**

Activities undertaken following a call out by the police or the Principal or recognised authority, or where, in the opinion of the Contractor, an emergency situation exists, to an emergency situation on the Road Network to make safe and/or prevent further damage to the road / asset.

**Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control (if required)
- determination of the work area
- the rectification of the situation to make the site safe. Does not include more permanent type work. Permanent rectification is to be undertaken using other scheduled Activities according to its respective priority
- the collection, removal from site and the disposal of all litter which is greater in size than 100 cm<sup>2</sup> from the sealed carriageway, particularly tyre pieces
- all other operations included in the Applicable Specifications

- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable, and
- notification to the Principal within 24 hours of the callout.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

The Contractor shall receive and carry out instructions from the person in charge of the emergency situation.

Copies of emergency Work Orders are to accompany the progress claim for that period.

The Emergency Gang shall be:

- mobile within 15 minutes of receiving a call out, and
- on-site as soon as possible after receiving the call.

#### Restoration Standards

The emergency situation shall be addressed to the satisfaction of the police, the Principal's Delegate or other recognised authority.

Notify the Principal if major rectification is required.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
452	Emergency Call Out Service	Dollars

#### Testing Requirements

Nil.

#### Particular Planning Points to Consider

1. Specify the appropriate plant, materials and crew (including quantities of materials) required to be available for call out, and organise these, and
2. Consider if a scheduled Activity is required.

#### 453 Incident Response (RAMC only)

Details to be advised.

#### 455 Call Outs Required as a Result of Normal Defects

Details to be advised.

**460 Management of Declared Plants****Description**

All work necessary to manage the eradication of declared plants. Includes cost of necessary traffic control.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
460	Management of Declared Plants	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**500 ROAD FURNITURE****501 Install New, Relocate or Replace Existing Signs  $\leq 1 \text{ m}^2$  (excluding Guide Signs)****Description**

The installation of new relocate or replace information, hazard, regulatory and warning signs, including the supply of parts and fittings supports. Work under this Activity applies to signs with a face area of less than or equal to  $1 \text{ m}^2$  supported on one post support. It does not include work carried out to guide signs, signs greater than  $1 \text{ m}^2$  or signs requiring more than one post. Activity Numbers 503, 505 or 507 are to be used for the excluded works. Includes a new sign at a new location or the installation of a new sign where both the sign (i.e. face) and support of an existing sign are damaged to the extent that they cannot be repaired (i.e. a new post and sign is required), or relocate existing sign.

**Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control (if required)
- determination of the work area
- the supply and installation of a new sign and supports, including fittings, footings etc
- the removal of damaged components where the sign and structure are being replaced, including storage and disposal (if required)
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.



Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS70	<i>Concrete</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

The design of all new footings shall be approved by the Principal's Delegate.

Notwithstanding the requirements of MRTS14 *Road Furniture*, supply of road signs and installation of road signs will be measured, as specified below, for the Activity item or work item. The class of the sign sheeting shall be in accordance with Clause 13 of MRTS14 *Road Furniture*.

### Restoration Standards

The sign and its support structure shall be erected to the requirements of MRTS14 *Road Furniture* and MRTS02 *Provision for Traffic*.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
501	Install New, Relocate or Replace Existing Signs $\leq 1 \text{ m}^2$ (excluding Guide Signs)	Each (Sign)

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
	Supply of road signs	$\text{m}^{2*}$
	Installation of road signs* ( $\text{m}^2$ of sign face)	$\text{m}^{2*}$

### Testing Requirements

Minimum Test Frequency	
<b>Geometrics</b>	
<ul style="list-style-type: none"> <li>• Footings</li> <li>• Diameter, Depth, Transverse location</li> </ul>	1 / Footing
Posts – Location	1 / Post
<b>Sign Placement</b>	
Longitudinal Placement	1 / Sign
Transverse Location	1 / Sign
Height	1 / Sign
Orientation	1 / Sign
Maximum Lot Size	Work Order

### Particular Planning Points to Consider

1. Define location of the new sign.
2. Check that no work is planned in the immediate future that would make the sign unnecessary in that location.
3. Specify and organise the appropriate plant, materials and crew (including quantities of material).
4. Check that the sign is in stock. If not, order one and allow for the delay in supply, and
5. Make sure that the new sign location will not obscure vision.

### 502 Repair Signs $\leq 1 \text{ m}^2$ (excluding Guide Signs)

#### Description

The repair of damaged signs and/or supports or replacement of signs with deteriorated faces, excluding guide signs. Includes the replacement of damaged or deteriorated facilities with new signs and/or supports at that location. Applies to signs with a face area of less than or equal to  $1 \text{ m}^2$  supported on one post support.

#### Work Operations

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control (if required)
- determination of the work area
- the removal of the damaged or worn components, including storage (if required) and disposal
- the supply and installation of a new sign and supports, including fittings, footings etc, as required, in order to replace worn or damaged components
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control</i>

Notwithstanding the requirements of MRTS14 *Road Furniture*, removal and re-erection of signs, supply of road signs and installation of road signs will be measured, as specified below, for the Activity item or work item. The class of the sign sheeting shall be in accordance with Clause 13 of MRTS14 *Road Furniture*.

### Restoration Standards

The sign and/or its support structure shall be repaired or replaced to the standards specified in MRTS14 *Road Furniture*, Queensland *Manual of Uniform Traffic Control Devices* (MUTCD) and the Supplementary Specification.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
502	Repair Signs $\leq 1 \text{ m}^2$ (excluding Guide Signs)	Each (Sign) / Dollars

### Testing Requirements

As per Activity Number 501, where applicable.

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
	Repair of signs	Each (Sign)
	Replacement of signs* ( $\text{m}^2$ of sign face)	$\text{m}^{2*}$

### Particular Planning Points to Consider

1. Examine the sign and its support. Check legibility, reflectivity, location, visibility, damage and alignment.
2. Should they be repaired or replaced? Can they be repaired off-site and stored for later use? Should they be relocated?
3. Check that no work is planned in the immediate future that could make the sign unnecessary in that location.
4. Specify and organise the appropriate plant, materials and crew (including quantities of material).
5. Can some of the stored, recovered Principal's materials be reused?
6. Check that the sign is in stock. If not, order one and allow for the delay in supply, and
7. If the existing sign is a regulatory sign, the sign must be replaced immediately after the damaged sign is removed.

### 503 Install New, Relocate or Replace Existing Signs $> 1 \text{ m}^2$ (excluding Guide Signs)

#### Description

The installation of new, relocate or replace information, hazard, regulatory and warning signs, including the supply of parts and fittings supports. Work under this Activity applies to signs with a face area of greater than  $1 \text{ m}^2$  supported on more than one post support. Includes a new sign at a new location or the installation of a new sign where both the sign (i.e. face) and supports of an existing sign

are damaged to the extent that they cannot be repaired (i.e. new posts and sign is required) or relocate existing sign. Activity Numbers 501, 505 or 507 are to be used for the excluded works.

### Work Operations

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control (if required)
- determination of the work area
- the removal of existing sign, posts and/or footings (as required), including restoration of area to match surrounding area
- the storage for re-use of suitable components
- installation of existing sign to area authorised by Principal (including any worn or damaged components)
- installation of new supports, footings, fittings etc, as required
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS70	<i>Concrete</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

The design of all new footings shall be approved by the Principal.

Notwithstanding the requirements of MRTS14 *Road Furniture*, removal and re-erection of signs will be measured, as specified below, for the Activity item or work item.

### Restoration Standards

The sign and its support structure shall be erected to the requirements of MRTS14 *Road Furniture* and the MUTCD.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
503	Install New, Relocate or Replace Existing Signs > 1 m <sup>2</sup> (excluding Guide Signs)	Each (Sign)

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
	Removal and re-erection of signs* (m <sup>2</sup> of sign face)	m <sup>2</sup> *

**Testing Requirements**

Minimum Test Frequency	
<b>Geometrics</b>	
Footings – Diameter, Depth, Transverse, Location	1 / Footing
Posts – Location	1 / Post
<b>Sign Placement</b>	
Longitudinal Placement	1 / Sign
Transverse Location	1 / Sign
Height	1 / Sign
Orientation	1 / Sign
Maximum Lot Size	Work Order

**Particular Planning Points to Consider**

1. Define new location of the sign.
2. Check that no work is planned in the immediate future that would make the sign unnecessary in that location.
3. Specify and organise the appropriate plant, materials and crew (including quantities of material).
4. Check the legibility, reflectivity and damage to the existing sign. If condition is deficient, schedule Activity Number 508 and order another sign, and
5. Make sure that the new sign location will not obscure vision.

**504 Cleaning Signs****Description**

The cleaning of sign faces to remove dirt, graffiti and other contaminants to restore the reflectivity and appearance of signs. May also require the removal of graffiti from the back of the sign.

**Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control (if required)

- determination of the work area
- the cleaning of the sign faces (or backs, if graffiti exists) to remove dirt, graffiti and other contaminants to restore the reflectivity and appearance of signs
- includes supply of all cleaning agents and materials
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

The Contractor shall supply all cleaning agents and materials.

All foreign material shall be removed from the sign face.

Any damage caused by the cleaning process shall be repaired by the Contractor.

#### Restoration Standards

The sign face shall be cleaned in such a way that all dirt and contaminants are removed.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
504	Cleaning Signs	Each (sign)

#### Testing Requirements

Visual inspections only to ensure the Restoration Standards are met.

#### Particular Planning Points to Consider

1. Define the signs for cleaning.
2. What has caused the defect? Schedule another Activity to correct this, if needed (for example, sign too close to unsealed shoulder etc), and
3. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

#### 505 Install New or Replace Existing Guide Signs

##### Description

The supply and installation of new guide signs, including posts and fittings, where none previously existed, as authorised by the Principal. See Activity Number 501 for the installation of other sign types.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS70	<i>Concrete</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

The design of all new footings shall be approved by the Principal.

Notwithstanding the requirements of MRTS14 *Road Furniture*, removal and re-erection of signs, supply of road signs and installation of road signs will be measured, as specified below, for the Activity item or work item. The class of the sign sheeting shall be in accordance with Clause 13 of MRTS14 *Road Furniture*.

**Restoration Standards**

The sign and its support structure shall be erected to the requirements of MRTS14 *Road Furniture* and the MUTCD.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
505	Install New or Replace Existing Guide Signs	Dollars

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
	Supply of road signs	m <sup>2*</sup>
	Installation of road signs* (m <sup>2</sup> of sign face)	m <sup>2*</sup>

**Testing Requirements**

Minimum Test Frequency	
<b>Geometrics</b>	
Footings – Diameter, Depth, Transverse, Location	1 / Footing
Posts – Location	1 / Post
<b>Sign Placement</b>	
Longitudinal Placement	1 / Sign
Transverse Location	1 / Sign
Height	1 / Sign
Orientation	1 / Sign
Maximum Lot Size	Work Order

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Mobile crane

Excavating equipment

### **Materials**

Concrete (premix or materials)

Signs

Support structure

Miscellaneous (brackets, bolts, screws, paint)

### **Manpower Requirements**

Leading hand                    1

Labourers                        1 - 3

Operators                        As required

Traffic controllers            As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Define location of the new sign.
2. Check that no work is planned in the immediate future that would make the sign unnecessary in that location.
3. Specify and organise the appropriate plant, materials and crew (including quantities of material).
4. Check that the sign is in stock. If not, order one and allow for the delay in supply, and
5. Make sure that the new sign location will not obscure vision.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.



2. Determine the work area:
  - a. from supervisor's instructions.
3. Remove existing sign and/or support structure (if required).
4. Install support structure:
  - a. ensure support structure is firmly embedded or held.
5. Attach new or relocated sign to support structure.
6. Check the work against the Restoration Standards.
7. Leave work site safe and tidy:
  - a. remove all loose material.
8. Remove traffic control:
  - a. clean / repair, as necessary.

## **506 Repair Guide Signs**

### **Description**

The repair of damaged or deteriorated guide sign faces and supports. Includes the replacement of damaged or deteriorated facilities with new signs and/or supports at that location. Excludes regulatory, warning and hazard signs (included under Activity Number 502 or 508).

### **Work Operations**

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control (if required)
- determination of the work area
- the removal of damaged or worn components, including storage (if required) and disposal
- the supply of information to the Principal regarding the design of new signs, including survey information if breakaway bases are required
- the supply and installation of a new sign and supports, including fittings, footings (including the supply, manufacture and installation of breakaway bases, if required) etc, in order to replace worn or damaged components. May include the refacing of the sign if the sign is structurally intact or can be easily repaired
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

Notwithstanding the requirements of MRTS14 *Road Furniture*, removal and re-erection of signs, supply of road signs and installation of road signs will be measured, as specified below, for the Activity item or work item. The class of the sign sheeting shall be in accordance with Clause 13 of MRTS14 *Road Furniture*.

Works which require the sign face to be replaced must firstly be approved by the Principal. Signs subject to this approval shall have all damaged components collected and stored at the Contractor's depot during the approval process.

**Restoration Standards**

The sign and/or its support structure shall be repaired or replaced to the standards specified in MRTS14 *Road Furniture*, the MUTCD and the Supplementary Specification.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
506	Repair Guide Signs	Dollars

**Testing Requirements**

As per Activity Number 501, where applicable.

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
	Repair of signs	Each
	Replacement of signs* (m <sup>2</sup> of sign face)	m <sup>2*</sup>

**Particular Planning Points to Consider**

1. Examine the sign and its support. Check legibility, reflectivity, location, visibility, damage and alignment. Should they be repaired or replaced? Can they be repaired off-site and stored for later use? Should they be relocated?
2. Check that no work is planned in the immediate future that could make the sign unnecessary in that location.
3. Specify and organise the appropriate plant, materials and crew (including quantities of material), and
4. Check that the sign is in stock. If not, order one and allow for the delay in supply.

**507 Relocate Guide Signs****Description**

All work associated with the relocation of existing guide signs as authorised by the Principal. See Activity Number 503 for the relocation of other types of signs.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS70	<i>Concrete</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

The design of all new footings shall be approved by the Principal.

Notwithstanding the requirements of MRTS14 *Road Furniture*, removal and re-erection of signs will be measured, as specified below, for the Activity item or work item.

