

Guideline

Routine Maintenance Guidelines

November 2017

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1 Chapter 1: Routine Maintenance and Routine Maintenance Delivery

1.1 Introduction

Routine Maintenance Guidelines is the document that 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 the maintenance personnel to apply sensible and appropriate risk based methods to carry out the necessary maintenance actions as per the Intervention Level and Response Time (IL/RT) criteria and Maintenance Activity Standards.

Contractors undertaking Road Maintenance Performance Contract's (RMPCs) are required to refer to this guidelines, the RMPC Manual, General Condition of Contract, Invitation to Offer and their approved Quality for operational requirements. Road Asset Management Contractors (RAMC) may use these guidelines to manage routine maintenance related works in their contract.

1.2 Purpose

The intention of this document 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 RMPC Manual.

These guidelines shall apply to the maintenance of a road Network by a Contractor for the Queensland Department of Transport and Main Roads under RMPC Sole Invitee, (Road Asset Management Contract (RAMC) and for any other form of contract if it is established.

Purpose of the guidelines is to provide required technical standards and guidance to deliver consistent routine maintenance across the State.

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

1.3 Scope

The procedures and requirements for the following types of maintenance are described in this Routine Maintenance Guidelines document and the RMPC Sole Invitee Manual:

- 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, Rehabilitation works due to the size of the defect. Repairing 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 taken in response to an emergency situation on the road network.

1.4 Routine Maintenance Minor Works (*Minor Works within routine maintenance space*)

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 Routine Maintenance Performance Contract (RMPC) and should be funded by the relevant funding element which the defect belongs to. Routine Maintenance 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 Routine Maintenance Minor Works by taking into consideration:

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

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

1.5 Emergency Maintenance

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

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 Intervention Level and Response Time (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 six groups. These groups are intended to represent the maintenance priorities and the basic order in which 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 given below:

- **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 4.1.8.

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.

- **Priority 2 – Ordered Works**

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

Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous or likely to create unsafe situation to road users or likely to damage the road asset.

- **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 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).

- **Priority 4 – Legislative**

Defects that are required to be repaired by legislation.

These activities also cover Special 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).

- **Priority 5 – Preventative**

Defects that if treated will reduce 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.

- **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 five categories.

The Defects within each group 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 defects (Corporate Priority 2) in order to manage those defects consistently across the state. Refer to Chapter 4 of this guideline (Routine Maintenance Intervention Level and Response Time) 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 two digit alpha code descriptor is used to identify each particular Defect and five digit code descriptor is used to identify the 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 few activities that can be used to deliver other Maintenance Preservation and Operation (MPO) Element's Works that are beyond routine maintenance. For example, Maintenance Activity Number 147 is to 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 two Elements' Works. "Maintenance Activities mapped to Element" document provides all the maintenance activities with their relevant MPO Element.

A three 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 three character numeric code may be expanded with the addition of a further two 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 State Controlled Road Network (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) or,
- Pothole Patching with Emulsion/Aggregate (Activity Number 106) or,
- 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 includes 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 three character reference code
- applicable Queensland Department of 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
- 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 110, Surface Correction with Premix/Asphalt (Manual), is composed of the following Supplementary Work Items with the Department of Transport and Main Roads schedule Item Numbers where relevant:

- 955810 Preparation of existing surface
- 955820 Tack Coat
- 955860 Dense Graded Asphalt pavement, 14 mm mix
- 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 contractors' cost. Defect liability period for some of the Maintenance Activities may be available in district supplementary condition of the contract.

2.8 Typical RMPC Process

Appendix 1 indicates a process to manage routine maintenance works through Road Maintenance Performance Contract (RMPC). All the activities in this process are to be performed to a reasonably acceptable level in order to achieve efficient and effective routine maintenance work. In developing processes desecration of 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 frequency with the Department. Carrying out road inspection as agreed is critically important in order to capture and prioritise defects, as per IL/RT criteria, on the road Network.

The agreed inspection frequency 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 that are not 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 reason for the defect backlog. Defect Backlog must be revisited every inspection cycle in order to get the right priority as the defect may have deteriorated since 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 state-wide routine maintenance needs assessment 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, the critical issue is to ensure consistency of maintenance needs assessment across the District.

2.12.2 Routine Maintenance Needs Assessment using JMRA data

In order to have consistent JMRA data collection in state-wide level, a new JMRA methodology has been adopted by involving maintenance contractors, Transport and Main Roads district and Transport and Main Roads statewide team. 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.

2.12.2.1 JMRA data collection methodology

Over one hundred defect types are known within the road corridor under routine maintenance. All the defects that have been reached to its initial intervention level, as described in IL/RT, should be logged. However defect log collected in this way represents a snapshot of the Network condition and therefore cannot be solely used as JMRA of the Network for the forthcoming financial year.

However this defect log along with other data can be used to develop JMRA for the forthcoming financial year for districts and also to estimate routine maintenance needs in state-wide level.

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)
- 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 Routine Maintenance Minor Works.

2.12.2.2 Routine Maintenance Needs Assessment by using JMRA data – New approach

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. Following illustration explains how JMRA can be created by using 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 has planned rehab, reseal or other works in year 1.
- The Template given in the next page can be used to enter all the required data in order to calculate JMRA.

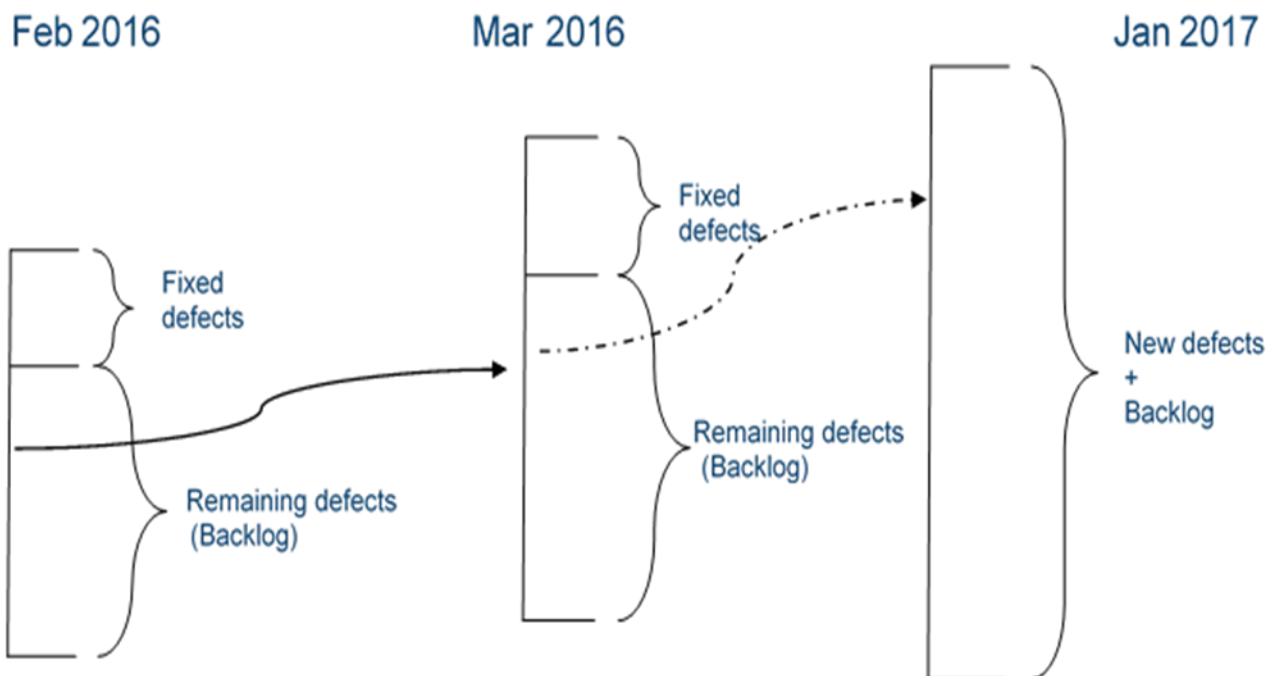


Figure 2.1.12.2 – Joint Maintenance Requirement Assessment – Data Collection Template

Routine Maintenance – Joint Maintenance Requirement Assessment – Data Collection Template																																								
District*																																								
Financial Year*																																								
Date	District ID	Road ID*	Road Section *		AADT	Road Category	Chainage *		Carriage way Code*	Lane *		Location (optional)			Defect Sub Code*	Defect Size*			Comments*	Defect Rectification*				Amount		Previous 11 months RM claimed works (escalated amount) (C)	RM forward list of works* (D)	Length of the planned rehab/reseal work*	Reduction of RM needs due to planned Rehab/Re seal works* (E)	Routine Maintenance needs (JRMA needs) A+B+C-D-E										
			TD Start*	TD End*			Start	End		LHS	RHS	OWP	Centre	IWP		Length/ Numbers	Width	Depth		Activity number*	Quantity*	Unit*	Unit Rate*	Pavement (A)	Roadside (B)															

*Mandatory data



Notes:




- All mandatory data to be collected by the districts.
- Preferably Road Section length is one km. Thus Through Distance Start and End (TD start, TD End) should be a full number such as 1, 2, 3, 10.
- Chainage is the starting point of the defect. For example; if TD start is 1 and TD End is 2, then chainage should be between 1 and 2 such as 1.45.
- Defect length to be recorded in the "Defect Size" field.
- If any routine maintenance work has been planned for a road section, then that amount to be recorded in the "RM forward list of works" field.
- If Rehab or Reseal work has been planned for a road section, then the length of the rehab/reseal work to be recorded in the "Length of the planned rehab /reseal work" field.
- Defect rectification data, Activity number, Quantity needed, Unit and Unit Rate to be recorded in the "Defect Rectification" field.
- Completed data to be sent to Element Leader by end of financial year.



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 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 rectification.




Table 3 – Routine Maintenance Defects Register




Defect Code	Defect Name	Image	Description	Possible Causes
AA	Isolated Depressions and Bumps in Bituminous Surface		<p>Localised depressed sections within a pavement. The depression 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 reason 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>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>




Defect Code	Defect Name	Image	Description	Possible Causes
AD	Shoving of Pavement or Asphalt		<p>Shoving is the formation of swells generally found in the edge of the wheel path due to traffic actions. 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. Poor bond between pavement layers.</p>
AF	Very Rough Surface (Isolated sections) in Bituminous Surface		<p>Localised area within a pavement that have affected the wearing course of the bituminous surface.</p>	<p>Loss, damage or corrugated surface course due to surface or underlying base course failure.</p>
AG	Potholes in Bituminous Surface		<p>Irregular bowl shaped cavity extending into pavement layers. Small, bowl-shaped cavity in the pavement surface that penetrate all the way through the surfacing layer down to the base course.</p>	<p>Untreated crocodile cracking permitting to loss the 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.</p>




Defect Code	Defect Name	Image	Description	Possible Causes
AG	Delamination in Bituminous Surface		<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>
BG	Crocodile Cracking in Bituminous Surface		<p>Small irregular shape polygons formed generally in wheelpaths. Plate/cell sizes are normally less than 150 mm.</p> <p>Crocodile cracking is load-related and it 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
BZ	Bituminous Surface Cracks General			
BZ	Block Cracks		<p>Block cracks generally form large interconnected rectangles on the pavement. Block cracks are not due to traffic loading.</p> <p>Block size and the shape generally reflect the joints of the base layer 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>
BZ	Transverse Cracks		<p>Unconnected cracks run laterally across the pavement. 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>
BZ	Diagonal Cracks		<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>




Defect Code	Defect Name	Image	Description	Possible Causes
BZ	Longitudinal Cracks		<p>Crack running longitudinally along the pavement. 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>
BZ	Meandering Cracks		<p>Non-load related unconnected irregular cracks on the pavement usually singly and varying in direction.</p>	<p>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.</p>
CA	Edge Break in Bituminous Surface		<p>Edge of the bituminous surface fretted, broken or irregular</p>	<p>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.</p>

Defect Code	Defect Name	Image	Description	Possible Causes
CC	Edge Drop-off in Bituminous Surface		<p>The vertical distance from the surface of the seal at the edge to the surface of the shoulder.</p>	<p>Inadequate pavement width. Shoulder material with inadequate resistance to erosion and abrasion. Resurfacing of pavement without resurfacing of shoulder.</p>
CC	Edge Rollover in Bituminous Surface		<p>The vertical distance from the new overlay / resealed pavement surface to the existing sealed pavement layer.</p>	<p>Inadequate new overlay / resealed pavement surface width. New overlay / resealed pavement not replaced over full width of existing pavement. New overlay edge has not appropriately constructed to make safe transition to previous surfacing layer or shoulder.</p>
DC	Flushing, Bleeding Seal		<p>Presence of excess bitumen in the pavement surface layer which creates patches with low skid resistance due to inadequate tyre-to-stone contact.</p>	<p>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.</p>




Defect Code	Defect Name	Image	Description	Possible Causes
DE	Ravelling Seal		<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.</p>	<p>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.</p>
DE	Stripping Seal		<p>Removal of the course 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.</p>	<p>Low binder contents. Poor binder to stone adhesion (dirty or hydrophilic aggregates, without effective precoating 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.</p>
DZ	Other Bituminous Surface Texture Defects (i.e. Polishing Seal)		<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 un-trafficked areas. Polished areas will feel relatively smooth and will sometimes be noticeably shiny.</p>	<p>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).</p>



Defect Code	Defect Name	Image	Description	Possible Causes
EA	Loose Stones or Debris on Sealed Roadway		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		Vegetation growth around kerb and channel, along fence lines and on the road pavement that create unsafe road condition.	Lack of vegetation control measures in place.
ED	Deceased Animals on Roadway		Carcass on the Roadway.	Livestock, pets & native animals struck and/or killed by vehicles travelling on Roadway.




Defect Code	Defect Name	Image	Description	Possible Causes
EE	Rough Manhole Covers and Grates (Rough Service access facility)		Manhole cover or Grates which are not vertically align with the road surface.	Damage to manhole covers and grates caused by environmental issues, lack of maintenance or a range of light, medium & heavy class vehicles travelling on Roadway. Pavement repairs or surface correction around the manhole covers or grates.
RV	Debris on Sealed Shoulders		Debris / foreign material / litter on sealed shoulders.	Wind, water, vehicle or road user made transportation of debris onto or away from the shoulder surface.
ZB	Depressions Service Reinstatement (Rough Service Trench Reinstatement)		An area of pavement surface where the original has been replaced. Reconstruction patches are usually straight sided.	Excavation for new and/or existing services.



Defect Code	Defect Name	Image	Description	Possible Causes
GA	Insufficient (Adverse) Crossfall in Unsealed Shoulder		Insufficient camber or slope of the unsealed shoulder from the edge line.	Initial Insufficient crossfall during the construction. Lack of shoulder maintenance.
GB	Excessive Crossfall in Unsealed Shoulder		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 sub-base or subgrade.
GC	Lateral Scour Channels in Unsealed Shoulders		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.



Defect Code	Defect Name	Image	Description	Possible Causes
GE	Hazardous Dry Loose Material in Unsealed Shoulders		<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.</p>	<p>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.</p>
GH	Ruts in Unsealed Shoulders		<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.</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>

Defect Code	Defect Name	Image	Description	Possible Causes
GG	Debris on Unsealed Shoulder		Foreign material or debris on unsealed shoulder.	Wind, water or manmade transportation of debris onto or away from the shoulder surface.
GK	Reduced Shoulder Width in Unsealed Shoulders		Inadequate shoulder width to accommodate road user safety or pavement integrity.	Inadequate initial compaction. Variable quality of paving materials. Reduction of shoulder design width.
GL	Potholes in Unsealed Shoulder		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.




Defect Code	Defect Name	Image	Description	Possible Causes
GZ	Shoulder Defects, General		Any shoulder defects likely to create unsafe road condition.	Accumulation of foreign materials or debris on the shoulder. Lack of shoulder maintenance.
GZ	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
HD	Wheel Ruts in Unsealed Roadways		<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>
HE	Shoving in Unsealed Roadways		<p>Plastic bulging of pavement surface commonly occurring in association with depression or rutting.</p>	<p>Plastic deformation of pavement or subgrade.</p>
HF	Insufficient Crossfall in Unsealed Roadways		<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>




Defect Code	Defect Name	Image	Description	Possible Causes
HG	Excessive Crossfall in Unsealed Roadways		Excessive camber or slope from the crown of the road to sides of the road.	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.
HM	Potholes in Unsealed Roadways		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.




Defect Code	Defect Name	Image	Description	Possible Causes
HN	Insufficient Formation Height Above Natural Surface		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.
HP	Loss of Pavement Running Course		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
HZ	Unsealed roadway defects, general			
HZ	Corrugations		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.
HZ	Scour channels		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.




Defect Code	Defect Name	Image	Description	Possible Causes
HZ	Loose material		<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.</p>	<p>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.</p>
HZ	Course surface		<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>
KZ	Surface Drain Defects		<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>




Defect Code	Defect Name	Image	Description	Possible Causes
LA	Drainage Obstructed		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)	Damaged or missing sections of drain. Blocked by debris, stones, roots and branches caused by environmental or human intervention.
LP	Silt or Debris on Floodway Sections		Any silt or debris encroaching into floodway sections of roadway.	Wind, water or manmade transportation of silt or debris onto or away from the floodway surface.
LZ	Culvert, Pipe, Pit & Floodway Defects, Other			
LZ	Damaged or missing drainage pit lids, surrounds, grates, in pedestrian areas or traffic lanes.		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 & maintenance period not carried out.




Defect Code	Defect Name	Image	Description	Possible Causes
LZ	Cracking in culvert components or visible movement.		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 & maintenance period not carried out.
LZ	Misalignment/ separation of culvert components.		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 & maintenance period not carried out.
LZ	Corrosion/ loss of section of steel components (including reinforcement in concrete structures).		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 & maintenance period not carried out.




Defect Code	Defect Name	Image	Description	Possible Causes
LZ	Culvert or end structure silted up		Visible movement of culvert, component or end structure.	Culvert blocked by debris, stones, roots and branches caused by environmental or human intervention.
LZ	Scouring around culvert components.		Scouring around culvert components.	Culvert blocked by debris, stones, roots and branches caused by environmental or human intervention. Outlet not free flowing.
YA	Cracks in Concrete Roadway			
YA	Block Cracks		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.




Defect Code	Defect Name	Image	Description	Possible Causes
YA	Longitudinal Cracks		<p>Unconnected crack running longitudinally along the pavement. Can occur singly or as series of almost parallel cracks.</p>	<p>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.</p>
YA	Transverse Cracks		<p>Unconnected crack running transversely across the pavement/slab.</p>	<p>Normal shrinkage. Shrinkage of slab during curing, associated with excess slab lengths or joints sawn too late. Insufficient slab thickness. Rocking of slab.</p>
YA	Corner Cracks		<p>A crack that intersects the slab joints near the corner. A crack extending diagonally from a longitudinal edge to a transverse joint.</p>	<p>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.</p>

Defect Code	Defect Name	Image	Description	Possible Causes
YB	Spalling of Joints - Concrete Pavement		Cracking, breaking or chipping of joint/crack edge.	Reduces slab contact area and provides 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.
YB	Joint Sealant Defects in Concrete Pavement		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 (for example, 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.
YC	Potholes in Concrete Pavement		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.



Defect Code	Defect Name	Image	Description	Possible Causes
YD	Sunken Concrete Pavement Slab (Stepping)		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.
YE	Patches in Concrete Pavement		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.
MZ	Subsoil Drain Defects		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
NC	Grass not in sight line		<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.</p>	<p>Roadside vegetation not maintained and encroaches into the road reserve.</p>
NE	Large Trees and Shrubs Close to Roadway		<p>Unattended trees grown in road reserve close to the trafficked lanes.</p>	<p>Ongoing maintenance not carried out in accordance with departmental requirements & standards.</p>
NF	Declared Plants		<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.</p>	<p>Declared Plants allowed to propagate throughout the Network.</p>




Defect Code	Defect Name	Image	Description	Possible Causes
NG	Trees or Limbs Likely to Fall on Roadway		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 & standards.
NH	Grass, Trees and Shrubs in Sight Line, in Drain or Obstructing Roadside Furniture		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 & standards. Roadside vegetation not maintained and encroaches into the road reserve.
NK	Landscaping Defects		Any road side landscaping that has impact on road functionality.	Neglected landscaping or ongoing maintenance not carried out in accordance with departmental requirements & standards.




Defect Code	Defect Name	Image	Description	Possible Causes
NL	Grass Growth on Medians		Visible grass growing in medians that has impact on road usability or aesthetic performance.	<p>Ongoing vegetation maintenance not carried out in accordance with departmental requirements & standards.</p> <p>Sweeping and maintenance on road side medians not carried out appropriately.</p>
PA	Litter, Below Standard Amenity Furniture in Rest Area		Unusable amenity, furniture or overflowing litter bins in rest areas.	<p>Person or persons leave or abandon litter and/or rubbish within the Rest Area.</p> <p>Timely litter bins emptying, maintaining rest area amenity and furniture process not in place.</p>
PB	Dead Trees or Limbs in Rest Area		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 & standards.