**Restoration Standards**

The sign and its support structure shall be erected to the requirements of MRTS14 *Road Furniture* and the MUTCD.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
507	Relocate Guide Signs	Dollars

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
	Removal and re-erection of sign* (m <sup>2</sup> of sign face)	m <sup>2</sup> *

**Testing Requirements**

Minimum Test Frequency	
<b>Geometrics</b>	
Footings – Diameter, Depth, Transverse, Location	1 / Footing
Posts – Location	1 / Post
<b>Sign Placement</b>	
Longitudinal Placement	1 / Sign
Transverse Location	1 / Sign
Height	1 / Sign
Orientation	1 / Sign
Maximum Lot Size	Work Order

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Mobile crane

Excavating equipment

### **Materials**

Concrete (premix or materials)

Signs

Support structure

Miscellaneous (brackets, bolts, screws, paint)

### **Manpower Requirements**

Leading hand                    1

Labourers                        1 - 3

Operators                        As required

Traffic controllers            As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Define new location of the sign.
2. Check that no work is planned in the immediate future that would make the sign unnecessary in that location.
3. Specify and organise the appropriate plant, materials and crew (including quantities of material).
4. Check the legibility, reflectivity and damage to the existing sign. If condition is deficient, schedule Activity Number 506 and order another sign, and
5. Make sure that the new sign location will not obscure vision.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.

2. Determine the work area:
  - a. from supervisor's instructions.
3. Remove existing sign and/or support structure (if required).
4. Install support structure at new location:
  - a. ensure support structure is firmly embedded or held.
5. Attach relocated sign to support structure.
6. Check the work against the Restoration Standards.
7. Leave work site safe and tidy:
  - a. remove all loose material.
8. Remove traffic control:
  - a. clean / repair, as necessary.

#### **508 Repair Signs > 1 m<sup>2</sup> (excluding Guide Signs)**

##### **Description**

The repair of damaged signs and/or supports or replacement of signs with deteriorated faces, excluding guide signs. Includes the replacement of damaged or deteriorated facilities with new signs and/or supports at that location. Applies to signs with a face area of greater than 1 m<sup>2</sup> supported on more than one post support.

##### **Work Operations**

The following operations shall be included as part of the above Activity:

- Site establishment and disestablishment of all plant labour and materials
- Establishment and disestablishment of traffic control (if required)
- Determination of the work area
- Removal of the damaged or worn components, including storage (if required) and disposal
- Supply and installation of a new sign and supports, including fittings, footings etc, as required, in order to replace worn or damaged components
- All other operations included in the Applicable Specifications
- Certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- Clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

Notwithstanding the requirements of MRTS14 *Road Furniture*, removal and re-erection of signs, supply of road signs and installation of road signs will be measured, as specified below, for the Activity item or work item. The class of the sign sheeting shall be in accordance with Clause 13 of MRTS14 *Road Furniture*.

**Restoration Standards**

The sign and/or its support structure shall be repaired or replaced to the standards specified in MRTS14 *Road Furniture*, *Queensland Manual of Uniform Traffic Control Devices* (MUTCD).

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
508	Repair Signs > 1 m <sup>2</sup> (excluding Guide Signs)	Each (Sign) / Dollars

**Testing Requirements**

As per Activity Number 501, where applicable.

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
	Repair of Signs	Each (Sign)
	Replacement of Signs* (m <sup>2</sup> of sign face)	m <sup>2</sup> *

**Particular Planning Points to Consider**

1. Examine the sign and its support. Check legibility, reflectivity, location, visibility, damage and alignment.
2. Should they be repaired or replaced? Can they be repaired off-site and stored for later use? Should they be relocated?
3. Check that no work is planned in the immediate future that could make the sign unnecessary in that location.
4. Specify and organise the appropriate plan, materials and crew (including quantities of material).
5. Can some of the stored, recovered Principal's materials be reused?
6. Check that the sign is in stock. If not, order one and allow for the delay in supply, and
7. If the existing sign is a regulatory sign, the sign must be replaced immediately after the damaged sign is removed.

**509 Other Sign Work****Description**

All other sign work not covered by Activity Numbers 501, 502, 503, 504, 505, 506, 507 and 508.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
SS	Supplementary Specification

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
509	Other Sign Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**510 Install New Guide Markers****Description**

The supply and installation of guide markers to delineate the road alignment.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

Delineators shall conform to the requirements of AS 1906.2 *Retroreflective materials and devices for road traffic control purposes, Part 2: Retroreflective devices (non-pavement application)* and shall be a type approved by the Principal's Delegate.

**Restoration Standards**

As per the Applicable Specifications.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
510	Install New Guide Markers	Each (Marker)

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Excavating tools

### **Materials**

Guide markers as per MRTS14 *Road Furniture*

Delineators (if applicable) as per MRTS14 *Road Furniture*

Road-marking paint as per MRTS14 *Road Furniture*

Road-marking template

### **Manpower Requirements**

Leading hand                    1

Labourers                        1 - 3

Traffic controllers            As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

8. Define the area requiring guide markers
9. Check if other maintenance or construction is scheduled for the area of the defect, and
10. Specify and organise the appropriate plant, material and crew (including quantities of materials).

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Determine the location of guide markers:
  - a. spacing for curves and straights, and
  - b. ensure spacing is reduced sufficiently such that the next marker can be seen along winding roads.
4. Excavate for markers.



5. Install markers:
  - a. ensure markers are painted white
  - b. ensure delineators are fitted
  - c. ensure oncoming vehicles can view red delineators on left and white delineators on right
  - d. backfill excavation and compact
  - e. vertical, and
  - f. if shoulders are unsealed, adopt 1000 mm above the level of the edge line or edge of bituminous surfacing for delineator height.
6. Mark adjacent pavement:
  - a. use template.
7. Check the work against the Restoration Standards.
8. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
9. Remove traffic control:
  - a. clean / repair, as necessary.

#### 511 Clean and/or Paint Guide Markers

##### Description

The cleaning of guide markers to remove dirt and other contaminants and restore their white colour.

##### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
SS	Supplementary Specification

##### Restoration Standards

The guide marker shall be cleaned such that all dirt and contaminants are removed and/or the marker repainted, as specified in MRTS14 *Road Furniture*, the MUTCD and the Supplementary Specification.

##### Activity Items and Units of Measurement

Item	Description	Units of Measurement
511	Clean and/or Paint Guide Markers	Each (Marker)

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Cleaning tools

### **Materials**

Paint as per MRTS14 *Road Furniture*

Mild detergent

### **Manpower Requirements**

Leading hand                    1

Labourers                        1 - 3

Traffic controllers            As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Define the area requiring guide markers to be cleaned.
2. Check if other maintenance or construction is scheduled for the area of the defect.
3. Specify and organise the appropriate plant, materials and crew (including quantities of materials).
4. If defective delineators are to be repaired at the same time, schedule an Activity for the work, and
5. If missing guide markers are to be replaced, schedule an Activity for the work.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Treat guide markers:
  - a. if paint is in sound condition, wash markers
  - b. if paint is flaking, remove flakes by wire brushing, then paint, and
  - c. do not paint over delineators.

4. Missing / defective markers:
  - a. if markers are missing or delineators are defective and works are not ordered, advise supervisor.
5. Adjacent pavement markers:
  - a. ensure painted location mark exists on adjacent pavement.
6. Check the work against the Restoration Standards.
7. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
8. Remove traffic control:
  - a. clean / repair, as necessary.

## 512 Repair or Replace Guide Markers

### Description

The repair or replacement of guide markers or their respective components to restore delineation of the road alignment. Excludes raised pavement markers - See Activity Number 740.

### Work Operations

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control (if required)
- determination of the work area
- the removal of the damaged or worn components and disposal
- the supply and installation of new components, including fittings
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

The repair of guide markers shall consist of restoring the posts to the vertical position and replacing delineators, if applicable.

Delineators shall conform to the requirements of AS 1906.2 *Retroreflective materials and devices for road traffic control purposes* and shall be a type approved by the Principal's Delegate.

### Restoration Standards

The guide marker shall be repaired or replaced to the requirements specified for road edge guide posts in MRTS14 *Road Furniture*, the MUTCD, Supplementary Specification, and as per Applicable Specifications.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
512	Repair or Replace Guide Markers	Each (Marker)

### Testing Requirements

Visual inspections to ensure the Restoration Standards are met.

### Supplementary Work Items and Units of Measurement

Item	Description	Units of Measurement
-	Repair guide markers	Each
-	Replace guide markers	Each

### Particular Planning Points to Consider

1. Define the area requiring the repair or replacement of guide markers.
2. What has caused the defect? Schedule another Activity if this is needed.
3. Check no other maintenance or permanent work is scheduled for the area of the defect, and
4. Specify and organise the appropriate plant, material and crew (including quantities of materials).

### 513 Replace Guide Post Delineators

#### Description

The replacement of guide post delineators to restore delineation of the road alignment.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

Delineators shall conform to the requirements of AS 1906.2 *Retroreflective materials and devices for road traffic control purposes* and shall be a type approved by the Principal's Delegate.

**Restoration Standards**

The delineators shall be repaired or replaced to the requirements specified in MRTS14 *Road Furniture*, the MUTCD, and as per Applicable Specifications.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
513	Replace Guide Post Delineators	Each (Delineator)

**WORK PREPARATION****Plant Requirements**

Job truck

Excavating tools

**Materials**

Guide markers

Delineators (if applicable)

Road-marking paint

Road-marking template

**Manpower Requirements**

Leading hand 1

Labourers 1 - 3

Traffic controllers As required

**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. Define the area requiring the repair or replacement of guide markers.
2. What has caused the defect? Schedule another Activity if this is needed.
3. Check no other maintenance or construction is scheduled for the area of the defect, and
4. Specify and organise the appropriate plant, material and crew (including quantities of materials).

**WORK PROCEDURES****Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and

- d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Replace delineators:
  - a. remove existing markers (if applicable)
  - b. replace existing delineator, if necessary
  - c. ensure oncoming vehicles can view red delineators on left and white delineators on right
  - d. backfill excavation and compact
  - e. ensure guide post is vertical, and
  - f. if shoulders are unsealed, adopt 1000 mm above the level of the edge line or edge of bituminous surfacing for delineator height.
4. Adjacent pavement markings:
  - a. ensure painted location mark exists on adjacent pavement.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
7. Remove traffic control:
  - a. clean / repair, as necessary.

#### 514 Repair Guide Markers

##### Description

The repair of guide markers shall consist of restoring the posts to the vertical position.

##### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
-	Standard Drawing Numbers 1356 and 1357

##### Restoration Standards

The guide marker shall be repaired to the requirements specified for road edge guide posts in MRTS14 *Road Furniture*, Standard Drawing Numbers 1356 and 1357, and the MUTCD.

##### Activity Items and Units of Measurement

Item	Description	Units of Measurement
514	Repair Guide Markers	Each (Marker)

**Testing Requirements**

Minimum Test Frequency	
Geometrics	
Height	Each (Post)
Vertical	Each (Post)
Horizontal	Each (Post)

**Particular Planning Points to Consider**

1. Define the area requiring the repair of guide markers
2. What has caused the defect? Schedule another Activity if this is needed.
3. Check no other maintenance or permanent work is scheduled for the area of the defect, and
4. Specify and organise the appropriate plant, material and crew (including quantities of materials).

**515 Replace Guide Markers****Description**

The replacement of guide markers to restore delineation of the road alignment.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
-	Standard Drawing Numbers 1356 and 1357

Delineators shall conform to the requirements of AS 1906.2 *Retroreflective materials and devices for road traffic control purposes* and shall be a type approved by the Principal's Delegate.

**Restoration Standards**

The guide marker shall be replaced in accordance with the requirements specified for road edge guideposts in MRTS14 *Road Furniture*, Standard Drawing Numbers 1356 and 1357, and the MUTCD.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
515	Replace Guide Markers	Each (Marker)

No other details are included in the Maintenance Activity Standard for this Activity.

**Testing Requirements**

Minimum Test Frequency	
Geometrics	
Height	Each (Post)

Minimum Test Frequency	
Vertical	Each (Post)
Horizontal	Each (Post)

## WORK PREPARATION

### Materials

Guide markers as per MRTS14 *Road Furniture*

Delineators (if applicable) as per MRTS14 *Road Furniture*

### Particular Planning Points to Consider

1. Define the area requiring the repair or replacement of guide markers.
2. What has caused the defect? Schedule another Activity if this is needed.
3. Check no other maintenance or permanent work is scheduled for the area of the defect, and
4. Specify and organise the appropriate plant, material and crew (including quantities of materials).

## 519 Other Guide Post and Marker Work

### Description

Any other work carried out to guide posts and markers not covered by Activity Numbers 510, 511, 512, 513, 514 and 515.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
519	Other Guide Post and Marker Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

## 520 Install New Guard Rail, Barrier Furniture

### Description

The supply and installation of steel beam guard-rail, including materials, and application of all protective coatings.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

### Restoration Standards

The guard rail shall be erected to the requirements of MRTS14 *Road Furniture* and the MUTCD.



**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
520	Install New Guard Rail, Barrier Furniture	Metres

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
96340	Steel beam guard rail	Metres

**Testing Requirements**

Minimum Test Frequency	
Geometrics	
<ul style="list-style-type: none"> <li>• Footings</li> <li>• Diameter, depth, Transverse location</li> </ul>	1 / Footing
Placement	1 / Section
Longitudinal Placement	1 / Section
Transverse Location	1 / Post
Height	1 / 10 m
Maximum Lot Size	Work Order

**WORK PREPARATION****Plant Requirements**

Job truck

Post driving equipment

Excavating equipment

**Materials**

Concrete (premix or materials)

Guard rail panels and posts as per MRTS14 *Road Furniture*

Miscellaneous (bolts, paint etc)

**Manpower Requirements**

Leading hand 1

Labourers 1 - 3

Operators As required

Traffic controllers As required

**Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Define location of the new guard rail.
2. Check that no work is planned in the immediate future that would make the guard rail unnecessary in that location.
3. Obtain appropriate standard drawing showing installation details.
4. Specify and organise the appropriate plant, materials and crew (including quantities of material), and
5. Check that the guard rail is in stock. If not, order it and allow for the delay in supply.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Install posts:
  - a. set out as per drawings
  - b. correct location and spacing
  - c. correct height, and
  - d. ensure post is firmly embedded.
4. Attach guard rail panels.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### **521 Clean and/or Paint Guard Rail, Barrier Furniture**

#### **Description**

The cleaning of guard rail and barrier furniture to remove dirt and other contaminants and/or its painting.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>

**Restoration Standards**

All dirt and contaminants are removed. The painting shall conform to the requirement of MRTS14 *Road Furniture*.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
521	Clean and/or Paint Guard Rail, Barrier Furniture	Metres

**Testing Requirements**

None listed.