Defect Code	Defect Name	Image	Description	Possible Causes
PC	Routine amenity servicing		Damaged, vandalised or cleanliness facility unusable.	Person or persons leave or abandon litter and/or rubbish, damage or vandalise the Rest Area Facility.
PZ	Rest Area Defects Other		Any rest area defects, that are not covered in above, make facility unsafe or unusable.	Ongoing maintenance not carried out in accordance with departmental requirements & standards.
RA	Unauthorised Signs		Unauthorised signs erected within the road corridor	Signs installed by unauthorised person or persons without proper approval.




Defect Code	Defect Name	Image	Description	Possible Causes
RB	Unstable Batter/ Embankment, Missing Material		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.
RC	Damaged Concrete or Paving Blocks		Damaged, displaced concrete or paving blocks in pedestrian areas, road environment.	Damage to concrete or pavement block caused by environmental, human or vehicular intervention.



Defect Code	Defect Name	Image	Description	Possible Causes
RD	Loose earth, Rock in Sight Line		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.
RE	Litter on Road Reserve		Litter dumped on the road reserve.	Person or persons leave or abandon litter and/or rubbish within the road reserve.
RF	Graffiti		Any graffiti considered offensive and highly visible to public. Graffiti affects road signs legibility.	Person or persons graffiti signs, buildings, fences, structures, vehicles with highly visible or offensive material.


Defect Code	Defect Name	Image	Description	Possible Causes
RG	Scoured Areas on the Road Reserve		<p>Steep, irregularly sided, relatively linear feature, commonly in the direction of maximum slope or along a wheelpath on unsealed roads.</p>	<p>Water flows over the road reserve due to blocked culverts caused by environmental or human intervention. Lack of proper drainage facility.</p>
RH	Abandoned Vehicles		<p>Abandoned vehicle or equipment in road reserve.</p>	<p>Person or persons leave or abandon vehicle in road reserve.</p>
RK	Illegal Accesses		<p>An access that doesn't 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>



Defect Code	Defect Name	Image	Description	Possible Causes
RL	Illegal Turning Areas		<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>
RM	Landscape Vegetation Defects		<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 & standards.</p>
RN	Damaged Qld Dept. of Main Roads Fencing		<p>Missing or damaged Transport and Main Roads 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
RP	Damaged Qld Dept. of Main Roads Noise Barrier Fencing		Missing or damaged departmental Noise Barrier Fencing in road reserve.	Noise Barrier Fencing is missing or damaged due to environmental, human or vehicular intervention. No proper periodic maintenance program in place.
RR	Damaged or Unserviceable Bus Shelters		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.
RT	Sediment Pond Defects General		Silted or unserviceable Sedimentation Pond Facilities.	Sediment pond not acting in accordance with design. No proper periodic maintenance program in place.


Defect Code	Defect Name	Image	Description	Possible Causes
RW	Damaged Roadside Weighing Area		Damaged or unserviceable Roadside Weighing Area.	<p>Roadside Weighing Area is unserviceable or damaged due to environmental, human or vehicular intervention.</p> <p>No proper periodic maintenance program in place.</p>
SA	Missing, Damaged or Dirty Regulatory, Warning or Hazard Sign		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.
SB	Missing or Defective Guide Sign		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.



Defect Code	Defect Name	Image	Description	Possible Causes
SC	Sign Misalignment		<p>Sign is on a noticeable lean, inclined to line of sight or reflecting glare from vehicles lights at night.</p>	<p>Signage has become misaligned due to environmental, human or vehicular intervention.</p>
TA	Guide Post or Delineator Defects		<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).</p>	<p>Guide post or delineators is missing or damaged due to environmental, human or vehicular intervention.</p>

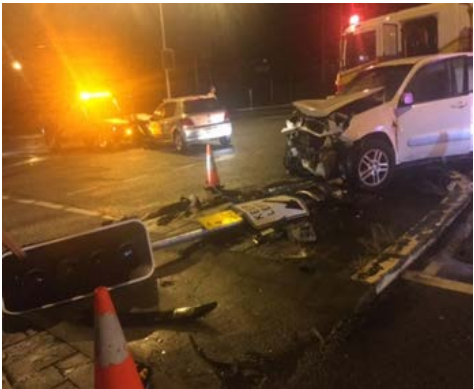
Defect Code	Defect Name	Image	Description	Possible Causes
TB	Reference Marker Defects		Reference Marker not visible or missing	Reference Marker is missing or damaged due to environmental, human or vehicular intervention.
TC	Guardrail, Fencing and Concrete Barrier Structural Defects		Damaged and/or missing guardrail, guardrail components, fencing or concrete barriers.	Guardrail, Fencing or Concrete Barrier is missing or damaged due to environmental, human or vehicular intervention.


Defect Code	Defect Name	Image	Description	Possible Causes
TD	Kerb or Dyke Defects		Continuous kerbing damaged or missing.	Kerb or Dyke is missing or damaged due to environmental, human or vehicular intervention.
TE	Guardrail, Fencing and Concrete Barrier Appearance Defects		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.




Defect Code	Defect Name	Image	Description	Possible Causes
UA	Missing or Faded Painted Road Lines and Markings		Road marking are faded, missing, incomplete or unsatisfactory.	Road Lines and Markings are missing or damaged due to environmental, human or vehicular intervention.
UE	Raised Pavement Marker Defects		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
VA	Traffic Signal Controller Defects		<p>Flashing Yellow:</p> <ul style="list-style-type: none"> • Site blacked out • Confusing signal displays • Controller knocked down • Stuck in phase/ not cycling • Safety critical times too short • Skipping phase, not serving vehicle or pedestrian demands • Train (Heavy Rail) interface not operating correctly • Tram (Light Rail) interface not operating correctly • Two lamps out or more per signal group failure • Twisted & non conflicting lantern arrangement; • Lamps out (other than pedestrian "Don't Walk" lamps); • Visors or louvres missing or damaged; • Lenses damaged; • Missing/defaced labelling. • Security access lock damaged • facility switch damaged / jammed / inoperable • conflicting signal groups activated (conflict monitor fault) • loop detector module not operational. 	<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>



Defect Code	Defect Name	Image	Description	Possible Causes
VB	Traffic Signal Lantern Defects		<p>Flashing Yellow:</p> <ul style="list-style-type: none"> • Confusing signal displays • Misaligned lantern causing confusing signal displays • Damaged or open door on lantern • Damaged lantern or lantern parts at risk of falling • Twisted & non Confusing lantern arrangement • Missing or damaged hardware (i.e. missing pole and/or associated hardware) • Lamp outages • Visors, cowls, louvers or target boards missing or damaged • poor lantern aiming • loss of displays. 	Broken or operationally degraded signal lanterns.
VC	Traffic Signal Electrical Defects		<p>Flashing Yellow:</p> <ul style="list-style-type: none"> • Damaged or missing finial cap/traffic signal mast arm junction box/ JU pole terminal panel cover/controller cabinet door • Hanging or damaged cables • Exposed terminals wires/cables • Audio tactile unit fault. • Excessive heat load or high impedance joints (poor electrical conductivity) as detected through thermal imaging • any electrical touch potential present on poles 	Electrical faults or damage of the traffic signal.




Defect Code	Defect Name	Image	Description	Possible Causes
VD	Traffic Signal Hardware Defects		<ul style="list-style-type: none"> • Confusing signal displays • Damaged and dangerous post/pole (including knockdowns) • Controller knocked down; • Damaged push button • Push button not operating and not placing a demand • Stuck in phase/ not cycling • Skipping phase, not servicing vehicle or pedestrian demands • Trivision sign fault causing confusion • Audio tactile unit fault. • Misaligned & non confusing lantern arrangement • Missing or damaged hardware (i.e. missing pole and/or associated hardware). • Lamp outages • Visors, louvers or target boards missing or damaged • poor lantern aiming • loss of displays • failed inductive loops or loop feeder cables. • Finish, controller obviously out of plumb, pole obviously out of plumb, signal hardware out of plumb, Tidiness, Cleanliness, and so on • Pedestrian walk phase lanterns failed / mis-aligned. 	Broken or missing traffic signal hardware.




Defect Code	Defect Name	Image	Description	Possible Causes
VE	Traffic Signal Defects other		<ul style="list-style-type: none"> • Vehicle detector is manually or through fault ,locked-on operating and placing a traffic phase demand • Heavy Rail detector locked on or not operating • Queue detection equipment on ramp metering (on Ramps & Off Ramps • UPS Failure • Misaligned & non confusing lantern arrangement • Missing or damaged hardware (i.e. missing pole and/or associated hardware). • Lamp outages • Loss of displays • Failed inductive loops. • Finish, controller obviously out of plumb, pole obviously out of plumb, signal hardware out of plumb, Tidiness, Cleanliness, etc. • Detector failures causing phases to be called and/or extended unnecessarily • Communications failure • Timing fault (not safety critical times) • Button failures causing phases to be called and/or extended unnecessarily Any defect such as given • Traffic Signal pedestal damaged • loss of grouting on poles 	<p>Below have potential to cause dangerous or hazardous situation.</p>


Defect Code	Defect Name	Image	Description	Possible Causes
VG	Electrical Cables Defects		<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>
VH	Inductive Loop Defects (Not at a traffic signal installation)		<p>Broken or operationally degraded Inductive loop:</p> <ul style="list-style-type: none"> damaged pits or conduits. 	<p>Cable pits damaged by environmental, human and vehicular impacts.</p>
VJ	Emergency Phone Defects		<p>Unsafe, broken and/or operationally degraded emergency phone site.</p>	<p>a) Handset off holder b) Missing, damaged or faulty hardware.</p>

Defect Code	Defect Name	Image	Description	Possible Causes
QA	Lighting switchboard defects		<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>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>

Defect Code	Defect Name	Image	Description	Possible Causes
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"> • Damaged pits or conduits 	<p>Cable pits damaged by environmental, human and vehicular impacts.</p>
QD	Lighting general defects		<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>

Defect Code	Defect Name	Image	Description	Possible Causes
WD	Bridge Defects General - Debris on Bridges		<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>
ZZ	Emergency Call Out		<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 & testing not carried out in accordance with departmental requirements & standards.</p>
JA	Bike path/lanes Surface defects		<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>

Defect Code	Defect Name	Image	Description	Possible Causes
JB	Vegetation defects - Bike paths		<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 & standards.</p>
JC	Drainage defects - Bike paths		<p>Culverts, pipes and pits defects likely to impact on the integrity of the unit. Obstructed drainage cause 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>
JD	Bike path Defects General		<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
XA	Inspection Needed		Additional inspection needed by 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 intervention levels and response times 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 a 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
- Provide 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.

Five major road maintenance categories are adopted across whole of the Queensland State Controlled Road Network based on Annual Average Daily Traffic (AADT). Those road categories are:

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

4.1.2 Corporate Priorities

- **Priority 1 – Hazard**

Defects where the likelihood of harm occurring is greater than a safety defect as determined by the hazardous defect identification procedure.

- **Priority 2 – Ordered Works**

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

- **Priority 3 – Safety**

Defects that are considered to be of a safety nature.

- **Priority 4 – Legislative**

Defects that are required to be repaired by legislation.

- **Priority 5 – Preventative**

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

- **Priority 6 – Appearance/Usability**

Defects that are considered a nuisance or unsightly.

Section 2.1 provides further information about the defect 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 RMPC inspection cycle as indicated in the RMPC quality plan.

4.1.4 Upper Intervention Level

Maximum desirable physical dimensions or severity of a defect that can be left on the Network without rectifying unless the defect is a hazard. All the defects must be rectified before breaching the upper intervention level under unconstrained budget. In the case of constrained budget, defects must be prioritized 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. Hazardous defect in the IL/RT model is an example for that.

These defect intervention levels are set out in IL/RT model in Chapter 4.

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

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 their Response Time.

Response time starts when a defect has reached to its upper intervention limits. If a defect has reached to its upper intervention limit between two inspection cycles, then the response time starts from the latest inspection date. Therefore fulfilling Network inspection as per the agreed frequency is critically important.

4.1.6 Defect code

Two digit defect code is used to distinguish the routine maintenance defects in the IL/RT model. Below are examples for defect codes used in IL/RT model:

- AA - Isolated Depressions
- DE – Ravelling or Stripping Seal
- HD - Wheel Ruts in Unsealed Roadways

4.1.7 Defect sub code

Defects are grouped into further level by considering their physical dimensions or severity level. There are six sub defects types in the IL/RT model:

- H: defect in hazardous level
- P: defect in Principal ordered Works
- I: defect within intervention levels
- R: defect in response time
- M :defect in monitoring stage
- W: defect to be treated under unsealed roads Work Program

Below are the examples for typical sub defects:

- AA1_H: Isolated depression in hazardous level
- DE2_P: Ravelling or Stripping within Principal ordered Works
- AA1_I: Isolated depression within intervention levels
- AA2_R: Isolated depression within response time
- AA2_M: Isolated depression in monitoring stage
- HD2_W: Wheel ruts in unsealed roadways to be treated under unsealed roads Work Program

4.1.8 Defect Scoring

All the defects captured during the road inspections are to be prioritized 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 the defects have been prioritized, all the safety defects (corporate priority 3) may not be fixed due to lack of funding and as a result, contractor doesn't know which safety defects should be repaired as all of them have a same priority level.

Therefore it is essential to extend the defect prioritising methodology to prioritise the defects that sit within the corporate priority. The Defect Scoring methodology in IL/RT model enable contractors to prioritize defects found within the corporate priority.

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

$$\text{Corporate Score} = \text{Corporate weighting} + \text{Field weighting} + \text{Location Score}$$

Corporate weighting

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

Field Weighting

Field weighting should be allocated by the road inspectors during the defect logging in the road inspection. The defects' impact on road deterioration is the sole influence factor for field weighting. Field weighting varies from 1 to 4 as given below:

- Asset rapid deterioration due to defect – 4

- Asset moderate deterioration due to defect - 3
- Asset low deterioration due to defect – 2
- 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
- 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 users, the following must be considered, as a minimum following by a likelihood and consequences risk assessment procedure:

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

Figure 4.1.9.1 – Hazard matrix

Likelihood	High			
	Medium			
	Low			
		Low	Medium	High
	Consequences			
Hazard		Not a Hazard		

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). Defect Likelihood is the probability that a defect will cause a crash/accident due to a combination of individual factors

Table 4.1.9.1(a) – Factors contribute to likelihood

Maximum Intervention Level	Score	Your Score	Likelihood Rating
> maximum intervention level	3		
< maximum intervention level	1		
Traffic Flow Rate	Score	Your Score	<p style="text-align: center;">> 20 = High 12 to 20 = Medium <12 = Low</p>
> 1000 vph	3		
> 100 vph	2		
< 100 vph	1		
Traffic Composition	Score	Your Score	
> 20% cyclists and motor cyclists	3		
> 10% cyclists and motor cyclists	2		
< 10% cyclists and motor cyclists	1		
Speed Environment	Score	Your Score	
> 100 km/h	3		
> 80 km/h < 100 km/h	2		
< 80km/h	1		

Location (lateral position)	Score	Your Score	Likelihood Rating
Within wheel path	5		
Adjacent to wheel path	3		
On the shoulder	1		
Other	0		
Visibility because of the terrain, prevailing weather conditions or local factors such as roadwork	Score	Your Score	
Hidden	5		
Less than safe stopping distance	3		
Greater than safe stopping distance	1		
Weather Conditions	Score	Your Score	
Flooding	5		
Ongoing wet conditions	3		
Showers	1		
Fine	0		
Dust Conditions	Score	Your Score	
High	5		
Medium	3		
Low	1		
Fine	0		
Road Configuration	Score	Your Score	
2 lane	3		
> 2 lane - lane undivided	2		
> 2 lane - land divided	1		
Trafficable width per carriageway	Score	Your Score	
< 6 m	3		
6 m < 8 m	2		
> 8 m	1		

> 20 = High
12 to 20 = Medium
<12 = Low

Your Score	Your Rating
	Low

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:

1. During normal working times – 20 minutes plus normal travel time to site.
2. 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 network.

Alternative emergency action

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

1. Immediately notify the local Police and request assistance (for a defect constituting an immediate danger), or
2. 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-clause is intended to apply only in exceptional circumstances where 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. Noting in this clause is intended to limit 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 Qld Fire Brigade, Rural Fire Brigade, fire control officer of the Forestry Commission or the National Parks and Wildlife Services).
- For hazardous materials, contact the Qld Fire Brigade.
- For Pollution Incidents, contact the Qld Environment Protection Authority.
- 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.
- 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

Defect Intervention Level & Response Time(IL/RT) criteria for Routine Maintenance

Defect No	Defect Code	Defect Intervention Level Criteria / Description	Initial Intervention level	Corporate Priorities	Road Category →		Category A vpd > 30000	Category B vpd 10000-30000	Category C vpd 500 - 10000	Category D vpd 100-500	Category 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												
					Corporate Priority weighting (A)	Field Weighting (B)	Code Score (A+B)	Upper Intervention Level / Response Time	Corporate Score (A+B+C)	Upper Intervention Level / Response Time	Corporate Score (A+B+C)			Upper Intervention Level / Response Time	Corporate Score (A+B+C)	Upper Intervention Level / Response Time	Corporate Score (A+B+C)	Upper Intervention Level / Response Time	Corporate Score (A+B+C)
Defect Category 01 - Deformation and Potholes in Bituminous Surface																			
1	AA	Isolated Depressions and Bumps in Bituminous Surface																	
	AA1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard					20	110 111	See Hazard procedure				
	AA2_I	Area of ponding of water (not free draining) in the wheel path exceeds 3 m ² : (free draining means water disperses without action of traffic)	3 m ²	3 - Safety	2		2	5 m ²	10	10 m ²	8	15 m ²	6	20 m ²	5	20 m ²	4	161 155 157	

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	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		169		
	AA3_I	Depression or bump on sealed pavements measured using a 1.2 m straight edge exceeds 20 mm:	20mm	3 - Safety	2	2	30 mm	10	40 mm	8	50 mm	6	75 mm	5	100 mm	4		143		
	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		144		
	AA4_M	Depression or bump on sealed pavements measured using a 1.2 m straight edge is less then 20 mm:	20mm	5 - Preventative	1	1	Log the defect and monitor if ponding area is greater than 1 m2 or depth exceeds 10mm										1	141		
																		112		
2	AB	Ruts in Bituminous Surface																		
	AB1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	147	
	AB2_I	Area of ponding of water (not free draining) in the wheel path exceeds 3 m ² : (free draining means water disperses without action of traffic)	3 m ²	3 - Safety	3	3	5 m ²	11	10 m ²	9	15 m ²	7	20 m ²	6	20 m ²	5		148		
																		139		
																		140		
																		146		
																		149		
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	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		160			
	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		137			
	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		151			
	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 ² or depth exceeds 10 mm										1		152		
																		153			
3	AD	Shoving of Pavement or Asphalt																	154		
	AD1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20		155	See Hazard procedure

	AD2_I	Area of ponding of water (not free draining) in the wheel path exceeds 3 m ² : (free draining means water disperses without action of traffic)	3 m ²	3 - Safety	3		3	5 m ²	11	10 m ²	9	15 m ²	7	20 m ²	6	20 m ²	5	140	
																		169	
																		143	
	AD2_R	Area of ponding of water (not free draining) in the wheel path exceeds the upper intervention level in AD2_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	144	
																		141	
																		151	
	AD3_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	129	
																		113	
																		145	
	AD3_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 AD3_I	Upper IL	3 - Safety	4		4	4 weeks	12	4 weeks	10	3 months	8	4 months	7	6 months	6	146	
																		147	
																		148	
	AD4_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 ² or depth exceeds 10 mm									1	110	
								111											
								139											
	AD5_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	149	
																		150	
																		152	

	AD5_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 AD5_I	Upper IL	3 - Safety	5	5	2 days	13	1 week	11	2 weeks	9	4 weeks	8	5 weeks	7				
	AD6_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:	50mm	5 - Preventative	1	1	Log the defect and monitor if depth exceeds 30 mm										1			
4	AF	Very Rough Surface (Isolated sections) in Bituminous Surface																		
	AF1_H	Any verified defect (not meeting the requirements of AA, AB, AD or AG) identified by inspections or complaint that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	110 107 111 143 161 145 155 157 160 169 112	See Hazard procedure

																				151			
																				152			
																				113			
																				146			
																				146			
																				147			
																				148			
																				153			
																				154			
5	AG	Potholes/ Delamination in Bituminous Surface																					
	AG1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20		See Hazard procedure			
	AG2_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				105		
	AG2_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				106		
																					107		
																					142		
																					146		
	AG3_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										1					
	AG4_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						