**WORK PREPARATION****Plant Requirements**

Job truck

Water tank

Pressure sprayer

Paint sprayer

**Materials**

Water

Mild detergent

Cleaning rags

Mineral spirits

Paint as per MRTS14 *Road Furniture*

**Manpower Requirements**

Leading hand 1

Labourers 1 - 3

Operators As required

Traffic controllers As required

**Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Define the guard rail / barrier for cleaning / painting.
2. What has caused the defect? Schedule another Activity to correct this, if needed.
3. Make sure no other major maintenance or construction is scheduled for the area of the defect.
4. Are there any related defects, e.g. damaged guard rail?
5. Is an alternative remedy or major maintenance more appropriate?
6. Specify or mark out the length of guard rail / barrier requiring cleaning, and
7. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Clean guard rail / barrier:
  - a. mild detergent solution
  - b. remove residual detergent with clean water, and
  - c. remove peeling paint to sound base.
4. Check for defects in guard rail / barrier:
  - a. if defective or below standard, advise supervisor.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### **522 Repair or Replace Guard Rail, Barrier Furniture**

#### **Description**

The repair or replacement of damaged guard rails / barrier furniture.

## Work Operations

The following operations shall be included as part of the above Activity:

- site establishment and disestablishment of all plant labour and materials
- establishment and disestablishment of traffic control (if required)
- determination of the work area
- the removal of the damaged or worn components, including storage (if required) and disposal
- the supply and installation of new components, including fittings, footings, excavation for footings etc
- all other operations included in the Applicable Specifications
- certification that the product meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance and audit testing. This is to be attached to each Work Order, and
- the clean up of the site, including the disposal of any waste material in accordance with any State Government legislation or Local Government by-laws that are applicable.

Where the terminal end of the guard rail is significantly damaged and requires replacing, a Modified Eccentric Loader Terminal (MELT) end should be used. A joint inspection should take place on-site to determine the repair required.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
	Relevant Standard Drawings

The work shall include:

- a) removal of damaged guard rail components
- b) supply of new guard rail components
- c) straightening of existing posts
- d) installation of new posts
- e) erection of new guard rail, and
- f) transport of old components to the nearest maintenance depot.

### Restoration Standards

The guard rail and its support structure shall be replaced to the requirements of MRTS14 *Road Furniture* and the MUTCD.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
522	Repair or Replace Guard Rail, Barrier Furniture	Dollars

**Testing Requirements**

The minimum test frequency shall be as per Activity Number 520, where applicable.

**Particular Planning Points to Consider**

1. Define the guard rail / barrier for repair / replacement.
2. What has caused the defect? Schedule another Activity to correct this, if needed.
3. Make sure no other major maintenance or construction is scheduled for the area of the defect.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Specify or mark out the length of guard rail / barrier requiring repair / replacement, and
7. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

**523 Repair Guard Rail, Barrier Furniture****Description**

All works associated with the repair of damaged roadside guard rail or other barrier furniture.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
	Relevant Standard Drawings

The work shall include:

- a) removal of damaged guard rail components
- b) repair of guard rail components
- c) straightening of existing posts
- d) erection of guard rail, and
- e) transport of any old components to the nearest maintenance depot.

**Restoration Standards**

The guard rail and its support structure shall be repaired to the requirements of MRTS14 *Road Furniture* and the MUTCD.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
523	Repair Guard Rail, Barrier Furniture	Metres

**Testing Requirements**

Minimum Test Frequency	
Geometrics	
<ul style="list-style-type: none"> <li>• Footings</li> <li>• Diameter, Depth, Transverse Location</li> </ul>	1 / Footing
Placement	1 / Section
Longitudinal Placement	1 / Section
Transverse Location	1 / Post
Height	1 / 10 m

**WORK PREPARATION****Plant Requirements**

Job truck

Excavating / post driving equipment

**Materials**

Guard rail panels and posts as per MRS14 *Road Furniture*

Miscellaneous (bolts, paint etc)

**Manpower Requirements**

Leading hand 1

Labourers 1 - 3

Operators As required

Traffic controllers As required

**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. Define the guard rail / barrier for repair.
2. What has caused the defect? Schedule another Activity to correct this, if needed.
3. Make sure no other major maintenance or construction is scheduled for the area of the defect.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?

6. Specify or mark out the length of guard rail / barrier requiring repair / replacement, and
7. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

## WORK PROCEDURES

### Sequential Steps and Check Points

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Repair guard rail / barrier:
  - a. straighten posts, and
  - b. replace damaged components.
4. Check if cleaning or painting is required:
  - a. if required, advise supervisor.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### 524 Replace Guard Rail, Barrier Furniture

#### Description

All works associated with the replacement of damaged roadside guard rail or other barrier furniture with new barrier materials.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
	Relevant Standard Drawings



The work shall include:

- a) removal of damaged guard rail components
- b) supply of new guard rail components
- c) straightening of existing posts
- d) installation of new posts
- e) erection of new guard rail, and
- f) transport of old components to the nearest maintenance depot.

### Restoration Standards

The guard rail and its support structure shall be replaced to the requirements of MRTS14 *Road Furniture* and the MUTCD.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
524	Replace Guard Rail, Barrier Furniture	Metres

### Testing Requirements

The minimum test frequency shall be as per Activity Number 520, where applicable.

### WORK PREPARATION

#### Plant Requirements

Job truck

Excavating / post driving equipment

#### Materials

Guard rail panels and posts as per MRTS14 *Road Furniture*

Miscellaneous (bolts, paint etc)

#### Manpower Requirements

Leading hand	1
Labourers	1 - 3
Operators	As required
Traffic controllers	As required

#### Average Daily Production

Not listed.

#### Particular Planning Points to Consider

1. Define the guard rail / barrier for replacement.
2. What has caused the defect? Schedule another Activity to correct this, if needed.
3. Make sure no other major maintenance or construction is scheduled for the area of the defect.

4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Specify or mark out the length of guard rail / barrier requiring replacement, and
7. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

## WORK PROCEDURES

### Sequential Steps and Check Points

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Repair guard rail / barrier:
  - a. straighten posts, and
  - b. replace damaged components.
4. Check if cleaning or painting is required:
  - a. if required, advise supervisor.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### 525 Replace Guard Rail Delineators

#### Description

All works associated with the replacement of defective delineators on roadside guard rail furniture.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
	Relevant Standard Drawings

The work shall include:

- a) removal of damaged guard rail components, delineators
- b) supply of new guard rail components
- c) straightening of existing posts
- d) installation of new components, and
- e) transport of old components to the nearest maintenance depot.

### Restoration Standards

The guard rail component and its support structure shall be restored to the requirements of MRTS14 *Road Furniture* and the MUTCD.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
525	Replace Guard Rail Delineators	Each (Delineator)

### Testing Requirements

Not listed.

### WORK PREPARATION

#### Plant Requirements

Job truck

#### Materials

Delineators as per MRTS14 *Road Furniture*

Miscellaneous (screws etc)

#### Manpower Requirements

Leading hand                    1  
 Labourers                        1 - 2  
 Traffic controllers            As required

#### Average Daily Production

Not listed.

#### Particular Planning Points to Consider

1. Define the delineators for replacement.
2. What has caused the defect? Schedule another Activity to correct this, if needed.
3. Make sure no other major maintenance or construction is scheduled for the area of the defect.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?

6. Specify the guide marker delineators requiring replacement, and
7. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

## WORK PROCEDURES

### Sequential Steps and Check Points

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Replace delineators:
  - a. straighten posts.
4. Check if cleaning or painting is required:
  - a. if required, advise supervisor.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### 530 Repair Wire Rope Barrier

#### Description

All works associated with the repair of damaged roadside wire rope barrier furniture.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
	Relevant Standard Drawings

The work shall include:

- a) removal of damaged barrier components
- b) repair of barrier components
- c) straightening of existing posts

- d) erection of barrier, and
- e) transport of any old components to the nearest maintenance depot.

### Restoration Standards

The wire rope barrier shall be reinstated to the manufacturer's specifications.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
530	Repair Wire Rope Barrier	Metres / Dollars

### Testing Requirements

As per manufacturer's specifications and the minimum test frequency for Activity Number 520, where applicable.

No other details are included in the Maintenance Activity Standard for this Activity.

### 531 Upgrade Existing Barrier End

#### Description

All works associated with the upgrading of barrier ends to current standards.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
	Relevant Standard Drawings

The work shall include:

- a) removal of non-standard barrier end
- b) replacement of barrier end with new to current standard, and
- c) transport of any old components to the nearest maintenance depot.

### Restoration Standards

The barrier end shall be installed to the manufacturer's specifications.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
531	Upgrade Existing Barrier End	Each

No other details are included in the Maintenance Activity Standard for this Activity.

### Testing Requirements

As per manufacturer's specifications and the minimum test frequency for Activity Number 520, where applicable.

**532 Repair Ingal Barrier****Description**

All works associated with the repair of damaged roadside Ingal barrier furniture.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
	Relevant Standard Drawings

The work shall include:

- a) removal of damaged barrier components
- b) repair of barrier components
- c) straightening of existing posts
- d) erection of barrier, and
- e) transport of any old components to the nearest maintenance depot.

**Restoration Standards**

The Ingal barrier shall be reinstated to the manufacturer's specifications.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
532	Repair Ingal Barrier	Metres / Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**Testing Requirements**

As per manufacturer's specifications and the minimum test frequency for Activity Number 520, where applicable.

**533 Upgrade Existing Barrier****Description**

All works associated with the upgrading of existing barrier to current standards.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>
	Relevant Standard Drawings

The work shall include:

- a) removal of non-standard barrier
- b) replacement of barrier with new to current standard, and
- c) transport of any old components to the nearest maintenance depot.

### Restoration Standards

The barrier shall be installed to the manufacturer's specifications.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
533	Upgrade Existing Barrier	Metres

No other details are included in the Maintenance Activity Standard for this Activity.

### Testing Requirements

As per manufacturer's specifications and the minimum test frequency for Activity Number 520, where applicable.

### 534 Repair Impact Barrier Furniture

#### Description

All works associated with the repair of damaged special purpose impact roadside barrier furniture. Does not include the repair to damaged roadside barrier furniture – see Activity Numbers 522, 523, 524, 530 and 532.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

### Restoration Standards

The impact barrier furniture shall be reinstated to the manufacturer's specifications.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
534	Repair Impact Barrier Furniture	Metres / Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### Testing Requirements

As per the manufacturer's specifications.

**550 Emergency Roadside Phone Repairs****Description**

The major repair by replacement of defective roadside emergency roadside phones.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

All phones shall be checked weekly on the first and last working day of the week. Any defective phone unable to be repaired under Activity Number 551 shall be repaired by replacement immediately.

**Restoration Standards**

Emergency phones shall be operating.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
550	Emergency Roadside Phone Repairs	Each (Phone)

**Testing Requirements**

None listed.

**WORK PREPARATION****Plant Requirements**

Job truck

Hand tools

**Materials**

Spare emergency phone

**Manpower Requirements**

Leading hand 1

Labourers 1 - 2

**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. Define the location of phones to be checked.
2. Specify and organise the appropriate plant, material and crew (including quantities of materials), and
3. Emergency phones are to be checked each week on a regular basis.



## WORK PROCEDURES

### Sequential Steps and Check Points

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Check phone connections:
  - a. corrosion on connection, and
  - b. defective handpiece.
4. Remove phone (if applicable):
  - a. install spare phone, and
  - b. check operation by phoning.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### 551 Emergency Roadside Phone Servicing

#### Description

All works associated with the routine servicing of roadside emergency phones. Includes inspections to monitor serviceability of the phones, servicing, and minor repair works to associated fittings.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

All phones shall be checked weekly on the first and last working day of the week for serviceability. Any defective phone shall be serviced and repaired immediately.

#### Restoration Standards

Emergency phones shall be operating.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
551	Emergency Roadside Phone Servicing	Dollars

## **WORK PREPARATION**

### **Plant Requirements**

Job truck (with water)

Hand tools

### **Materials**

None listed.

### **Manpower Requirements**

Leading hand 1

Labourers 1 - 2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Define the location of phones to be checked.
2. Specify and organise the appropriate plant, material and crew (including quantities of materials), and
3. Emergency phones are to be checked each week on a regular basis.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Check phone connections:
  - a. routine service
  - b. corrosion on connection, and
  - c. defective handpiece.
4. Check operation by phoning.
5. Check the work against the Restoration Standards.

6. Leave work site safe and tidy.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### 559 Other Furniture Repairs

#### Description

Any other work carried out to barrier furniture not covered by Activity Numbers 520, 521, 522, 523, 524, 525, 530, 532, 534, 550 and 551.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
559	Other Furniture Repairs	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### 560 Maintenance of Noise Barriers – Minor

Details to be advised.

### 600 LIGHT AND TRAFFIC SIGNALS

#### 601 Replace Traffic Signal Lamps and Clean Lanterns – Bulk Change

#### Description

The replacement of all traffic signal lamps, whether defective or otherwise, and cleaning of lanterns according to a regular maintenance program (Preventative Maintenance).

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
601	Replace Traffic Signal Lamps and Clean Lanterns – Bulk Change	Each (Lamp)

No other details are included in the Maintenance Activity Standard for this Activity.

#### 602 Replace Traffic Signal Defective Lamps and Clean Lanterns – Emergent Change

#### Description

The replacement of any defective lamps and cleaning of lanterns, if necessary, due to fault call-out (Response Maintenance).

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
602	Replace Traffic Signal Defective Lamps and Clean Lanterns – Emergent Change	Each (Lamp)

No other details are included in the Maintenance Activity Standard for this Activity.

**603 Scheduled Install / Replace / Clean Luminaires (and Smart Lighting Controllers (SLC), as applicable) – Route Lighting**

**Description**

This Work Activity covers the scheduled installation / replacement / cleaning of luminaires, including SLC, at roadway, cycleway and pedestrian access lighting installation sites, where directed by the Principal.

**Note:**

For this Work Activity, scheduled refers to the routine (periodic scheduled) maintenance required to be undertaken within the prescribed routine maintenance timeframes, including end of life replacement (i.e. planned Activities).

**Work Operations**

The Work Operations associated with this Work Activity may include, but are not limited to:

Luminaires and SLCs

- a) Install / replace / clean luminaires, including SLC, at a site.

Cleaning

- b) Clean contacts on National Electrical Manufacturer's Association (NEMA) socket on luminaire and contacts on SLC (remove, clean, reinstall).
- c) Clean PE cell window on SLC.
- d) Clean all optical surfaces of the luminaire, both internal and external.
- e) Check gaskets for deterioration and replacement, where necessary.
- f) Replace damaged / weathered diffuser.
- g) Visually check electrical components and wiring for signs of overheating.
- h) Check all accessible screws, nuts and fixings for tightness; where loose / undone, apply non-corrosive gel to screw fixing.
- i) Realign the luminaire as per design, as required.
- j) Clean heatsinks, where fitted.

## General

- k) Check luminaire, including SLC operation,
- l) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- m) Visually check the condition of supporting structures (including outreach arm, including extension arm and outreach arm attachment points) and record the condition ratings (confirm / revise, as appropriate) and associated photos in the department's asset management information system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management information system.