	AG4_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					
	AG5_M	Depth on sealed pavements is less than 30 mm	30 mm	5 - Preventive	1	1	Log the defect and monitor if depth exceeds 20 mm										1				
	AG6_P	Any pothole in the wearing surface that results in the loss of material under traffic	NA	2 - Ordered work	9	9	18	As advised by Principal													
Defect Category 02 - Cracks in Bituminous Surface																					
6	BG	Crocodile Cracking in Bituminous Surface																			
	BG1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	145	146	See Hazard procedure
	BG2_M	Plate size is less than 100 mm	100 mm	5 - Preventive	1	1	Log the defect and monitor if plate size exceeds 50 mm										1	122	143		
	BG3_R	Moisture is entering/leaving the pavement	NA	5 - Preventive			1	9 months	9	9 months	7	12 months	5	12 months	4	12 months	3		120	139	

7	BZ	Bituminous Surface Cracks General																		
	BZ1_H	Cracking that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	120 123	
	BZ2_R	Individual crack width exceeds 3 mm or fine pumping	3mm	5 - Preventative	1		1	9 months	9	9 months	7	12 months	5	12 months	4	12 months	3		118 117 115 122 121 101 110 111 112 139	Manage at local level(6 months or before wet weather)
Defect Category 03 - Edge Defects Bituminous Surface																				
8	CA	Edge Break in Bituminous Surface																		
	CA1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	101 102 103	
	CA2_I	<u>Unsealed Shoulder</u> From the average existing seal width, edge break exceeds 75 mm	75 mm	3 - Safety	1		1	NA	9	100 mm	7	125 mm	5	150 mm	4	150 mm	3		169 139	Edge break with narrow lanes (less

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	CA2_R	<u>Unsealed Shoulder</u> From the average existing seal width, edge break exceeds the upper intervention level in CA2_I	Upper IL	3 - Safety	2		2	NA	10	4 week	8	4 week	6	4 weeks	5	4 weeks	4		140 221	then 3 m wide lanes) to be prioritised on case to case basis
	CA3_M	<u>Unsealed Shoulder</u> 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										1		
	CA4_I	<u>Sealed shoulder (at least 500 mm width)</u> 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	<u>Sealed shoulder (at least 500 mm width)</u> 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										1			
9	CC	Edge Drop off in Bituminous Surface																		
	CC1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	101 102 103	See Hazard procedure
	CC2_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	NA	NA	60 mm	8	75 mm	6	75 mm	5	75 mm	4	169 215 221 222	Edge drop-off with narrow lanes (less than 3m wide lanes) to be prioritised on case to case basis		
	CC2_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	NA	NA	4 weeks	10	2 months	8	2 months	7	2 months	6	216 217 218 219 229 139			

	CC3_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				
	CC3_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				
	CC4_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										1			
Defect Category 04 - Surface Texture Deficiencies Bituminous Surface																				
10	DC	Flushing, Bleeding Seal																		
	DC1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20		See Hazard procedure

	DC2_R	Bleeding leads to bitumen pick up on vehicle tyres likely to result in complaints	NA	3 - Safety	5	5	5	1 day	13	1 day	11	1 day	9	1 day	8	2 days	7	118		
																		117		
	DC3_P	Any fatty strips is 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 works	9	9	18	As advised by Principal											119	
																		139		
11	DE	Ravelling or Stripping Seal																		
	DE1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	118	See Hazard procedure
																		155		
	DE2_P	Any ravelling on a horizontal curve or approach to or within an intersection exceeds 5 m ²	5 m ²	2 - Ordered works	9	9	18	As advised by Principal										18	117	
	DE3_R	Any stripping in an area exceeds 10 m ²	10 m ²	5 - Preventative	1		1	Log the defect monitor and inform to Principal										1	115	
																		114		
	DE4_R	Any ravelling or stripping where the gravel pavement visibility exceeds 1 m ²	1 m ²	5 - Preventative			1	Log the defect monitor and inform to Principal										1	119	
																		139		

12	DZ	Other Bituminous Surface Texture Defects																		
	DZ1_M	Safety problem exists where loss of skid resistance is evident and or complaint received regarding excessive surface noise	NA	3- safety	1	1	1	Log the defect monitor and inform to principal										1	118	
Defect Category 05 - Other Bituminous Surface																				
13	EA	Loose Stones or Debris on Sealed Roadway																		
	EA1_H	Any verified defect (debris, foreign material, loose stones, litter on roadway) identified by inspections, complaint or notification by Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	130	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	NA	3- safety	5	5	1 week	13	1 week	11	4 week	9	4 week	8	4 week	7		135		

14	EB	Grass on Sealed Roadway																				
	EB1_R	Control of vegetation growth around kerb and channel, along fence lines and on the road pavement that create unsafe road condition	NA	3- safety	5	5	5	3 days	13	3 days	11	2 weeks	9	4 weeks	8	6 weeks	7			407		
	EB2_R	Control of vegetation growth around kerb and channel, along fence lines and on the road pavement	NA	6 - Appearance /Usability	2	2	2	12 months	10	12 months	8	12 months	6	12 months	5	12 months	4			135		
15	ED	Dead Animals on Roadway																				
	ED1_H	Dead animals on roadway that are hazardous	NA	1 - Hazard	10	10	20	As a hazard										20			429	See Hazard procedure
	ED2_R	Dead animals on roadway	NA	3 - Safety	5	5	5	1 day	13	1 week	11	1 week	9	4 weeks	8	4 weeks	7					
16	EE	Rough Manhole Covers and Grates (Rough Service access facility)																				
	EE1_H	Any verified defect (tolerance relative to surrounding ground etc.) identified by inspection, complaint or notification by Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20			139	See Hazard procedure

	EE2_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					
	EE2_R	Height or depth relative to surrounding ground exceeds the upper intervention level in EE2_I	Upper IL	3 - Safety	5	5	4 week	13	4 week	11	6 weeks	9	8 weeks	8	8 weeks	7					
17	RV	Debris on Sealed Shoulders																			
	RV1_H	Any verified defect (debris / foreign material / litter on sealed surface) identified by inspection, complaint or notification by Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	135	See Hazard procedure	
	RV2_M	Any verified defect (debris / foreign material / litter on sealed surface) identified by inspection, complaint or notification by Principal that is unsafe	NA	3 - Safety	1	1	Log the defect monitor and inform to Principal										1	423			
18	ZB	Depressions Service Reinstatement (Rough Service Trench Reinstatement)																			
	ZB1_H	Any verified defect identified by inspection, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	110	See Hazard procedure	
	ZB2_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		112			

	ZB2_R	Depth of depression using a 1.2 m straight edge exceeds <i>the upper intervention level in ZB2_I</i>	Upper IL	3 - Safety	4		4	24 hours	12	1 week	10	2 weeks	8	3 weeks	7	4 weeks	6		430		
Defect Category 06 - Unsealed Shoulder Defects																					
19	GA	Insufficient (Adverse) Crossfall in Unsealed Shoulder																			
	GA1_H	Any verified defect identified by inspection, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10		10	20	NA	As a hazard							20		215	See Hazard procedure	
	GA2_I	Area of ponding of water (not free draining) in the wheel path exceeds 3 m ² : (free draining means water disperses without action of traffic	3 m ²	3 - Safety	2			2	NA	N/A	10 m ²	8	15 m ²	6	20 m ²	5	20 m ²	4		221	
	GA2_R	Area of ponding of water (not free draining) in the wheel path exceeds <i>the upper intervention level in GA2_I</i> : (free draining means water disperses without action of traffic	Upper IL	3 - Safety	3			3	NA	N/A	2 months	9	3 months	7	4 months	6	6 months	5		216	
	GA3_M	The defect causing water ponding on pavement edge or on shoulder	NA	5 - Preventative	1			1	Log the defect and monitor if plan dimension exceeds 1 m2							1		217	218	219	229

20	GB	Excessive Crossfall in Unsealed Shoulder																		
	GB1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is likely to become hazardous	NA	1 - Hazard	10	10	20	NA	As a hazard										20	See Hazard procedure
	GB2_I	Pavement without superelevation: the crossfall of shoulders is less than 6%	6%	5 - Preventative	1		1	NA	N/A	10%	7	10%	5	10%	4	10%	3		215	
	GB3_I	Pavement with superelevation: low side of pavements : the crossfall of shoulders is less than 6%	6%	5 - Preventative	1		1	NA	N/A	10%	7	10%	5	10%	4	10%	3		221 222 216	
	GB4_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	NA	N/A	7%	7	7%	5	7%	4	7%	3		217 218 219	
	GB5_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	NA	N/A	-5%	7	-5%	5	-5%	4	-5%	3		229	

21	GC	Lateral Scour Channels in Unsealed Shoulders																				
	GC1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is likely to become hazardous	NA	1 - Hazard	10	10	20	NA	As a hazard										20		See Hazard procedure	
	GC2_I	Where the seal width is less than 6, the depth exceeds 40 mm	40 mm	3 - Safety	3		3	NA	N/A	NA	N/A	100 mm	7	125 mm	6	125 mm	5		215			
	GC2_R	Where the seal width is less than 6, the depth exceeds the upper intervention level in GC2_I	Upper IL	3 - Safety	4		4	NA	N/A	NA	N/A	6 weeks	8	2 months	7	3 months	6		221			
	GC3_M	Where the seal width is less than 6, the depth is less than 40 mm	40 mm	5 - Preventative	2		2	Log the defect and monitor if depth exceeds 20 mm										2				
	GC4_I	Where the seal width is 6 -8 m, the depth exceeds 40 mm	40 mm	5 - Preventative	2		2	NA	N/A	75 mm	8	100 mm	6	125 mm	5	150 mm	4		216			
	GC5_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										2				
22	GE	Hazardous Dry Loose Material in Unsealed Shoulders																				
	GE1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	NA	N/A	As a hazard										20	215 221 222	See Hazard procedure

	GE2_I	Loose shoulder material depth exceeds 40 mm	40 mm	3 - Safety	2		2	NA	N/A	75 mm	8	75 mm	6	100 mm	5	125 mm	4		216		
	GE2_R	Loose shoulder material depth exceeds the upper intervention level in GE2_I	Upper IL	3 - Safety	3		3	NA	N/A	4 week	9	4 weeks	7	2 months	6	3 months	5		217		
																			218		
																			219		
																			229		
23	GH	Ruts in Unsealed Shoulders																			
	GH1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is likely to become hazardous	NA	1 - Hazard	10		10	20	NA	N/A	As a hazard							20		215	See Hazard procedure
	GH2_I	Where the seal width is less than 6, the depth exceeds 75 mm	75 mm	3 - Safety	2		2	NA	N/A	NA	N/A	100 mm	6	150 mm	5	200 mm	4		221		
																			222		
																			216		
	GH2_R	Where the seal width is less than 6, the depth exceeds upper intervention level in GH2_I	Upper IL	3 - Safety	4		4	NA	N/A	NA	N/A	6 weeks	8	2 months	7	3 months	6		217		
																			218		
	GH3_M	Where the seal width is less than 6, the depth is less than 75	75 mm	5 - Preventative	2		2	Log the defect and monitor if depth exceeds 50 mm									2		219		
																			229		
	GH4_I	Where the seal width is 6 -8 m, the depth exceeds 75 mm	75 mm	5 - Preventative	1		1	NA	N/A	75 mm	7	150 mm	5	200 mm	4	250 mm	3				