## Applicable Specifications

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS94	<i>Road Lighting</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS228	<i>Electrical Switchboards</i>

## Restoration Standards

The maximum level of luminaire outages at any one time should not be greater than the Principal's specified percentage of the total luminaires, including SLC installations for the location.

The luminaire, including SLC installation, should be reinstated to MRTS94 *Road Lighting* or updated specifications / standards requested by the Principal.

When undertaking the scheduled servicing of luminaires, all maintenance tasks, as specified in Section 7.2 *Lighting of Traffic and Road User Manual (TRUM) Volume 4: ITS and Electrical Technology Manual - Part 2 – Road Lighting Maintenance*, shall be performed and completed in accordance with the above standards.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
603	Sch Install/Replace/Clean Lum (& SLC as applic)(Route Light)	Dollars

**Testing Requirements**

- a) Design specifications to satisfy the requirements of AS/NZS 1158 *Lighting for roads and public spaces*, which specifies luminaire servicing availability of at least 95%, and
- b) Road lighting installation wiring should be in accordance with AS/NZS 3000 *Wiring Rules*.

**Planning Points to Consider**

N/A.

**604      **Unscheduled Install / Replace / Clean Luminaires (and Smart Lighting Controllers (SLC), as applicable) – Route Lighting****

**Description**

This Work Activity covers the unscheduled installation / replacement / cleaning of luminaires, including SLC, at roadway, cycleway and pedestrian access lighting installation sites, and for which the Work Activity has not been scheduled.

**Note:**

For this Work Activity, unscheduled refers to ad hoc (non-periodic) maintenance work that was not planned within the prescribed routine maintenance timeframes (i.e. unplanned Activities).

**Work Operations**

The Work Operations associated with this Activity may include, but are not limited to:

## Luminaires and SLCs

- a) Identify faulty luminaire / SLC.
- b) Confirm diagnosis on-site of a reported failure.
- c) Install / replace / clean luminaire, including SLC.

## Cleaning

- d) Clean contacts on NEMA socket on luminaire and contacts on SLC (remove, clean, reinstall).
- e) Clean PE cell window on SLC.
- f) Clean all optical surfaces of the luminaire, both internal and external.
- g) Check gaskets for deterioration and replacement, where necessary.
- h) Replace damaged / weathered diffuser.
- i) Visually check electrical components and wiring for signs of overheating.
- j) Check all accessible screws, nuts and fixings for tightness; where loose / undone, apply non-corrosive gel to screw fixing.

- k) Realign the luminaire as per design, as required.
- l) Clean heatsinks, where fitted.

#### General

- m) Check luminaire, including SLC operation.
- n) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- o) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the c.

#### Applicable Specifications

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS94	<i>Road Lighting</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS228	<i>Electrical Switchboards</i>

#### Restoration Standards

The maximum level of luminaire outages at any one time should not be greater than the Principal's specified percentage of the total luminaires, including SLC installations, for the location.

The luminaire, including SLC installation, should be reinstated to MRTS94 *Road Lighting* or updated specifications / standards requested by the Principal.

Activities specified in TRUM Volume 4 should be performed.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
604	Unsch Install/Replace/Clean Lum (& SLC as applic)(RouteLght)	Dollars

**Testing Requirements**

- a) Design specifications to satisfy the requirements of AS/NZS 1158 *Lighting for roads and public spaces*, which specifies luminaire servicing availability of at least 95%, and
- b) Road lighting installation wiring should be in accordance with AS/NZS 3000 *Wiring Rules*.

**Planning Points to Consider**

N/A.

**605 Clean Traffic Signal Lanterns – Scheduled – Bulk****Description**

The cleaning of traffic signal lanterns according to a regular maintenance program (Preventative Maintenance).

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
605	Clean Traffic Signal Lanterns – Scheduled – Bulk	Each (Lamp)

No other details are included in the Maintenance Activity Standard for this Activity.

**606 Modify Traffic Signals – Add Lanterns****Description**

The modification of existing traffic signals or installation of extra lanterns to existing posts, poles or outreaches, including:

- disconnection of existing loop wire from detector feed cable
- cutting of new loop slot
- placing of new loop wire
- filling of slot after cleaning, and
- jointing of new loop wire to existing detector feed cable.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
606	Modify Traffic Signals – Add Lanterns	Each (Lantern)

No other details are included in the Maintenance Activity Standard for this Activity.



**607 Modify Traffic Signals – Remove Lanterns****Description**

The removal of lanterns from posts, poles or outreaches, including:

- disconnecting lantern cable cores from final terminals, and
- removal of lantern, including straps.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
607	Modify Traffic Signals – Remove Lanterns	Each (Lantern)

No other details are included in the Maintenance Activity Standard for this Activity.

**608 Luminaires (excluding Route Lighting), Solar Lighting and Arrays****Description**

This Work Activity covers all luminaire lighting work, including cleaning, associated with:

- a) luminaire lighting installations at locations other than roadway, cycleway and pedestrian access locations, and
- b) solar lighting installations, including solar arrays.

**Note:**

For this Work Activity, servicing refers to rectification of identified defects / deficiencies.

**Work Operations**

The Work Operations associated with this Work Activity may include, but are not limited to:

## Luminaires

- a) Installation / replacement / cleaning of all luminaire components / parts, as required.
- b) Reinstall the luminaire installation to the original operational condition. Test and commission the lighting installation, as required, ensuring the control system is operational as per design (if applicable).
- c) Decorative, solar and navigational luminaire lighting should be undertaken upon the Principal request.

## Cleaning

- d) Clean all lamps and optical surfaces of the luminaire, both internal and external.
- e) Check gaskets for deterioration and replacement, where necessary.
- f) Replace damaged / weathered diffuser.
- g) Visually check electrical components and wiring for signs of overheating.

- h) Check all accessible screws, nuts and fixings for tightness; where loose / undone, apply non-corrosive gel to screw fixing.
- i) Realign the luminaire as per design, as required.
- j) Clean heatsinks, where fitted.

#### General

- k) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- l) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

#### Applicable Specifications

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS94	<i>Road Lighting</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS228	<i>Electrical Switchboards</i>

#### Restoration Standards

The maximum level of luminaire outages at any one time should not be greater than the Principal's specified percentage of the total luminaire installations for the location.

The luminaire installation should be reinstated to MRTS94 *Road Lighting* or updated specifications / standards requested by the Principal.

Activities specified in TRUM Volume 4 should be performed.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
608	Luminaires (excl. Route Lighting), Solar Lighting and Arrays	Dollars

**Testing Requirements**

- a) The lighting installation wiring should be in accordance with AS/NZS 3000 *Wiring Rules*, and
- b) The solar array installation testing should be in accordance with AS/NZS 3000 *Wiring Rules*, AS/NZS 5033 *Installation and safety requirements for photovoltaic (PV) arrays* and AS/NZS 4777 *Grid connection of energy systems via inverters*.

**Planning Points to Consider**

N/A.

**609 Light and Power Infrastructure (excluding Luminaires / Smart Lighting Controllers (SLC) / Lamps)****Description**

This Work Activity covers:

- a) All non-emergency, unscheduled maintenance of all electrical and structural infrastructure which serves to enable lighting. This includes mounting structures (poles, footings), pole labelling and associated power infrastructure (electrical cabling, switchboard, points of supply, pits and ducting).
- b) The scope of this Activity is to remedy equipment defects and faults (except for priority group 1 faults, as defined in the Intervention Levels and response times (IL/RT) criteria (see Chapter 4 of these *Routine Maintenance Guidelines*)).

**Note:**

For this Work Activity, unscheduled refers to ad hoc (non-periodic) maintenance work that was not planned within the prescribed routine maintenance timeframes (i.e. unplanned Activities).

- c) The replacement of road lighting enabling infrastructure (structural, electrical) as a result of degradation caused by age or environmental factors. Costs associated with planning, scoping and estimating of works are also to be captured in the appropriate Activity. The Contractor shall provide an estimate of the works to the Principal for approval, prior to works being undertaken, and
- d) The end of life replacement of road lighting enabling infrastructure (structural, electrical), as directed by the Principal.

**Work Operations**

The Work Operations associated with this Work Activity may include, but are not limited to:

Switchboards and cables

- a) Replacement of any required parts or lighting circuit faults associated with the switchboards and cables, including control and monitoring system (CMS) faults.

## Lighting and power infrastructure

- b) Visual inspection of the lighting installations for loose components.
- c) Inspection and identification of poles for replacement if deformation exceeds design limits.
- d) Replacement of defective / missing pole labelling, if required, in accordance with *Road Planning and Design Manual – Volume 6 – Lighting*.
- e) Maintenance and replacement of any lighting structural components, including poles and footings.
- f) General maintenance of lighting installations, including the supply, repair and installation of hardware required for the normal operation of such infrastructure.

## General

- g) Provide the department with the As Constructed drawing revision.
- h) The electrical installation should be reinstated to the applicable MRTS and standard drawing(s) for the installation or updated specifications and standards, if requested by the Principal.
- i) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- j) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

**Applicable Specifications**

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS94	<i>Road Lighting</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS228	<i>Electrical Switchboards</i>

### Restoration Standards

The maximum level of luminaire outages at any one time should not be greater than the Principal's specified percentage of the total luminaire lighting installation for the location.

The luminaire lighting installations should be reinstated to *MRTS94 Road Lighting* or updated specifications / standards requested by the Principal.

Activities specified in *TRUM* Volume 4 should be performed.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
609	Light & Power Infrastructure (excl. Luminaires/SLCs/Lamps)	Dollars

### Testing Requirements

- a) The road lighting installations should be tested in accordance with *MRTS94 Road Lighting*.
- b) Lighting should be maintained in accordance with *AS/NZS 1158 Lighting for roads and public spaces*.
- c) The road lighting installation wiring should be in accordance with *AS/NZS 3000 Wiring Rules*, and
- d) Electrical Test Certificate should be supplied, where required.

### Planning Points to Consider

N/A.

### 610 Traffic Signal Operational and Controller Inspection and Service

#### Description

This Work Activity covers the inspection and, where appropriate, service of the traffic signal installation, including the controller and controller housing enclosure, to ensure the signal site is operating safely and efficiently and that the signal cabinets are in appropriate condition to house the traffic signal controller.

#### Note:

For this Work Activity, servicing refers to rectification of identified defects / deficiencies, while inspection refers to no rectification work.

#### Work Operations

The Work Operations associated with this Work Activity include checking the safe and efficient functional operation of the traffic signal installation and identifying any defects to any of the traffic signal components or functions for rectification. These may include, but are not limited to, inspecting / checking for the following:

- a) Correct lantern alignment and functionality
- b) Check for and identify any damaged lanterns, luminaires, damaged visors (cowls) and/or damaged lenses
- c) Check all detectors (vehicle, bicycle and pedestrian detectors) are functioning correctly

- d) Where installed, check all special inputs and outputs are functioning correctly
- e) Where installed, check all other equipment is connected to the controller correctly
- f) Ensure site identifier is clearly legible
- g) Check the traffic signal cabinet is in an appropriate condition to house the traffic signal controller
- h) Check the condition of the traffic signal controller
- i) Clear the fault and error log in the traffic controller after the above work is complete
- j) Check the operation of STREAMS connectivity, and
- k) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate.

Where appropriate, and where it is considered appropriate (i.e. does not justify undertaking under a separate Work Activity), service the equipment in order to rectify the issue identified from the above inspections.

### Applicable Specifications

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS93	<i>Traffic Signals</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS204	<i>Vehicle Detectors</i>
MRTS208	<i>Roadway Ancillary ITS Infrastructure Monitoring and Control</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS211	<i>Pedestrian Push Buttons and Audio Tactile Drivers</i>
MRTS213	<i>UPS for Roadside Devices</i>
MRTS214	<i>Provision of Wireless Traffic Sensors (WTS)</i>
MRTS226	<i>Telecommunications Field Cabinets</i>
MRTS228	<i>Electrical Switchboards</i>
MRTS234	<i>Communications Cables</i>

<b>Reference</b>	<b>Title</b>
MRTS251	<i>Traffic Counter/Classifier</i>
MRTS252	<i>Next Generation Traffic Signal Controllers</i>
MRTS253	<i>Traffic Signal Lanterns</i>
MRTS255	<i>Traffic Signal Controllers</i>
MRTS256	<i>Power Cables</i>
MRTS257	<i>Feeder Cable and Loop Cable for Vehicle Detector</i>
MRTS262	<i>Transportable Variable Message Signs</i>

### **Restoration Standards**

The traffic signal installation, including the controller and controller housing enclosure, should be reinstated to the original operational condition or updated departmental Technical Specifications and standards, if requested by the Principal, and if existing equipment is no longer available from suppliers.

The traffic signal controller housing components should be reinstated to the applicable MRTS226 *Telecommunications Field Cabinets* or updated specifications / standards requested by the Principal.

The Contractor should conduct Activities as specified in TRUM Volume 4.

The Contractor should record details of each site inspection as specified in the Routine Operational Inspection template requirements.

Any repair work undertaken on-site, and any additional works required (i.e. replacement of defective traffic signal lanterns) should be recorded on a maintenance checklist and submitted to the Principal within specified timeframes of the completion of each periodic inspection cycle.

### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
610	Traffic Signal Operational and Controller Inspect & Service	Dollars

### **Testing Requirements**

- a) Refer to Principal provided Programmed Maintenance Schedule for details.
- b) As specified in the Principal supplied Routine Operational Inspection template, and
- c) Consideration should be given to the signal controller where the Work Activity is being undertaken, noting that the department is deploying extra low voltage (ELV) signal controllers which have different periodic testing requirements compared to non-ELV signal controllers.

### **Planning Points to Consider**

N/A.

## 611 Scheduled Replace Smart Lighting Controller (SLC) Only – Route Lighting

### Description

This Work Activity covers the scheduled replacement of the SLC only, where the SLC is the only aspect at fault and where it is located at a roadway, cycleway and pedestrian access lighting installation site, and where directed by the Principal.

### Note:

For this Work Activity, scheduled refers to the routine (periodic scheduled) maintenance required to be undertaken within the prescribed routine maintenance timeframes, including end of life replacement (i.e. planned Activities).

### Work Operations

The Work Operations associated with this Work Activity may include, but are not limited to:

- a) Replace SLC only
- b) Check luminaire, including SLC operation
- c) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- d) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

### Applicable Specifications

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS94	<i>Road Lighting</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS228	<i>Electrical Switchboards</i>



### Restoration Standards

The maximum level of luminaire outages at any one time should not be greater than the Principal's specified percentage of the total luminaires, including SLC installations, for the location.

The lighting installation luminaire should be reinstated to MRTS94 *Road Lighting* or updated specifications / standards requested by the Principal.