	GH5_M	Where the seal width is greater than 8 m, the depth exceeds 100 mm	100m m	5 - Prevent ative	1		1	Log the defect and monitor if depth exceeds 50 mm										1		
24	GG	Debris on Unsealed Shoulder																		
	GG1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	NA	N/A	As a hazard							20	215 221	See Hazard procedure	
	GG2_I	Any debris on shoulder exceeds 40 mm in height	40 mm	3 - Safety	2		2	NA	N/A	75 mm	8	75 mm	6	100 mm	5	125 mm	4	222		
	GG2_R	Any debris on shoulder exceeds upper intervention level in GG2_I	Upper IL	3 - Safety	3		3	NA	N/A	4 weeks	9	4 weeks	7	2 months	6	3 months	5	216 217 218 219 229 230 231 130 135		

25	GK	Reduced Shoulder Width in Unsealed Shoulders																							
	GK1_I	Reduction of shoulder design width in general vicinity exceeds 20%	20%	5 - Preventative	2		2	NA	N/A	30%	8	30%	6	30%	5	30%	4	215							
																					221				
																						222			
																							216		
																							217		
																								218	
																								219	
																									229
																									230
																									231
26	GL	Potholes in Unsealed Shoulder																							
	GL1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	NA	N/A	As a hazard						20	220	See Hazard procedure							

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

	GL2_I	Depth of isolated holes exceeds 60 mm in 2 meters	60 mm	3- Safety	2		2	NA	N/A	100 mm	8	125 mm	6	150 mm	5	150 mm	4																									
	GL2_R	Depth of isolated holes exceeds upper intervention level in GL2_I	Upper IL	3- Safety	3		3	NA	N/A	4 weeks	9	4 weeks	7	2 months	6	3 months	5																									
27	GZ	Shoulder Defects, General																																								
	GZ1_P	Any shoulder defects likely to creates unsafe road condition to travelling public or accelerates shoulder deterioration	NA	2 - Order works	9	9	18	As advised by Principal										18	215	221	222	216	217	218	219	229	230	231	169													

Defect Category 07 - Unsealed Roadway Defects

Defect Category 07 - Unsealed Roadway Defects																									
28	HD	Wheel Ruts in Unsealed Roadways																							
	HD1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	NA	N/A	As a hazard							20	204	201	See Hazard procedure					
	HD2_W	Depth of wheel ruts and shoves using a 1.2 m straight edge (measured valley to crest in case of shoves and ruts) exceeds 80 mm	80mm	5 - Preventative	4	4	4	NA	N/A	NA	N/A	as a part of programmed works*							4	206	203	202	208	207	214
29	HE	Shoving in Unsealed Roadways																							
	HE1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	NA	N/A	As a hazard							20	204	201	See Hazard procedure					
	HE2_W	Depth of wheel ruts and shoves using a 1.2 m straight edge (measured valley to crest in case of shoves and ruts) exceeds 80 mm	80mm	5 - Preventative	4	4	4	NA	N/A	NA	N/A	as a part of programmed works*							4	206	203	202	208		

																				207 214	
30	HM	Potholes in Unsealed Roadways																			
	HM1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	NA	N/A	NA	N/A	As a hazard						20	204 201 206	See Hazard procedure	
	HM2_W	Any potholes	NA	5 - Preventative	3		3	NA	N/A	NA	N/A	as a part of programmed works*						3	203 202 208 207 214		
31	HF	Insufficient Crossfall in Unsealed Roadways																			
	HF1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	NA	N/A	NA	N/A	As a hazard						20	204 201 205 203	See Hazard procedure	
	HF2_W	Any insufficient crossfall	NA	5 - Preventative	1		1	NA	N/A	NA	N/A	as a part of programmed works*						1	202 208		

32	HG	Excessive Crossfall in Unsealed Roadways																	
	HG1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	NA	N/A	NA	N/A	As a hazard					20	204 201 205 203	See Hazard procedure
	HG2_W	Any excessive crossfall	NA	5 - Preventative	1		1	NA	N/A	NA	N/A	as a part of programmed works*					1	202 208	
33	HP	Loss of Pavement Running Course																	
	HP1_W	Any loss of pavement running course	NA	5 - Preventative	1		1	NA	N/A	NA	N/A	as a part of programmed works*					1	205 g	
34	HN	Insufficient Formation Height Above Natural Surface																	
	HN1_H	Water ponds or Possibility of creating Water ponds on the roadway that cannot be drained off naturally	NA	1 - Hazard	10	10	20	As a hazard					20	205	See Hazard procedure				
	HN2_P	Loss of formation shape	NA	2 - Ordered work	9	9	18	NA	N/A	NA	N/A	As advised by Principal					18		

35	HZ	Unsealed roadway defects, general (such as wind rows of material, scour channels, corrugations, soft slippery areas, course surface texture, loose material, roughness)																	
	HZ1_H	Any isolated defects identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	NA	N/A	NA	N/A	As a hazard					20	204 201 205 206	See Hazard procedure
	HZ2_M	Any other unsealed road defects unsafe for road user	NA	3 - Safety	3		3	NA	N/A	NA	N/A	Log the defect monitor and inform to principal					3	203 202 208 207 214	
Defect Category 08 - Surface Drain Defects																			
36	KZ	Surface Drain Defects																	
	KZ1_H	Blocked surface drain cause flooding to the roadway is identified by inspection, complaint or notification by the Principal that is hazardous	NA	1- Hazard	10	10	20	As a hazard					20	301 305	See Hazard Procedure				
	KZ2_P	Blocked surface drain cause flooding to the private property	NA	2 - Ordered work	9	9	18	As advised by Principal					18	302 303 304					
	KZ3_M	Blocked surface drain increase shoulder/pavement deterioration	NA	5 - Preventative	1		1	log the defect and monitor drainage performance					1	319 429					

	KZ4_M	Scouring of drains	NA	5 - Preventative	1	1	log the defect and monitor drainage performance										1			
Defect Category 09 - Concrete Roadway, Culvert, Pipe, Pit & Floodway Defects																				
37	LA	Drainage Obstructed																		
	LA1_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	NA	1 - Hazard	10	10	20	As a hazard										20	301 305 302	See Hazard Procedure
	LA2_P	Any drainage obstruction endangering private property	NA	2 - Order works	9	9	18	As advised by Principal										18	303 304	
	LA3_I	Amount of waterway area obstructed exceeds 20 %	20%	5 - Preventative	1	1	30%	9	30%	7	50%	5	50%	4	50%	3	319 341			
38	LP	Silt or Debris on Floodway Sections																		
	LP1_H	Any silt or debris encroaching into floodway sections of roadway identified by inspections, complaint that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	340	See Hazard Procedure

39	LZ	Culvert, Pipe, Pit & Floodway Defects, Other									
	LZ1_H	Damaged or missing drainage pit lids, surrounds, grates, in pedestrian areas or traffic lanes	NA	1- Hazard	10	10	20	As a hazard	20		See Hazard Procedure
	LZ2_M	Cracking > 5 mm in culvert components or visible movement	5mm	3 - Safety	4		4	Log the defect monitor and inform to principal	4		
	LZ3_M	Misalignment/ separation of culvert components > 20 mm incl head wall separation	20mm	3 - Safety	4		4	Log the defect monitor and inform to principal	4	320	
	LZ4_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	4	322 323 324 325 327	
	LZ5_M	possibility of reduction of structural integrity due to spalling over the concrete surface	NA	3 - Safety	4		4	Log the defect monitor and inform to principal	4	321 328 329 341 342	
	LZ6_M	Cracking in end structures (less than 5mm wide and no forward movement)	NA	5 - Preventative	1		1	Log the defect monitor and inform to principal	1	349 319	
	LZ7_M	Misalignment/ separation of culvert components < 20 mm incl head wall separation	visible separation	5 - Preventative	1		1	Log the defect monitor and inform to principal	1		
	LZ8_M	Culvert or end structure silted up	NA	5 - Preventative	1		1	Log the defect monitor and inform to principal	1		

	LZ9_M	Scouring around culvert components	NA	5 - Preventative	1	1	Log the defect monitor and inform to principal										1		
40	YA	Cracks in Concrete Roadway (diagonal, block, transverse, corner cracks, longitudinal, meandering and surface cracks)																	
	YA1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is likely to become hazardous	NA	1 - Hazard	10	10	As a hazard										20	124	See Hazard Procedure
	YA2_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		125	
41	YB	Spalling of Joints - Concrete Pavement																	
	YB1_H	Evidence of spalling of concrete occurring adjacent to slab joints that is hazardous	NA	1 - Hazard	10	10	As a hazard										20		See Hazard Procedure
	YB2_R	When the 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		124	
	YB3_P	Any spalling in wheel path attracts complaints due to unacceptable ride quality	NA	2 - Order works	9	9	As advised by Principal										18		

42	YC	Joint Sealant Defects in Concrete Pavement																		
	YC1_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	
43	YD	Potholes in Concrete Pavement																		
	YD1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20		See Hazard Procedure
	YD2_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				
	YD2_R	Plan dimension on sealed pavements exceeds the upper intervention level in YD2_I	Upper IL	3 - Safety	5	5	24 hours	13	1 week	11	2 weeks	9	3 weeks	8	4 weeks	7			127	
	YD3_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												129	
	YD4_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				
	YD4_R	Depth on sealed pavements exceeds the upper intervention level in YD4_I	Upper IL	3 - Safety	5	5	24 hours	13	1 week	11	2 weeks	9	3 weeks	8	4 weeks	7				

	YD5_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										1			
	YD6_P	Any pothole in the wearing surface that results in the loss of material under traffic	NA	2 - Ordered work	9	9	18	As advised by Principal										18		
44	YE	Sunken Concrete Pavement Slab (Stepping)																		
	YE1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	128	See Hazard Procedure
	YE2_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				
Defect Category 10- Subsoil Drain Defects																				
45	MZ	Subsoil Drain Defects																		
	MZ1_M	Any non functional or missing or decayed element of the subsoil drainage system including flush points and outlets cause reducing flow capacity or sub soil drainage integrity	NA	5 - Preventative	1	1	Log the defect monitor and inform to principal										1	330 331 332 339 329		
Defect Category 11- Roadside Vegetation Defects																				