Activities specified in TRUM Volume 4 should be performed.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
611	Sch Replace Smart Lighting Controller Only (Route Lighting)	Dollars

### Testing Requirements

- a) Design specifications to satisfy the requirements of AS/NZS 1158 *Lighting for roads and public spaces*, which specifies luminaire servicing availability of at least 95%, and
- b) Road lighting installation wiring should be in accordance with AS/NZS 3000 *Wiring Rules*.

### Planning Points to Consider

N/A.

### 612      **Unscheduled Replace Smart Lighting Controller (SLC) Only – Route Lighting**

#### Description

This Work Activity covers the unscheduled replacement of the SLC only, where the SLC is the only aspect at fault and where it is located at a roadway, cycleway and pedestrian access lighting installation site, and where directed by the Principal.

#### Note:

For this Work Activity, unscheduled refers to ad hoc (non-periodic) maintenance work that was not planned within the prescribed routine maintenance timeframes (i.e. unplanned Activities).

#### Work Operations

The Work Operations associated with this Work Activity may include, but are not limited to:

- a) Replace SLC.
- b) Check luminaire and SLC operation.
- c) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- d) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

### Applicable Specifications

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS94	<i>Road Lighting</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS228	<i>Electrical Switchboards</i>

### Restoration Standards

The maximum level of luminaire outages at any one time should not be greater than the Principal's specified percentage of the total luminaires, including SLC installations, for the location.

The lighting installation luminaire should be reinstated to MRTS94 *Road Lighting* or updated specifications / standards requested by the Principal.

Activities specified in TRUM Volume 4 should be performed.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
612	Unsch Replace Smart Light Controller Only (Route Lighting)	Dollars

### Testing Requirements

- a) Design specifications to satisfy the requirements of AS/NZS 1158 *Lighting for roads and public spaces*, which specifies luminaire servicing availability of at least 95%, and
- b) Road lighting installation wiring should be in accordance with AS/NZS 3000 *Wiring Rules*.

### Planning Points to Consider

N/A.

## 618 Scheduled / Planned Traffic Signal Work

### Description

This Work Activity covers the scheduled / planned maintenance and/or replacement of traffic signal equipment. This may include servicing, repairs, replacement of hardware associated with the traffic signals and traffic performance investigations (excluding signal co-ordination servicing). It does not involve alteration to the traffic signal configuration file and does not include cost recoverable work carried out under the Damages Recovery Work Activity Number 950.

### Note:

For this Work Activity, scheduled refers to the routine (periodic scheduled) maintenance required to be undertaken within the prescribed routine maintenance timeframes. It also includes planned end of life replacement Activities within the prescribed routine maintenance timeframe.

### Work Operations

The Work Operations associated with this Work Activity may include, but are not limited to:

- a) Supply of hardware needed for the normal operation of such infrastructure.
- b) Monitoring and clearing the fault and error logs in traffic controller after the work is complete.
- c) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- d) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

### Applicable Specifications

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS93	<i>Traffic Signals</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS204	<i>Vehicle Detectors</i>
MRTS208	<i>Roadway Ancillary ITS Infrastructure Monitoring and Control</i>

Reference	Title
MRTS210	<i>Provision of Mains Power</i>
MRTS211	<i>Pedestrian Push Buttons and Audio Tactile Drivers</i>
MRTS213	<i>UPS for Roadside Devices</i>
MRTS214	<i>Provision of Wireless Traffic Sensors (WTS)</i>
MRTS226	<i>Telecommunications Field Cabinets</i>
MRTS228	<i>Electrical Switchboards</i>
MRTS234	<i>Communications Cables</i>
MRTS251	<i>Traffic Counter/Classifier</i>
MRTS252	<i>Next Generation Traffic Signal Controllers</i>
MRTS253	<i>Traffic Signal Lanterns</i>
MRTS255	<i>Traffic Signal Controllers</i>
MRTS256	<i>Power Cables</i>
MRTS257	<i>Feeder Cable and Loop Cable for Vehicle Detector</i>
MRTS262	<i>Transportable Variable Message Signs</i>

### Restoration Standards

The traffic signal installation should be reinstated to the original operational condition or updated specification and standards, if requested by the Principal.

UPS Battery Replacement should be in accordance with MRTS213 *UPS for Roadside Devices*.

The vehicle detector installation should be reinstated to MRTS251 *Traffic Counter/Classifier* or updated specifications and standards requested by the Principal.

The electrical installation should be reinstated to the applicable MRTS and Standard Drawing(s) for the installation, or updated specifications and standards, if requested by the Principal.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
618	Scheduled / Planned Traffic Signal Work	Dollars

### Testing Requirements

- a) Traffic signal installation testing should be undertaken in accordance with Compliance Testing of MRTS93 *Traffic Signals* and AS/NZS 3000 *Wiring Rules*.
- b) UPS batteries should be tested to demonstrate run times in accordance with MRTS213 *UPS for Roadside Devices* and the original design criteria.
- c) Vehicle detector installation should be tested in accordance with the applicable clauses of MRTS201 *General Equipment Requirements*.
- d) Electrical Test Certificate should be supplied, where required, and
- e) Consideration should be given to the signal controller where the Work Activity is being undertaken, noting that the department is deploying extra low voltage (ELV) signal controllers which have different periodic testing requirements compared to non-ELV signal controllers.

## Planning Points to Consider

N/A.

### 619      **Unscheduled / Unplanned Traffic Signal Work**

#### Description

This Work Activity covers the unscheduled / unplanned maintenance of traffic signal equipment defects and faults (except for priority group 1 faults, as defined in the Intervention Levels and response times (IL/RT) criteria (see Chapter 4 of these Routine Maintenance Guidelines)). This may include servicing, repairs, improvements, traffic signal loop / detector replacement / recut / installations, and work associated with traffic performance investigations (excluding signal co-ordination servicing). This Work Activity does not involve:

- a) alteration to the traffic signal configuration file
- b) cost recoverable work carried out under the Damages Recovery Work Activity Number 950, and
- c) end-of-life replacement.

#### Note:

For this Work Activity, unscheduled refers to ad hoc (non-periodic) maintenance work that was not planned within the prescribed routine maintenance timeframes (i.e. unplanned Activities).

#### Work Operations

The Work Operations associated with this Work Activity may include, but are not limited to:

- a) Supply, replacement / recut / installations and repair of hardware needed for the normal operation of such infrastructure.
- b) Monitoring and clearing the fault and error logs in the traffic controller after the work is complete.
- c) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- d) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

#### Applicable Specifications

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>

<b>Reference</b>	<b>Title</b>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS93	<i>Traffic Signals</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS204	<i>Vehicle Detectors</i>
MRTS208	<i>Roadway Ancillary ITS Infrastructure Monitoring and Control</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS211	<i>Pedestrian Push Buttons and Audio Tactile Drivers</i>
MRTS213	<i>UPS for Roadside Devices</i>
MRTS214	<i>Provision of Wireless Traffic Sensors (WTS)</i>
MRTS226	<i>Telecommunications Field Cabinets</i>
MRTS228	<i>Electrical Switchboards</i>
MRTS234	<i>Communications Cables</i>
MRTS251	<i>Traffic Counter/Classifier</i>
MRTS252	<i>Next Generation Traffic Signal Controllers</i>
MRTS253	<i>Traffic Signal Lanterns</i>
MRTS255	<i>Traffic Signal Controllers</i>
MRTS256	<i>Power Cables</i>
MRTS257	<i>Feeder Cable and Loop Cable for Vehicle Detector</i>
MRTS262	<i>Transportable Variable Message Signs</i>

### **Restoration Standards**

The traffic signal installation should be reinstated to the original operational condition or updated specifications and standards, if requested by the Principal.

UPS battery replacement should be in accordance with MRTS213 *UPS for Roadside Devices*.

The vehicle detector installation should be reinstated to MRTS251 *Traffic Counter/Classifier*, or updated specifications and standards requested by the Principal.

The electrical installation should be reinstated to the applicable MRTS and Standard Drawing(s) for the installation, or updated specifications and standards, if requested by the Principal.

### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
619	Unscheduled / Unplanned Traffic Signal Work	Dollars

### Testing Requirements

- a) Traffic signal installation testing should be undertaken in accordance with Compliance Testing of MRTS93 *Traffic Signals* and AS/NZS 3000 *Wiring Rules*.
- b) UPS batteries should be tested to demonstrate run times in accordance with MRTS213 *UPS for Roadside Devices* and the original design criteria.
- c) The vehicle detector installation should be tested in accordance with the applicable clauses of MRTS201 *General Equipment Requirements*.
- d) Electrical Test Certificate should be supplied, where required, and
- e) Consideration should be given to the signal controller where the Work Activity is being undertaken, noting that the department is deploying extra low voltage (ELV) signal controllers, which have different periodic testing requirements compared to non-ELV signal controllers.

### Planning Points to Consider

N/A.

### 620 Repair Inductive Loops – Minor Damage

#### Description

The disconnection and rejoining of faulty connection of loop wire to detector feed cable.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
620	Repair Inductive Loops – Minor Damage	Each (Joint)

No other details are included in the Maintenance Activity Standard for this Activity.

### 621 Inductive Loops (Recut Loops)

#### Description

The cutting of a new detector loop, including:

- disconnection of existing loop wire from detector feed cable
- cutting of new loop slot
- placing of new loop wire
- filling of slot after cleaning, and
- jointing of new loop wire to existing detector feed cable.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
621	Inductive Loops (Recut Loops)	Each (Joint)

No other details are included in the Maintenance Activity Standard for this Activity.

**622 Install New Traffic Signal Configuration File****Description**

This Work Activity covers the removal of an existing, installation of a new traffic signal configuration file, and viewing of at least one complete phase sequence of traffic signals to verify its correct operation.

**Work Operations**

The Work Operations associated with this Work Activity may include, but are not limited to:

- a) Remove old traffic signal configuration file.
- b) Arrange for new traffic signal configuration file.
- c) Supply and install new traffic signal configuration file.
- d) Diagnose and repair of any controller faults.
- e) Remove from site and arrange for the correct disposal of damaged / malfunctioning equipment.
- f) The undertaking of traffic control, where required.
- g) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- h) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

**Applicable Specifications**

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but are not limited to, the following:

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS93	<i>Traffic Signals</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>



Reference	Title
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS204	<i>Vehicle Detectors</i>
MRTS208	<i>Roadway Ancillary ITS Infrastructure Monitoring and Control</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS211	<i>Pedestrian Push Buttons and Audio Tactile Drivers</i>
MRTS213	<i>UPS for Roadside Devices</i>
MRTS214	<i>Provision of Wireless Traffic Sensors (WTS)</i>
MRTS228	<i>Electrical Switchboards</i>
MRTS234	<i>Communications Cables</i>
MRTS251	<i>Traffic Counter/Classifier</i>
MRTS252	<i>Next Generation Traffic Signal Controllers</i>
MRTS253	<i>Traffic Signal Lanterns</i>
MRTS255	<i>Traffic Signal Controllers</i>
MRTS256	<i>Power Cables</i>
MRTS257	<i>Feeder Cable and Loop Cable for Vehicle Detector</i>
MRTS262	<i>Transportable Variable Message Signs</i>

### Restoration Standards

The traffic signal controller installation should be reinstated to the original operational condition or updated specifications and standards, if requested by the Principal.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
622	Install New Traffic Signal Configuration File	Dollars

### Testing Requirements

- a) Traffic signal installation testing should be undertaken in accordance with Compliance Testing of MRTS93 *Traffic Signals* Clause 16 and AS/NZS 3000 *Wiring Rules*, and
- b) Consideration should be given to the signal controller where the Work Activity is being undertaken, noting that the department is deploying extra low voltage (ELV) signal controllers, which have different periodic testing requirements compared to non-ELV signal controllers.

### Planning Points to Consider

N/A.

### 623 Replace Pedestrian Crossing Push Buttons

#### Description

The replacement of standard type pedestrian push buttons with audio tactile type, including driver unit.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
623	Replace Pedestrian Crossing Push Buttons	Each (Set) / Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**624 Traffic Signal Co-ordination Servicing**

Details to be advised.

**625 Road Safety Camera Works – General**

Details to be advised.

**627 Closed Circuit Television (CCTV) Maintenance**

Details to be advised.

**628 Variable Messaging Signs (VMS) Maintenance**

Details to be advised.

**629 Routine Traffic Management Equipment Servicing****Description**

All works carried out for Preventative Maintenance to designated items of traffic management equipment according to a maintenance interval program.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
629	Routine Traffic Management Equipment Servicing	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**630 Accident Damage – Traffic Signals****Description**

The straightening of a bent post and/or bent foundation bolts caused by an accident.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
630	Accident Damage – Traffic Signals	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**631 Accident / Storm Damage – Re-Aim Traffic Signal Lanterns****Description**

The re-aiming of traffic signal lanterns misaligned as a result of an accident or storm.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
631	Accident / Storm Damage – Re-Aim Traffic Signal Lanterns	Each (Lantern) / Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**632 Accident Damage – Replace Traffic Signal Lanterns, Posts and Foundations****Description**

The replacement of any damaged traffic signal lanterns, posts and foundations caused by an accident that are unable to be satisfactorily repaired.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
632	Accident Damage – Replace Traffic Signal Lanterns, Posts and Foundations	Each (Pole) / Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**633 Accident Damage – Replace Traffic Signal Post and Foundations and Reinstate Lanterns from Old Pole****Description**

The removal of traffic signal lanterns not damaged, replacement of accident damaged post and foundation unable to be reinstated and reinstatement of existing lanterns.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
633	Accident Damage – Replace Traffic Signal Post and Foundations and Reinstall Lanterns from Old Pole	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**634 Reinstall Damaged Route Lighting Poles and Lighting****Description**

All works associated with the reinstatement of damaged light and power pole supports and associated fittings.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
634	Reinstall Damaged Route Lighting Poles and Lighting	Each (Pole) / Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**635 Repair Minor Damage to Electrical Pits****Description**

All works associated with the repair of minor damage to electrical pits associated with lighting or power asset facilities.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
635	Repair Minor Damage to Electrical Pits	Each (Pit)

No other details are included in the Maintenance Activity Standard for this Activity.

**637 Replace Damaged Electrical Pit Covers****Description**

The replacement of damaged electrical pit covers with new covers, including the proper disposal of the damaged cover.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
637	Replace Damaged Electrical Pit Covers	Each (Lid)

No other details are included in the Maintenance Activity Standard for this Activity.

**638 Replace Damaged Electrical Pit Lids – Route Lightning**

Details to be advised.

**639 Replace / Repair Damaged Electrical Pit Lids – Route Lightning**

Details to be advised.