46	NC	Grass not in sight line																		
	NC1_P	Excessive Roadside Vegetation in rural area to control fire hazard or drainage, applies to designated areas only	NA	2 - Ordered work	9	9	18	As advised by Principal										18	401 408 402 403 415	discuss with element leader
47	NE	Large Trees and Shrubs Close to Roadway (in consultation with environmental management staff)																		
	NE1_H	Large trees close to roadway which are considered to be a hazard	NA	1 - Hazard	10	10	20	As a hazard										20		See Hazard Procedure
	NE2_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	9	9	18	As advised by Principal										18	405 419	
	NE3_P	Other: Previously cleared area where regrowth is evident	NA	2 - Ordered work	9	9	18	As advised by Principal										18		

48	NF	Declared Plants																		
	NF1_P	Remove Noxious weeds and environmental weeds before they flower	NA	4- Legislative	1	10	20	As advised by Principal										1	407 406 460 405	discuss with element leader
49	NG	Trees or Limbs Likely to Fall on Roadway																		
	NG1_H	Trees, overhanging branches or broken limbs most likely to fall on roadway to be a hazard	NA	1 - Hazard	10	10	20	As a hazard										20		See Hazard Procedure
	NG2_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	10	20	2 weeks	12	1 month	10	1 month	8	2 months	7	3 months	6		405	
50	NH	Grass, Trees and Shrubs in Sight Line, in Drain or Obstructing Roadside Furniture																		
	NH1_H	Any vegetation obscure sight distance, minimum stopping distance that is hazard	NA	1 - Hazard	10	10	20	As a hazard										20	401	See Hazard Procedure

	NH2_R	Any vegetation obscure sight distance and minimum stopping sight distance	NA	3 - Safety	4	4	2 weeks	12	1 month	10	1 month	8	2 months	7	3 months	6		407	
	NH3_R	Vegetation obscures sight lines of accesses or intersections or sight distances of previously cleared areas or any signs or guide posts	NA	3 - Safety	4	4	2 weeks	12	1 month	10	1 month	8	2 months	7	3 months	6		405	
	NH4_R	Any vegetation within 3.6 m of edge of roadway exceeds 500 mm on national highways and 700 mm in 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		408	
																		403	
																		319	
																		404	
51	NK	Landscaping Defects																	
	NK1_M	50% loss of asset	NA	6- Appearance /Usability	1	1	Log the defect monitor and inform to principal										1	409	
																		411	
																		412	
																		419	
																		410	
																		401	
																		403	

52	NL	Grass Growth on Medians																			
	NL1_I	Grass in urban areas	NA	6- Appeara nce /Usabilit y	1	1	200 mm	9	200 mm	7	200 mm	5	200 mm	4	200 mm	3					
	NL1_R	Urban areas growth exceeds 200mm in height	200 mm	6- Appeara nce /Usabilit y	1	1	1 month s	9	1 Month	7	1 Month	5	2 Months	4	2 Months	3					
	NL2_I	Grass in rural Areas	NA	6- Appeara nce /Usabilit y	1	1	500 mm	9	500 mm	7	500 mm	5	500 mm	4	500 mm	3					
	NL2_U	Rural Areas growth exceeds 500 mm in height	500 mm	6- Appeara nce /Usabilit y	1	1	1 Month	9	2 Months	7	2 Months	5	3 Months	4	3 Months	3					
Defect Category 12- Rest Area Defects																					
53	PB	Dead Trees or Limbs in Rest Area																			
	PB1_H	Trees, overhanging branches or broken limbs most likely to fall on rest areas	NA	1 - Hazard	10	10	20	As a hazard											20	405 440	See Hazard Procedure

54	PC	Routine amenity servicing																		
	PC1_R	Any verified defect identified by inspection, complaint, or notification by principal that renders the facility unusable	NA	Special	3		3	24 hrs	11	24 hrs	9	twice a week	7	weekly	6	Twice a month	5		440	
	PC2_P	Routine amenity services	NA	2 - Ordered work	9	9	18	As advised by Principal										18		
55	PA	Litter, Below Standard Amenity Furniture in Rest Area																		
	PA1_R	Litter bins collection	NA	Special	2		2	24 hrs	10	24 hrs	8	weekly	6	weekly	5	Twice a month	4		440	
56	PZ	Rest Area Defects Other																		
	PZ1_P	Rest area building maintenance (painting, plumbing, roofing etc.)	NA	2 - Ordered work	9	9	18	As advised by Principal										18	440	
	PZ2_R	Height of vegetation 200mm	200 mm	3 - Safety	1		1	1 month	9	1 month	7	1 month	5	1 month	4	6 weeks	3		441	
	PZ3_R	Any pavement related defects	NA	3 - Safety	1		1	1 month	9	2 months	7	3 months	5	4 months	4	4 months	3		449	
																			405	

Defect Category 13- Other Roadside Defects																						
57	RA	Unauthorised Signs																				
	RA1_P	Any verified unauthorized sign identified by inspection, complaint or notification by principal	NA	2 - Ordered work	9	9	18	As advised by Principal										18	424			
58	RB	Unstable Batter/ Embankment, Missing Material																				
	RB1_P	Unstable cut/ embankment to be filled to manage scour, cracks, erosion or instability	NA	2 - Ordered work	9	9	18	As advised by Principal										18	426	427	339	875
59	RC	Damaged Concrete or Paving Blocks																				
	RC1_H	Damaged, displaced concrete or paving blocks in pedestrian areas, identified by complaint, inspection or notification by the principal that is hazardous	NA	1- Hazard	10	10	20	As a hazard										20			refer to defect 45(YE) in new standards	
	RC2_R	Damaged, displaced concrete or paving blocks in pedestrian areas potential unsafe situation to pedestrian	NA	3 - Safety	4	4	1 week	12	1 week	10	2 weeks	8	2 weeks	7	2 weeks	6		306	429			
	RC3_R	Damaged, displaced concrete or paving blocks potential unsafe situation to travelling public	NA	3 - Safety	2	2	2 weeks	10	2 weeks	8	4 weeks	6	4 weeks	5	6 weeks	4						

60	RD	Loose earth, Rock in Sight Line																	
	RD1_R	Earth, rock and loose material in sight line	NA	3 - Safety	4		0	1week	8	1week	6	2 weeks	4	2 weeks	3	2 weeks	2		425 429
61	RE	Litter on Road Reserve																	
	RE1_H	Any verified litter(dumped tyres, oil waste etc.) on road reserve identified by inspection, complaint, or notification by principal that deemed a health hazard	NA	1- Hazard	10	10	20	As a hazard										20	420 421
	RE2_P	Offensive litter on road reserve	NA	2 - Ordered work	9	9	18	As advised by Principal										18	429 440
	RE3_M	Litter on environmentally sensitive locations	NA	4- Legislative	1		1	Log the defect monitor and inform to principal										1	
62	RF	Graffiti																	
	RF1_P	Any graffiti considered offensive and highly visible to public	NA	2 - Ordered work	9	9	18	As advised by Principal										18	422
	RF2_R	Road user safety compromised by the graffiti	NA	3 - Safety	3		3	1 day	11	1 days	9	1 day	7	2 weeks	6	4 weeks	5		

	RF3_R	Any other graffiti	NA	6- Appearance /Usability	1		1	1 week	9	2 weeks	7	4 weeks	5	6 weeks	4	8 weeks	3			
63	RG	Scoured Areas on the Road Reserve																		
	RG1_H	Scour is likely to affect the structural capacity of the roadway	NA	1- Hazard	10	10	20	As a hazard										20	880	
	RG2_P	Any scour is likely to cause environmental damage or likely to affect adjoining private property	NA	2 - Ordered work	9	9	18	As advised by Principal										18	310	
64	RH	Abandoned Vehicles																		
	RH1_H	Any abandoned vehicle or equipment likely to be hazardous to travelling public or pedestrians	NA	1- Hazard	10	10	20	As a hazard										20	429	
	RH2_P	Any other abandoned vehicle or equipment in road reserve.	NA	2 - Ordered work	9	9	18	As advised by Principal										18	418	
65	RK	Illegal Accesses																		
	RK1_P	Any illegal accesses to TMR road network	NA	2 - Ordered work	9	9	18	As advised by Principal										18	429	

66	RL	Illegal Turning Areas																		
	RL1_P	Any illegal turning Areas within TMR road network	NA	2 - Ordered work	9	9	18	As advised by Principal										18	429	439
67	RM	Landscape Vegetation Defects																		
	RM1_M	Landscape Vegetation in any visually sensitive locations is likely to compromise road user safety	NA	3 - Safety	1		1	Log the defect monitor and inform to principal										1		
	RM2_M	Landscape Vegetation in any visually sensitive locations	NA	6- Appearance /Usability	1		1	Log the defect monitor and inform to principal										1	429	
68	RN	Damaged Qld Dept. of Main Roads Fencing																		
	RN1_H	Fence damage that is a hazard	NA	1- Hazard	10	10	20	As a hazard										20		
	RN2_M	Damage affecting effectiveness or purpose of the fence	NA	3 - Safety	3		3	Log the defect monitor and inform to principal										3	880	
	RN3_M	Poor aesthetics to travelling public or pedestrians	NA	6- Appearance /Usability	1		1	Log the defect monitor and inform to principal										1	429	

69	RP	Damaged Qld Dept. of Main Roads Noise Barrier Fencing																			
	RP1_P	One panel is missing or damage	NA	2 - Ordered work	9	9	18	As advised by Principal											18	870	
70	RR	Damaged or Unserviceable Bus Shelters																			
	RR1_M	Damaged or Unserviceable Bus Shelters likely to compromise public safety	NA	3 - Safety	1		1	Log the defect monitor and inform to principal											1	890 891	
71	RT	Sediment Pond Defects General																			
	RT1_P	Silted or Unserviceable Sedimentation Pond Facilities	NA	2 - Ordered work	9	9	18	As advised by Principal											18	312	
	RT2_M	Any defect likely to affect the proper functioning of the asset	NA	5 - Prevent ative	1		1	Log the defect monitor and inform to principal											1	313	
72	RW	Damaged Roadside Weighing Area																			
	RW1_P	Facility is not functional	NA	2 - Ordered work	9	9	18	As advised by Principal											18	429	

Defect Category 14 - Traffic Sign Defects

Defect Category 14 - Traffic Sign Defects																		
73	SA	Missing, Damaged or Dirty Regulatory, Warning or Hazard Sign																
	SA1_H	Any sign or footing damage (including sign being unstable) that is hazard	NA	1 - Hazard	10	10	20	As a hazard								20	TBA	
	SA2_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 secs of travel at the operational speed in urban areas)	NA	3- Safety	5		5	1 day	13	1 day	11	1 day	9	1 day	8	1 day	7	501
	SA3_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 secs of travel at the operational speed in urban areas)	NA	3- Safety	3		3	2 months	11	3 months	9	3 months	7	3 months	6	3 months	5	502 503 504 509