**640 Repair Damaged Electrical Pits****Description**

The removal, disposal and replacement of damaged electrical pits, including cover(s), where necessary.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
640	Repair Damaged Electrical Pits	Each (Pit)

No other details are included in the Maintenance Activity Standard for this Activity.

**641 Repaint Traffic Signal Controller****Description**

The cleaning down, including removal of posters and repainting of traffic signal controller cabinet.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
641	Repaint Traffic Signal Controller	Each

No other details are included in the Maintenance Activity Standard for this Activity.

**642 Repaint Traffic Signal Mast Arms (including Hardware)****Description**

The cleaning down, including removal of posters and repainting of traffic signal mast arms and associated hardware.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
642	Repaint Traffic Signal Mast Arms (including Hardware)	Each (Mast arm)

No other details are included in the Maintenance Activity Standard for this Activity.

**643 Repaint Traffic Signal Poles (including Hardware)****Description**

The cleaning down, including removal of posters and repainting of traffic signal posts and associated hardware.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
643	Repaint Traffic Signal Poles (including Hardware)	Each (Pole)

No other details are included in the Maintenance Activity Standard for this Activity.

**644 Repaint Route Lighting Poles (including Hardware)**

Details to be advised.

**650 Emergency 'Make Safe' Callout – Traffic Signals****Description**

This Work Activity covers the provision of emergency 'make safe' callout attendance, as required by the Principal, to attend and inspect a traffic signal site in response to a reported emergency and to

make the traffic signal site safe and operational, but not necessarily including undertaking the required remedial action in full.

**Note:**

For this Work Activity, emergency 'make safe' callout refers to urgent (unexpected / non-programmed) work necessary to make an installation safe. These are typically a higher priority than programmed Activities and may interrupt programmed Activities.

**Work Operations**

The Work Operations associated with this Work Activity may include, but are not limited to:

- a) If required, carry out all works required to make the site safe in the case of an emergency callout. If there are no safety concerns, no further immediate action is required.
- b) Report the incident to appropriate departmental personnel / systems, as designated by the Principal.
- c) If required, carry out any follow up repairs and maintenance in accordance with requirements set out by the Principal.
- d) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- e) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

**Applicable Specifications**

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS93	<i>Traffic Signals</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS204	<i>Vehicle Detectors</i>
MRTS208	<i>Roadway Ancillary ITS Infrastructure Monitoring and Control</i>
MRTS210	<i>Provision of Mains Power</i>

Reference	Title
MRTS211	<i>Pedestrian Push Buttons and Audio Tactile Drivers</i>
MRTS213	<i>UPS for Roadside Devices</i>
MRTS214	<i>Provision of Wireless Traffic Sensors (WTS)</i>
MRTS226	<i>Telecommunications Field Cabinets</i>
MRTS228	<i>Electrical Switchboards</i>
MRTS234	<i>Communications Cables</i>
MRTS251	<i>Traffic Counter/Classifier</i>
MRTS252	<i>Next Generation Traffic Signal Controllers</i>
MRTS253	<i>Traffic Signal Lanterns</i>
MRTS255	<i>Traffic Signal Controllers</i>
MRTS256	<i>Power Cables</i>
MRTS257	<i>Feeder Cable and Loop Cable for Vehicle Detector</i>
MRTS262	<i>Transportable Variable Message Signs</i>

### Restoration Standards

The traffic signal installation defects should be reinstated to the original operational and design and/or 'make safe' conditions within the set response and rectification times, as directed by the Principal and TRUM Volume 4.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
650	Emergency 'Make Safe' Callout – Traffic Signals	Dollars

### Testing Requirements

- a) Traffic signal installation wiring should be in accordance with AS/NZS 3000 *Wiring Rules*.
- b) Electrical Test Certificate should be supplied, as required, and
- c) Consideration should be given to the signal controller where the Work Activity is being undertaken, noting that the department is deploying extra low voltage (ELV) signal controllers, which have different periodic testing requirements compared to non-ELV signal controllers.

### Planning Points to Consider

N/A.

### 651 Emergency 'Make Safe' Callout – Lighting

#### Description

This Work Activity covers the provision of emergency 'make safe' callout attendance, as required by the Principal, to attend and inspect lighting installations in response to a reported emergency and to make the lighting installation safe and operational but not necessarily including undertaking the required remedial action in full.



**Note:**

For this Work Activity, emergency 'make safe' callout refers to urgent (unexpected / non-programmed) work necessary to make an installation safe. These are typically a higher priority than programmed Activities and may interrupt programmed Activities.

**Work Operations**

The Work Operations associated with this Work Activity may include, but are not limited to:

- a) If required, carry out all works required to make the site safe in the case of an emergency callout. If there are no safety concerns, no further immediate action is required.
- b) Report the incident to the department, as designated by the Principal.
- c) If required, carry out any follow up repairs and maintenance in accordance with requirements set out by the Principal.
- d) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- e) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

**Applicable Specifications**

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS94	<i>Road Lighting</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS228	<i>Electrical Switchboards</i>
MRTS262	<i>Transportable Variable Message Signs</i>

### Restoration Standards

The lighting installation defects should be reinstated to the original operational and design and/or 'make safe' conditions within the set response and rectification times, as directed by the Principal and TRUM Volume 4.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
651	Emergency 'Make Safe' Callout – Lighting	Dollars

### Testing Requirements

- a) The lighting installation wiring should be in accordance with AS/NZS 3000 *Wiring Rules*, and
- b) Electrical Test Certificate should be supplied, as required.

### Planning Points to Consider

N/A.

### 660 Electrical Safety Inspections – Traffic Signals

#### Description

The electrical safety inspections carried out on traffic signals.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
660	Electrical Safety Inspections – Traffic Signals	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### 661 Electrical Safety Inspections – ITS Devices Signals

#### Description

The electrical safety inspections carried out on ITS devices.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
661	Electrical Safety Inspections – ITS Devices Signals	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**662 Electrical Safety Inspections – Route Lighting****Description**

The electrical safety inspections carried out on route lighting.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
662	Electrical Safety Inspections – Route Lighting	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**700 TRAFFIC DELINEATION****701 Repaint Road Centre Lines – Minor**

Details to be advised.

**702 Repaint Road Centre Lines – Major**

Details to be advised.

**703 Repaint Double Barrier Lines – Daywork**

Details to be advised.

**704 Paint New Yellow Line**

Details to be advised.

**705 Repaint Yellow Line**

Details to be advised.

**706 Spotting for Yellow Lines**

Details to be advised.

**707 Repaint Unbroken Road Centre Lines (150 mm Width)**

Details to be advised.

**709 Repaint Double Barrier Line – General**

Details to be advised.

**710 Repaint Road Edge Lines – Minor**

Details to be advised.

**711 Repaint Road Edge Lines – Major**

Details to be advised.

**712 Repaint Edge Line (100 mm Width)**

Details to be advised.

**713 Repaint Edge Line (150 mm Width)**

Details to be advised.

**714 Repaint Unbroken Lane Line – General**

Details to be advised.

**719 Repaint Single Barrier Line – General**

Details to be advised.

**720 Repaint Single Broken Lines**

Details to be advised.

**721 Repaint Barrier Broken Lines**

Details to be advised.

**722 Repaint Broken Lane Line – General**

Details to be advised.

**723 Repaint Continuity Line – General**

Details to be advised.

**724 Repaint Broken Line – General**

Details to be advised.

**725 Repaint 150 mm Outline – General****Description**

All work associated with the renovation of road line marking, including sweeping, spotting, symbolising and repainting.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

**Restoration Standards**

The road marking shall be reinstated to the standard for the original marking and in accordance with the Applicable Specifications and MUTCD.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
701	Repaint Road Centre Lines – Minor	Line (km)
702	Repaint Road Centre Lines – Major	Line (km)

Item	Description	Units of Measurement
703	Repaint Double Barrier Lines – Daywork	Line (km)
709	Repaint Double Barrier Line – General	Line (km)
710	Repaint Road Edge Lines – Minor	Line (km)
711	Repaint Road Edge Lines – Major	Line (km)
712	Repaint Edge Line – 100 mm Width	Line (km)
713	Repaint Edge Line – 150 mm Width	Line (km)
714	Repaint Unbroken Lane Line – General	Line (km)
719	Repaint Single Barrier Line – General	Line (km)
720	Repaint Single Broken Lines	Line (km)
721	Repaint Barrier Broken Lines	Line (km)
722	Repaint Broken Lane Line – General	Line (km)
723	Repaint Continuity Line – General	Line (km)
724	Repaint Broken Line – General	Line (km)
725	Repaint 150 mm Outline – General	Line (km)

### Testing Requirements

Minimum Test Frequency	
Line Width	1 / Lot
Line Thickness	1 / Lot

### WORK PREPARATION

#### Plant Requirements

Job truck

Line marking machine

Line marking applicators, as appropriate

Spray gun

Thermoplastic machine

#### Materials

Paint

Thinners

Kerosene / mineral spirits

Detergent

Water

Glass beads

Extra traffic cones

### **Manpower Requirements**

Leading hand	1
Skilled applicator	1
Labourers	1 - 2
Operators	As required
Traffic controllers	As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Specify the type of line marking and the plant and materials required for it and organise these (consider traffic volume, cost, life, condition of existing surface and time available to do the work).
2. Specify how to clean existing surface, if required.
3. Consider changes to existing marking (requires RPEQ approval), and
4. Consider delaying this Activity if maintenance or construction is scheduled for the area within the next three months.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Clean the pavement in the work area, as required:
  - a. sweep the pavement, and
  - b. use kerosene or mineral spirits on oil stains, then wash with mild detergent.
4. Spot where line have been obliterated.
5. Apply marking material, including beads.
6. Check the work against the Restoration Standards.
7. Check markings are dry.

8. Leave work site safe and tidy:
  - a. remove all loose material, and
9. Remove traffic control:
  - a. clean / repair, as necessary.

### 729 Urban Line Marking – Minor

#### Description

All works associated with minor marking of lines and markings in an urban built up environment.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
729	Urban Line Marking – Minor	m <sup>2</sup>

No other details are included in the Maintenance Activity Standard for this Activity.

### 730 Repaint Lateral Markings

#### Description

All work associated with the renovation of lateral road line marking, including sweeping, spotting, symbolising and repainting.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
730	Repaint Lateral Markings	m <sup>2</sup>

No other details are included in the Maintenance Activity Standard for this Activity.

### 731 Repaint Road Markings

#### Description

The renovation or replacement of road marking, including transverse lines, chevrons, arrows, legends and painted medians.

**Applicable Specification**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS45	<i>Road Surface Delineation</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

**Restoration Standards**

The road marking shall be reinstated to the standard for the original marking and in accordance with the Applicable Specifications and MUTCD.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
731	Repaint Road Markings	m <sup>2</sup>

**Testing Requirements**

Minimum Test Frequency	
Line Width	1 / Lot
Line Thickness	1 / Lot

Note: Lot definition being one Work Order

**WORK PREPARATION****Plant Requirements**

Job truck

Line marking applicators, as appropriate

Spray gun

Pedestrian line marking machine

Thermoplastic machine

**Materials**

Paint

Thinners

Kerosene / mineral spirits

Detergent

Water

Thermoplastics

Glass beads

Extra traffic cones



### **Manpower Requirements**

Leading hand	1
Skilled applicator	1
Labourers	1 - 2
Traffic controllers	As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Specify the type of marking and the plant and materials required for it and organise these (consider traffic volume, cost, life, condition of existing surface and time available to do the work).
2. Specify how to clean existing surface.
3. Consider changes to existing marking (requires RPEQ approval), and
4. Consider delaying this Activity if maintenance or construction is scheduled for the area within the next three months.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Clean the pavement in the work area:
  - a. sweep the pavement with hard broom, and
  - b. use kerosene or mineral spirits on oil stains, then wash with mild detergent.
4. Check dimensions of existing markings or set out new markings:
  - a. use templates, if applicable.
5. Apply marking material, including beads.
6. Check the work against the Restoration Standards.
7. Check markings are dry.

8. Leave work site safe and tidy:
  - a. remove all loose material, and
9. Remove traffic control:
  - a. clean / repair, as necessary.

### 735 Thermoplastic Line Marking

#### Description

All works associated with the use of thermoplastic material to mark new lines or markings or re-treat deteriorated existing lines or markings.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

#### Restoration Standards

The road marking shall be reinstated to the standard for the original lines or marking and/or in accordance with the Applicable Specifications and MUTCD.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
735	Thermoplastic Line Marking	m <sup>2</sup>

#### Testing Requirements

Minimum Test Frequency	
Line Width	1 / Lot
Line Thickness	1 / Lot

Note: Lot definition being one Work Order.

#### WORK PREPARATION

##### Plant Requirements

Job truck

Thermoplastic machine

### **Materials**

Kerosene / mineral spirits

Detergent

Water

Thermoplastics

Glass beads

Extra traffic cones

### **Manpower Requirements**

Leading hand                    1

Skilled applicator            1

Labourers                        1 - 2

Operators                        As required

Traffic controllers            As required

### **Average Daily Production**

Not detailed.

### **Particular Planning Points to Consider**

1. Specify the location of line marking and the plant and materials required for it and organise these.
2. Specify how to clean existing surface, if required.
3. Consider changes to existing marking (requires RPEQ approval), and
4. Consider delaying this Activity if maintenance or permanent work is scheduled for the area within the next three months.

### **WORK PROCEDURES**

#### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Clean the pavement in the work area, as required:
  - a. sweep the pavement, and
  - b. use kerosene or mineral spirits on oil stains, then wash with mild detergent.

4. Spot for new lines or where line have been obliterated.
5. Apply marking material, including beads.
6. Check the work against the Restoration Standards.
7. Leave work site safe and tidy:
  - a. remove all loose material, and
8. Remove traffic control:
  - a. clean / repair, as necessary.

### **736 Audio Tactile Line Marking (ATLM)**

#### **Description**

All works associated with the use of audio tactile materials to mark new lines or markings or retreat existing lines or markings.

#### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>

#### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
736	Audio Tactile Line Marking (ATLM)	Line (km)

No other details are included in the Maintenance Activity Standard for this Activity.

### **740 Raised Pavement Markers**

#### **Description**

The installation of new or replacement of missing raised pavement markers, including the supply of markers.

#### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS45	<i>Road Surface Delineation</i>
-	<i>Queensland Manual of Uniform Traffic Control Devices</i>

#### **Restoration Standards**

The raised pavement markers shall be installed replaced to the requirements of MRTS14 *Road Furniture* and the MUTCD.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
740	Raised Pavement Markers	Each (Marker)

**Testing Requirements**

None listed.

**WORK PREPARATION****Plant Requirements**

Job truck

**Materials**

Pavement markers

Epoxy adhesive

Kerosene / mineral spirits

Detergent

Water

**Manpower Requirements**

Leading hand 1

Skilled applicator 1

Labourers 1 - 2

Traffic controllers As required

**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. Specify the type of marker and the plant and materials required for it and organise these (consider traffic volume, cost, life, condition of existing surface and time available to do the work).
2. Specify how to clean existing surface.
3. Consider changes to existing marking (requires RPEQ approval), and
4. Consider delaying this Activity if maintenance or construction is scheduled for the area within the next three months.

**WORK PROCEDURES****Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices

- c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Clean the pavement in the work area:
  - a. sweep the pavement with hard broom, and
  - b. use kerosene or mineral spirits on oil stains, then wash with mild detergent.
4. Set out new markings.
5. Apply markers:
  - a. adhesive provides a flat surface and fully supports marker, and
  - b. press marker so adhesive squeezes out all round.
6. Check the work against the Restoration Standards.
7. Leave work site safe and tidy:
  - a. remove all loose material, and
8. Remove traffic control:
  - a. clean / repair, as necessary.

#### **745 Remove Longlines and then Child Numbers for Water Blasting, Grinding**

##### **Description**

All work associated with the removal of unwanted road lines.

##### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>

The road line shall be removed to the requirements set out in the Work Order.

##### **Restoration Standards**

The road line shall be ground off or otherwise treated so that the treated area will not be mistaken for a line.

##### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
745	Remove Longlines and then Child Numbers for Water Blasting, Grinding	m <sup>2</sup>

##### **Testing Requirements**

None listed.

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Grinding machine

### **Materials**

None detailed

### **Manpower Requirements**

Leading hand                    1

Operator                         1

Labourers                        1 - 2

Traffic controllers            As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Specify the type and location of line to be removed and the plant and materials required for it and organise these.
2. Consider the width of treatment required to avoid the treatment area being mistaken for a line, and
3. Consider delaying this Activity if maintenance or permanent work is scheduled for the area within the next three months.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Determine width of surface to be ground:
  - a. from supervisor's instructions.
4. Grind the surface to remove the line.
5. Remove any loose material from the road surface.
6. Check the work against the Restoration Standards.

7. Leave work site safe and tidy:
  - a. remove all loose material, and
8. Remove traffic control:
  - a. clean / repair, as necessary.

### **750 Remove Lateral Markings and then Child Numbers for Water Blasting, Grinding**

#### **Description**

All works associated with the removal of unwanted road markings.

#### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>

The marking shall be removed to the requirements set out in the Work Order.

#### **Restoration Standards**

The marking shall be ground off or otherwise treated so that the treated area will not be mistaken for a marking.

#### **Activity Items and Units of Measurement**

<b>Item</b>	<b>Description</b>	<b>Units of Measurement</b>
750	Remove Lateral Markings and then Child Numbers for Water Blasting, Grinding	m <sup>2</sup>

#### **Testing Requirements**

None listed.

#### **WORK PREPARATION**

##### **Plant Requirements**

Job truck

Grinding machine

##### **Materials**

None detailed

##### **Manpower Requirements**

Leading hand	1
Operator	1
Labourers	1 - 2
Traffic controllers	As required



**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. Specify the type and location of marking to be removed and the plant and materials required for it and organise these.
2. Consider the width of treatment required to avoid the treated area being mistaken for a marking, and
3. Consider delaying this Activity if maintenance or permanent work is scheduled for the area within the next three months.

**WORK PROCEDURES****Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Determine width of surface to be treated:
  - a. from supervisor's instructions.
4. Grind the surface or otherwise treat to remove the marking.
5. Remove any loose material from the road surface.
6. Check the work against the Restoration Standards.
7. Leave work site safe and tidy:
  - a. remove all loose material, and
8. Remove traffic control:
  - a. clean / repair, as necessary.

**759 Line Marking – General****Description**

Any line marking works not covered by Activity Numbers 701, 702, 703, 709, 710, 711, 712, 713, 714, 719, 720, 721, 722, 723, 724, 725, 729, 730, 731, 735, 736, 740, 745 and 750.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

Reference	Title
MRTS45	<i>Road Surface Delineation</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
759	Line Marking – General	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**760 Coloured Surface Treatments and then Child Numbers for Town Entry Treatments, Bikeways, School Zones, Wildlife, Busway Entry**

Details to be advised.

**770 Retro Reflectivity Testing**

Details to be advised.

**780 Skid Resistance Testing**

Details to be advised.

**800 STRUCTURES**

**809 Routine Bridge Servicing (RAMC only)**

Details to be advised.

**815 Replace / Repair Expansion Joints (Concrete)**

**Description**

All works associated with the repair or replacement of missing or damaged bridge expansion joints of concrete deck bridge types to provide an adequate seal to protect the bridge components from the ingress of moisture and foreign material.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
815	Replace / Repair Expansion Joints (Concrete)	Metres

No other details are included in the Maintenance Activity Standard for this Activity.

**819 Bridgework, Other Structural (Concrete)**

**Description**

All other structural works carried out to concrete components of bridges not covered by Activity Numbers 801, 815 and 851.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
819	Bridgework, Other Structural (Concrete)	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**820 Clean / Repaint Steel Elements****Description**

The preparation by appropriate cleaning and repainting of steel elements of bridge structures.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
820	Clean / Repaint Steel Elements	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**822 Repair Minor Damage to Steel Elements****Description**

All works associated with the repair of minor damage to steel elements of bridge structures.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
822	Repair Minor Damage to Steel Elements	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**823 Replace / Repair Expansion Joints (Steel)****Description**

All works associated with the repair or replacement of missing or damaged expansion joints of bridges of predominately steel construction to provide an adequate seal to protect the bridge components from the ingress of moisture and foreign materials.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
823	Replace / Repair Expansion Joints (Steel)	Metres

No other details are included in the Maintenance Activity Standard for this Activity.

**829 Bridgework, Other Structural (Steel)****Description**

Any other structural work carried out to steel elements of bridge structures not covered by Activity Numbers 822 and 823.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
829	Bridgework, Other Structural (Steel)	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**833 Reinstate Timber Piles****Description**

All works associated with the removal and replacement or splicing of deteriorated unserviceable timber piles of bridge structures.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
833	Reinstate Timber Piles	Metres (Length) / Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**834 Repair / Replace Timber Corbels****Description**

The removal and replacement or repair of any timber bridge corbel determined to be in an unserviceable structural condition.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
834	Repair / Replace Timber Corbels	Each (Corbel)

No other details are included in the Maintenance Activity Standard for this Activity.

**835 Repair / Replace Timber Headstocks**

Details to be advised.

**836 Replace Timber Girders****Description**

The removal and replacement of any timber bridge girder in an unserviceable structural condition.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
836	Replace Timber Girders	Each (Girder)

No other details are included in the Maintenance Activity Standard for this Activity.

**837 Replace Deck Planks with New Planks****Description**

The removal and replacement of any timber bridge deck plank in an unserviceable structural condition.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
837	Replace Deck Planks with New Planks	m <sup>2</sup>

No other details are included in the Maintenance Activity Standard for this Activity.

**838 Repair / Replace Kerbs****Description**

The removal and replacement or repair of any timber or concrete bridge kerb determined to be in a dangerous or unserviceable structural condition.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
838	Repair / Replace Kerbs	Metres

No other details are included in the Maintenance Activity Standard for this Activity.

**849 Bridgework, Other Structural (Timber)****Description**

All other structural works carried out to timber components of bridges not covered by Activity Numbers 803, 833, 834, 835, 836, 837, 838 and 852.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
849	Bridgework, Other Structural (Timber)	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**850 Replace / Repair Relieving Slabs****Description**

All works associated with the repair or replacement of cracked and unserviceable relieving slabs to bridge structures.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
850	Replace / Repair Relieving Slabs	Dollars / m <sup>3</sup>

No other details are included in the Maintenance Activity Standard for this Activity.

**851 Repair Spalled and Cracked Structural Concrete Elements (Concrete Bridges)****Description**

All works associated with the refurbishment of spalled and cracked concrete sections on bridges of predominantly concrete construction.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
851	Repair Spalled and Cracked Structural Concrete Elements (Concrete Bridges)	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**852 Repair Spalled and Cracked Structural Concrete Elements (Timber Bridges)****Description**

All works associated with the refurbishment of spalled and cracked concrete elements on bridges of predominately timber construction, including concrete kerbs and rail supports.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
852	Repair Spalled and Cracked Structural Concrete Elements (Timber Bridges)	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**853 Repair Spalled and Cracked Structural Concrete Elements (Steel Bridges)****Description**

All works associated with the refurbishment of spalled and cracked concrete elements on bridges of predominantly steel construction, including concrete kerbs and rail supports.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
853	Repair Spalled and Cracked Structural Concrete Elements (Steel Bridges)	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**855 Repair / Replace Batter Protection****Description**

All works associated with the reinstatement replacement of deteriorated or damaged bridge batter protection works of bridge structures

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
855	Repair / Replace Batter Protection	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**859 Bridgework – General****Description**

All general works of a non-routine nature carried out to timber, steel and concrete bridge components not covered by Activity Number 809.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>



**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
859	Bridgework – General	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**860 Routine Grid Servicing****Description**

All work of a routine nature necessary to maintain a sound and effective grid, including de-silting of the opening and upkeep of grid hazard signs.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
860	Routine Grid Servicing	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**861 Repair or Replace Grids****Description**

All works associated with the repair of defective grids, including structural repair to rails and bearers and may involve complete structural replacement.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>

**Restoration Standards**

The grid shall be repaired to the standards specified in the approved repair method or replaced as shown in the standard drawings and specified in MRTS14 *Road Furniture*.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
861	Repair or Replace Grids	Dollars

**Supplementary Work Items and Units of Measurement**

Item	Description	Units of Measurement
	Grid – Repair	Lump Sum
912100	Provision for traffic	Lump Sum

Item	Description	Units of Measurement
963100	Grid – Removal of the existing structure	Each
963200	Grid – Excavation work	m <sup>3</sup>
963300	Grid – Construction	Each

## WORK PREPARATION

### Plant Requirements

Job truck

Bobcat / backhoe / loader

### Materials

Grid components as per the standard drawings

Concrete as per the Standard Drawings and MRTS70 *Concrete*

### Manpower Requirements

Leading hand 1

Labourers 2

Operator 1

Traffic controllers 2

### Average Daily Production

Not listed.

### Particular Planning Points to Consider

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the grids requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## WORK PROCEDURES

### Sequential Steps and Check Points

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights traffic control devices
  - b. safety clothing, and
  - c. vehicle position.
2. Determine grids to be repaired:
  - a. from supervisor's instructions.
3. Repair grid:
  - a. in accordance with details in Work Order.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material, and
  - b. no material to block drains.
6. Remove traffic control:
  - a. clean / repair, as necessary.

### 862 Widen / Replace Narrow Grids

#### Description

The widening or replacement of grid structures due to inadequacy or poor structural condition, including removal and disposal of old grid and construction of new grid, including fencing requirements, where appropriate.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
862	Widen / Replace Narrow Grids	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### 863 Clean / Maintain Drainage Components

Details to be advised.

### 864 Tighten Existing Bolts – Steel and Concrete Structures

Details to be advised.

**865 Rail Crossing Servicing****Description**

All works of a routine nature necessary to maintain a sound crossing, including pavement repairs where the defect has resulted from the presence of the rails.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
865	Rail Crossing Servicing	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**870 Repair Noise Barriers****Description**

All work associated with the repair of roadside noise barrier fencing.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>

The work shall include:

1. removal of barrier fencing components
2. supply of new barrier fencing components
3. straightening of existing posts
4. installation of new posts
5. erection of new panels, and
6. transport of old components to the nearest maintenance depot.

**Restoration Standards**

The fencing shall be repaired to the requirements set out in the Work Order.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
870	Repair Noise Barriers	Dollars

**Testing Requirements**

Nil

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Excavating / post driving equipment

### **Materials**

Panels and posts

Miscellaneous (bolts, paint etc)

### **Manpower Requirements**

Leading hand                    1

Labourers                        1 - 3

Operator                         As required

Traffic controllers            As required

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. Define the fencing for repair.
2. What has caused the defect? Schedule another Activity to correct this, if needed.
3. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Specify or mark out the length of fencing requiring repair, and
7. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.

3. Repair barrier fencing:
  - a. straighten posts, and
  - b. replace damaged components.
4. Check if painting is required:
  - a. if required, advise supervisor.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### 875 Repair Restraining Structures – Gabions, Reinforced Walls

#### Description

All work associated with the repair of restraining structures, such as gabions and reinforced walls.

#### Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Embankment Slope Protections</i>
MRTS70	<i>Concrete</i>

#### Restoration Standards

The restraining structures shall be repaired to the standards specified for new work in MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections* and MRTS70 *Concrete*. All excess material shall be disposed of outside the road reservation.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
875	Repair Restraining Structures – Gabions, Reinforced Walls	m <sup>2</sup>

#### Testing Requirements

Minimum Test Frequency		
Concrete – Slump AS 1012.3.1	< 4 m <sup>3</sup>	No requirement
Compressive Strength AS 1012.9	> 4 m <sup>3</sup>	As per MRS70
Geometrics		
Specified Tolerances	As per MRTS03	
Maximum Lot Size	Work Order	

## **WORK PREPARATION**

### **Plant Requirements**

Job truck

Bobcat / backhoe / loader

Concrete saw / pavement breaker

### **Materials**

Gabions as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Rock as per MRTS03 *Drainage Structures, Retaining Structures and Embankment Slope Protections*

Concrete or concrete material as per MRTS70 *Concrete*

### **Manpower Requirements**

Leading hand                    1

Labourers                        2

Operator                         1

Traffic controllers            2

### **Average Daily Production**

Not listed.

### **Particular Planning Points to Consider**

1. What has caused the defect? Schedule another Activity to correct this, if needed.
2. Make sure no other major maintenance or construction is scheduled for the area of the defect.
3. Are there any related defects?
4. Is an alternative remedy or major maintenance more appropriate?
5. Specify or mark out the area requiring repair.
6. Determine repairs required and obtain supervisor's approval of repairs and repair methods, and
7. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.

2. Determine area to be repaired:
  - a. from supervisor's instructions.
3. Repair the gabion or reinforced concrete wall:
  - a. in accordance with details in the specifications and Work Order.
4. Check the work against the Restoration Standards.
5. Leave work site safe and tidy:
  - a. remove all loose material.
6. Remove traffic control:
  - a. clean / repair, as necessary.

#### **876 Footway Deck Wearing Surface Repairs (Manual or Mechanical)**

Details to be advised.

#### **877 Repair Scouring / Deposition of Waterway Material**

Details to be advised.

#### **878 Remove Flood Debris from Waterways**

Details to be advised.

#### **879 Maintain Clear Waterways**

Details to be advised.

#### **880 Repair Roadside Fences**

##### **Description**

All work associated with the repair of roadside fencing.

##### **Applicable Specifications**

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>

The work shall include:

1. removal of fencing components
2. supply of new fencing components
3. straightening of existing posts
4. installation of new posts
5. erection of new fencing, and
6. transport of old components to the nearest maintenance depot.

##### **Restoration Standards**

The fencing shall be repaired to the requirements set out in the Work Order.



**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
880	Repair Roadside Fences	Metres

**Testing Requirements**

None listed.

**WORK PREPARATION****Plant Requirements**

Job truck

Excavating / post driving equipment

**Materials**

Wire, panels and posts

Miscellaneous (bolts, paint etc)

**Manpower Requirements**

Leading hand 1

Labourers 1 - 3

Operator As required

Traffic controllers As required

**Average Daily Production**

Not listed.

**Particular Planning Points to Consider**

1. Define the fencing for repair.
2. What has caused the defect? Schedule another Activity to correct this, if needed.
3. Make sure no other major maintenance or permanent works is scheduled for the area of the defect.
4. Are there any related defects?
5. Is an alternative remedy or major maintenance more appropriate?
6. Specify or mark out the length of fencing requiring repair, and
7. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

## **WORK PROCEDURES**

### **Sequential Steps and Check Points**

1. Establish traffic control - See Roadworks Signing Guide:
  - a. vehicle warning lights
  - b. traffic control devices
  - c. safety clothing, and
  - d. vehicle position.
2. Determine the work area:
  - a. from supervisor's instructions.
3. Repair fencing:
  - a. straighten posts, and
  - b. replace damaged components.
4. Check if painting is required:
  - a. if required, advise supervisor.
5. Check the work against the Restoration Standards.
6. Leave work site safe and tidy:
  - a. remove all loose material.
7. Remove traffic control:
  - a. clean / repair, as necessary.

### **882 Maintain Existing Waterway Protection**

Details to be advised.

### **883 Seal Gaps Between Culvert Elements / Wingwalls**

Details to be advised.

### **884 Repair Handrail / Barrier / Guard Rail Furniture**

Details to be advised.

### **885 'Make Safe' Accident Damage to Handrail / Barrier / Guard Rail Furniture**

Details to be advised.

### **886 Install / Maintain Bird Control Fencing**

Details to be advised.

### **887 Place Emergency Propping**

Details to be advised.

### **888 Clean Aggressive Contaminations from Steel Girders**

Details to be advised.

**889 Emergency Pavement Repairs on Structures (< 10 m<sup>2</sup>)**

Details to be advised.

**890 Service Passenger Facilities**

Details to be advised.

**891 Repair Passenger Facilities**

Details to be advised.

**892 Tunnel Maintenance / Servicing – General**

Details to be advised.

**895 Tunnel Maintenance / Servicing – General**

Details to be advised.

**896 Maintain Ground Area around Foundation(s) of Fabricated Structures for Traffic Signs (FSTS)**

Details to be advised.

**899 Other Miscellaneous Structure Work****Description**

Any other work carried out to miscellaneous structures not covered by Activity Numbers 860, 861, 862, 865, 870, 875, 880, 890 and 891.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
899	Other Miscellaneous Structure Work	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**900 OVERHEADS****901 RMPC Joint Maintenance Requirement Assessment****Description**

The joint departmental / Contractor assessment of the network for the purpose of determining the extent of Activities required for the forthcoming Contract Period.

**Applicable Specifications**

Reference	Title
MRTS02	<i>Provision for Traffic</i>

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
901	RMPC Joint Maintenance Requirement Assessment	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**902 Open Tender Establishment Setup Works**

Details to be advised.

**903 Inspections for Forward List of Works**

Details to be advised.

**904 Asset Management Fee**

Details to be advised.

**905 Community Engagement – Program Maintenance**

Details to be advised.

**906 Community Engagement – Rehabilitation**

Details to be advised.

**907 Preparation of Cultural Heritage Management Plan**

Details to be advised.

**908 Implementation, Monitoring and Maintenance of Cultural Heritage Management Plan**

Details to be advised.

**910 Preparation of Environmental Management Plan (Maintenance)****Description**

All works associated with the preparation and submission (including any amendments required for approval) of an Environmental Management Plan (Maintenance), EMP (Maintenance) for the Contract.

The EMP (Maintenance) must clearly indicate the Contractor's strategy and responsibility for environmental management, the name and qualifications of the Contractor's environmental representative and include details of the Contractor's procedures for monitoring and review of the EMP (Maintenance).

It should also detail the method for providing advice to the Principal and the Department of Environment or other relevant state or federal departments regarding incidents causing "material" or "serious environmental harm" (*Environmental Protection Act 1994*) as a result of works carried out.

The content of the Contractor's EMP (Maintenance) shall be in accordance with the department's *Road Project Environmental Processes Manual 1997*, and shall, as a minimum, include:

- Statement of Environmental Management Policy.
- Procedures in respect of:
  - erosion and sedimentation control
  - minimising the impact on flora and fauna

- waste management and contamination of land and waterways (including recycling and spills)
- cultural heritage
- control of noise, dust, vibrations and other nuisances
- chemical handling and storage (including bituminous materials and herbicides)
- solvent spillage
- integration of environmental considerations into water sourcing and disposal
- specific environmental measures as nominated by the Principal
- monitoring, auditing and corrective action
- environmental training
- environmental complaints and incident reporting, and
- emergency response procedures.

Procedures developed by the Contractor to minimise or mitigate potential environmental harm when undertaking Maintenance Activities are to be included in the Contractor's Work Instructions and/or Quality Manual, and should include:

- identification of Activities / locations on the site that have the potential to cause environmental harm, and
- assessment of the rest / significance of the potential environmental harm of these Activities generally and at specific locations.

Where there is significant risk of potential environmental harm, the Contractor must:

- adapt work procedures for identified Activities to minimise potential environmental impacts, and
- develop location specific procedures, where warranted, in accordance with departmental Technical Specifications or as agreed by the Principal and the Contractor.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
910	Preparation of Environmental Management Plan (Maintenance)	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

#### **911 Implementation, Monitoring and Maintenance of Environmental Management Plan (Maintenance)**

##### **Description**

All works associated with the implementation, monitoring and updated of Environmental Management Plan (Maintenance), over the Contract Period.

The following operations shall be included as part of this Activity:

- Obtaining approval for all Environmentally Relevant Activities (ERAs) prescribed by the Environmental Protection Act and Regulations for the work site
- All reasonable environmental performance against objectives and standards
- Monitoring and reporting of environmental performance against objectives and standards, and
- Payment of all fees due under all Acts, regulations and by-laws.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
911	Implementation, Monitoring and Maintenance of Environmental Management Plan (Maintenance)	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

#### 912 Payment of Permits and Fees (Environmental)

##### Description

The reimbursement of permits and fees paid by the Contractor as a result of compliance with the applicable Federal, State and Local Government Legislation.

##### Work Operations

The following operations shall be included as part of the above Activity:

- payment of the fees / permits by the Contractor
- the provision of evidence for payment of the above fees / permits (including a copy of the permit etc) to the Principal for reimbursement of the fee / permit amount
- demonstrated evidence that the requirements in relation to the receipt of permits / fees as detailed in the EMP Maintenance have been complied with, and
- all other operations included in the Applicable Specifications.

Where clarification of details in relation to the above Work Operations is required, the following Applicable Specifications provide additional requirements for compliance in these areas.

##### Applicable Specifications

All relevant legislative Acts and documents applicable to the obtaining of permits and fees.

##### Restoration Standards

Documented evidence of the payment of permits / fees is to accompany any claim for reimbursement.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
912	Payment of Permits and Fees (Environmental)	Dollars

##### Testing Requirements

Nil.

**Particular Points to Consider**

As part of the stewardship role, the Contractor shall notify the Principal of the relevant fees / permits necessary for attainment prior to applying and paying the fees / permits.

**920 Electricity Supply – Traffic Signals****Description**

The cost incurred for electricity charges for the running of traffic signals.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
920	Electricity Supply – Traffic Signals	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**921 Electricity Supply – Lighting****Description**

The cost of electricity supply incurred from a power authority for the operation of lighting asset facilities.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
921	Electricity Supply – Lighting	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**922 Phone Charges – Traffic Signals****Description**

The costs incurred for phone charges for Traffic Area Response System connection from controllers to node base.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
922	Phone Charges – Traffic Signals	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**923 Phone Charges – Traffic Signal Coordination****Description**

The costs incurred for phone charges for Traffic Area Response System connection from controllers to node base.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
923	Phone Charges – Traffic Signal Coordination	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

**930 Modification and Digitisation of Computerised As Constructed Plans****Description**

The updating of existing drawings to document As Constructed changes to the design, including the obtaining of electronic file from original source of design.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
930	Modify and Digitise Computerised As Constructed Plans	Dollars / Each (Plan)

No other details are included in the Maintenance Activity Standard for this Activity.

**931 Modification of Paper-Based As Constructed Plans****Description**

The updating of existing drawings to document as constructed changes to the design, including the obtaining of drawings from original source of design.

**Activity Items and Units of Measurement**

Item	Description	Units of Measurement
931	Modify Paper-Based As Constructed Plans	Dollars / Each (Plan)

No other details are included in the Maintenance Activity Standard for this Activity.

**932 Calibration of Road Safety Cameras**

Details to be advised.

**933 Survey Drawings for Road Safety Cameras**

Details to be advised.

**950 Damages Recovery****Description**

This Work Activity covers the rectification of Intelligent Transport Systems and Electrical (ITS&E) infrastructure assets damaged as a result of a physical impact, vandalism or another cause from the external environment and where the costs associated with the rectification can be recovered from the causing party (e.g. registration of colliding vehicle is captured, and the costs can be recovered via the insurance associated with the vehicle use).

It includes the work carried out on and associated hardware (i.e. pits, installation cabling) to rectify significant defects (i.e. knockdowns), as required, after the initial emergency 'make safe' callout. The



costs of the Contractor's initial attendance to the damaged asset(s) should also be captured in this Activity.

**Note:**

For this Work Activity emergency 'make safe' callout refers to urgent (unexpected / non-programmed) work necessary to make an installation safe. These are typically a higher priority than programmed Activities and may interrupt programmed Activities.

**Work Operations**

The Work Operations associated with this Work Activity may include, but not limited to:

- a) Replacement of defective components, footings and/or pits required to reinstate pole / post
- b) Restoration of equipment, including disconnection, removal, supply, installation, testing and commissioning of associated electrical installation cabling
- c) Other checks and associated work required in order to ensure equipment is working correctly and is in original operational condition
- d) When all lamps are operational again, clearing fault and error logs in the traffic controller after the work is complete
- e) Provide required reports, including photos and other evidence to support the claim
- f) Certification that the work performed meets the requirements of the Restoration Standards, including all necessary visual inspections, compliance (i.e. electrical certification – certificate of test) and audit testing
- g) Check and, if necessary, update the assets register to ensure the information in the assets register is current and accurate, and
- h) Visually check the condition of supporting structures and record the condition ratings (confirm / revise, as appropriate) in the department's asset management system. Ensure a record of the date of the condition rating inspection is recorded in the department's asset management system.

**Applicable Specifications**

Specifications which may apply to tasks undertaken when delivering this Work Activity may include, but not be limited to, the following:

<b>Reference</b>	<b>Title</b>
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS56	<i>Construction Surveying</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS93	<i>Traffic Signals</i>
MRTS94	<i>Road Lighting</i>
MRTS96	<i>Management and Removal of Asbestos</i>
MRTS97	<i>Mounting Structures for Roadside Equipment</i>

Reference	Title
MRTS170	<i>Public Utilities in Road Projects Site Works</i>
MRTS200	<i>General Requirements for Intelligent Transport Systems (ITS) Infrastructure</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS204	<i>Vehicle Detectors</i>
MRTS208	<i>Roadway Ancillary ITS Infrastructure Monitoring and Control</i>
MRTS210	<i>Provision of Mains Power</i>
MRTS211	<i>Pedestrian Push Buttons and Audio Tactile Drivers</i>
MRTS213	<i>UPS for Roadside Devices</i>
MRTS214	<i>Provision of Wireless Traffic Sensors (WTS)</i>
MRTS226	<i>Telecommunications Field Cabinets</i>
MRTS228	<i>Electrical Switchboards</i>
MRTS234	<i>Communications Cables</i>
MRTS251	<i>Traffic Counter/Classifier</i>
MRTS252	<i>Next Generation Traffic Signal Controllers</i>
MRTS253	<i>Traffic Signal Lanterns</i>
MRTS255	<i>Traffic Signal Controllers</i>
MRTS256	<i>Power Cables</i>
MRTS257	<i>Feeder Cable and Loop Cable for Vehicle Detector</i>
MRTS262	<i>Transportable Variable Message Signs</i>

### Restoration Standards

The damaged installation should be reinstated to the original operational condition or updated specifications and standards, if requested by the Principal.

### Activity Items and Units of Measurement

Item	Description	Units of Measurement
950	Damages Recovery	Dollars

### Testing Requirements

- a) The ITS installation should be tested in accordance with the applicable element of MRTS201 *General Equipment Requirements* and other relevant Technical Specifications.
- b) Electrical verification and testing in accordance with AS/NZS 3000 *Wiring Rules*, MRTS256 *Power Cables* and MRTS226 *Telecommunication Field Cabinets*.
- c) Cabinets (including Traffic signal Controller) installation should be tested in accordance with MRTS255 *Traffic Signal Controllers*, MRTS228 *Electrical Switchboards*, MRTS256 *Power Cables*, and other relevant Technical Specifications, as required.
- d) Concrete testing in accordance with MRTS70 *Concrete*.

- e) Traffic signal installation compliance testing in accordance with MRTS93 *Traffic Signals*, and
- f) Road lighting installation compliance testing in accordance with MRTS94 *Road Lighting*.

### Planning Points to Consider

N/A.

### 960 Alliance Performance Limb Payment

#### Description

All works associated with alliance performance limb payment.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
960	Alliance Performance Limb Payment	Dollars

No other details are included in the Maintenance Activity Standard for this Activity.

### 970 Licence and Ongoing Maintenance Fees for Transport and Main Roads Accepted Maintenance Management Systems (max. \$5,000 year / contract organisation)

#### Description

The ongoing MMS licence fee, maintenance / replacement cost of MMS field equipment.

#### Activity Items and Units of Measurement

Item	Description	Units of Measurement
970	Licence and Ongoing Maintenance Fees for Transport and Main Roads Accepted Maintenance Management Systems (max. \$5,000 year / contract organisation)	Dollars

Maximum amount per MMS per year is \$5,000.

No other details are included in the Maintenance Activity Standard for this Activity.