	SA4_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 secs of travel at the operational speed in urban areas)	NA	3- Safety	4	4	2 months	12	3 months	10	3 months	8	3 months	7	3 months	6						
74	SB	Missing or Defective Guide Sign																				
	SB1_H	Any verified defect on sign or support identified by inspection, complaint, or notification by principal that is likely to become hazardous to public	NA	1- Hazard	10	10	20	As a hazard										20	504			
	SB2_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 secs of travel at the operational speed in urban areas) is likely to create unsafe road environment to travelling public	NA	3 - Safety	2	2	1 week	10	1 week	8	2 weeks	6	3 weeks	5	4 weeks	4		506	505	509	507	512

75	SC	Sign Misalignment																			
	SC1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard											20	509 502 503 559	See Hazard Procedure
	SC2_R	Sign is reflecting glare from vehicles lights at night back to the motorist	NA	3- Safety	2		2	2 months	10	3 months	8	3 months	6	3 months	5	3 months	4				
	SC3_R	Sign is on a noticeable lean (greater than 15 degrees)	15°	3- Safety	1		1	2 months	9	3 months	7	3 months	5	3 months	4	3 months	3				
	SC4_R	Fix sign inclined to line of sight (twisted) by more than 30 degrees)	30°	3- Safety	2		2	2 months	10	3 months	8	3 months	6	3 months	5	3 months	4				
Defect Category 15- Traffic Furniture Defects																					

76	TA	Guide Post or Delineator Defects																										
	TA1_H	Any verified defect identified by inspections, complaint or notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20	525									
	TA2_R	Any missing guide posts in a hazardous location for the travelling public <u>or</u> the post is on a noticeable lean <u>or</u> there is an inability at night to see at least two delineators ahead (both red, both white, or red and white) from a guide post location <u>or</u> any missing delineators on guardrail installation. (Above relates to observation after cleaning the post and delineator, on low beam)	NA	3 - Safety	3	3	1 month	11	1 month	9	1 month	7	1 month	6	1 month	5		510										
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77	TC	Guardrail, Fencing and Concrete Barrier Structural Defects																										
	TC1_H	Damaged guardrail <u>or</u> components (e.g. terminal sections) are a potential hazard to traffic	NA	1 - Hazard	10	10	20	As a hazard										20	522									
																						523						
																							524					
	TC2_R	Guardrail, Fencing or Concrete barrier facility has a loss of structural integrity	NA	3 - Safety	5	5	1 week	13	2 week	11	3 weeks	9	2 months	8	3 months	7						530						
																							532					

	TC3_R	Guardrail panel is bent exceed 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		534				
	TC4_P	Aesthetic appearance decreased by accumulation of dirt, peeling paint etc.	NA	2 - Ordered work	9	9	18	As advised by Principal										18	520	531	559	429	525
78	TB	Reference Marker Defects																					
	TB1_R	Reference Marker not visible or missing	NA	6- Appearance /Usability	1		1	3 months	9	3 months	7	4 months	5	6 months	4	6 months	3		512				
	TB2_R	Illegible when viewed from vehicle travelling at 80km/hr	NA	6- Appearance /Usability	1		1	3 months	9	3 months	7	4 months	5	6 months	4	6 months	3						
79	TD	Kerb or Dyke Defects																					
	TD1_H	Any verified defect identified by inspection, complaint, or notification by principal that likely to cause accidents	NA	1- Hazard	10	10	20	As a hazard										20	306	429			

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

	TD2_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	NA	0				
	TD2_R	Damaged, misaligned kerbing or median noses exceeds the upper intervention level in TD2_I that interrupted longitudinal drainage flow, tripping hazards.	Upper IL	3 - Safety	3	3	1week	11	1week	9	2 Weeks	7	4 Weeks	6	NA	0				
	TD3_M	Continuous kerbing damaged or missing	NA	6- Appearance /Usability	2	2	Log the defect monitor and inform to principal										2			
80	TE	Guardrail, Fencing and Concrete Barrier Appearance Defects																		
	TE1_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 notify by principal that likely to cause accidents	NA	1- Hazard	10	10	20	As a hazard										20	521 522 559	see defect no 42

Defect Category 16 - Traffic Marking Defects

Defect Category 16 - Traffic Marking Defects																			
81	UA	Missing or Faded Painted Road Lines and Markings																	
	UA1_M	Any verified defect identified by inspections, complaint or notification by the Principal that is unsafe	NA	3 - Safety	4		4	Log the defect monitor and inform to principal									4	701 702 703 704 705 709 707 710 711 712 713 714 719 720 721 722 723 724 725 729 730 731	See Hazard Procedure

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82	UE	Raised Pavement Marker Defects																	
	UE1_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										4	740 429 559	
Defect Category 17 - Traffic Signal Defects																			
83	VA	Traffic Signal Controller Defects																	
	VA1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: (I) Flashing Yellow (II) Site blacked out (III) Confusing signal displays (IV) Controller knocked down (V) Stuck in phase/ not cycling (VI) Safety critical times too short (VII) Skipping phase, not serving vehicle or pedestrian demands (VIII) Train (Heavy Rail) interface not operating correctly (IX) Tram (Light Rail) interface not operating correctly	NA	1 - Hazard			4 hours											650	

		(X) Two lamps out or more per signal group failure								
84	VA2_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: (I) Twisted & non conflicting lantern arrangement; (II) Lamps out (other than pedestrian "Don't Walk" lamps); (III) Visors or louvres missing or damaged; (IV) Lenses damaged; (V) Missing/defaced labeling.	NA	2 - Ordered work				2 business days		650 602 619 610 950

	VA3_R	(1) Detector failures causing phases to be called and/or extended unnecessarily (II) Communications failure (III) Timing fault (not safety critical times) (IV) Button failures causing phases to be called and/or extended unnecessarily	NA	3 - Safety				2 business days								650 619	
85	VB	Traffic Signal Lantern Defects															
	VB1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: (I) Flashing Yellow (II) Confusing signal displays (III) Misaligned lantern causing confusing signal displays (IV) Damaged or open door on lantern (V) Damaged lantern or lantern parts at risk of falling	NA	1 - Hazard				4 hours								650	

	VB2_P	(i) Twisted & non Confusing lantern arrangement (ii) Missing or damaged hardware (i.e. missing pole and/or associated hardware) (iii) Lamp outages (iv) Visors, louvers or target boards missing or damaged (v) poor lantern aiming (vi) loss of displays	NA	2 - Ordered work				Missing pole and associated hardware (without footing damage) - 12 Business Days Missing pole and associated hardware (<u>with</u> footing damage) - 16 Business Days Otherwise monthly (Traffic Signal Lamp Failure Program)										650 602 619 610 950	
86	VC	Traffic Signal Electrical Defects																	
	VC1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: (1) Flashing Yellow (II) Damaged or missing finial cap/traffic signal mast arm junction box/ JU pole terminal panel cover/controller cabinet door (III) Hanging or damaged cables (IV) Exposed wires/cables (V) Audio tactile unit fault.	NA	1 - Hazard				4 hours										650	

87	VD	Traffic Signal Hardware Defects														
	VD1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: (I) Confusing signal displays (II) Damaged and dangerous post/pole (including knockdowns) (III) Controller knocked down; (IV) Damaged push button (V) Push button not operating and not placing a demand (VI) Stuck in phase/ not cycling (VII) Skipping phase, not servicing vehicle or pedestrian demands (VIII) Trivision sign fault causing confusion (IX) Audio tactile unit fault.	NA	1 - Hazard				4 hours		650						

	<p>VD2_P</p>	<p>(I) Misaligned & non confusing lantern arrangement (II) Missing or damaged hardware (i.e. missing pole and/or associated hardware). (III) Lamp outages (IV) Visors, louvers or target boards missing or damaged (V) poor lantern aiming (VI) loss of displays (VII) failed inductive loops. (VIII) Finish, controller obviously out of plumb, pole obviously out of plumb, signal hardware out of plumb, Tidiness, Cleanliness, etc.</p>	<p>NA</p>	<p>2 - Ordered works</p>			<p>Missing pole and associated hardware (without footing damage) - 12 Business Days Missing pole and associated hardware (<u>with</u> footing damage) - 16 Business Days Otherwise monthly (Traffic Signal Lamp Failure Program)</p>		<p>650 619 602 610 950</p>	
	<p>VD3_R</p>	<p>(1) Detector failures causing phases to be called and/or extended unnecessarily (II) Communications failure (III) Timing fault (not safety critical times) (IV) Button failures causing phases to be called and/or extended unnecessarily</p>	<p>NA</p>	<p>3 - Safety</p>			<p>2 business days</p>		<p>650 619</p>	
	<p>VD6_P</p>	<p>Any reported defect not impinging the operation of the traffic equipment</p>	<p>NA</p>	<p>6- Appearance /Usability</p>			<p>Monthly (Traffic Signal Lamp Failure Program)</p>		<p>602 610</p>	

88	VE	Traffic Signal Defects other															
	VE1_H	Any reported defect such as given below have potential to cause dangerous or hazardous situation: (I) Vehicle detector on operating and placing a demand (II) Heavy Rail detector locked on or not operating (III) Queue det equipment on ramp metering (on Ramps & Off Ramps (IV) UPS Failure	NA	1 - Hazard								4 hours			650		
	VE2_P	(I) Misaligned & non confusing lantern arrangement (II) Missing or damaged hardware (i.e. missing pole and/or associated hardware). (III) Lamp outages (IV) loss of displays (V) failed inductive loops. (VI) Finish, controller obviously out of plumb, pole obviously out of plumb, signal hardware out of plumb, Tidiness, Cleanliness, etc.	NA	2 - Ordered works											650 602 619 610 950		

	VE3_R	(1) Detector failures causing phases to be called and/or extended unnecessarily (II) Communications failure (III) Timing fault (not safety critical times) (IV) Button failures causing phases to be called and/or extended unnecessarily	NA	3 - Safety				2 business days											650 619	
89	VG	Electrical Cable Pit Defects																		
	VG1_P	Electrical cable pit is not safe for public	NA	2 - Ordered works				Readily accessible by public pedestrians - 4 hours <u>Not</u> readily accessible by public pedestrians (i.e. Motorway, rural road environment) - 5 business days											650 635 640	
	VG2_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").	NA	3 - Safety				18 business days											635 640	
90	VH	Inductive Loop Defects (Not at a traffic signal installation)																		
	VH1_H	Any reported defects where the equipment that is likely to cause personal injury/property damage	NA	1 - Hazard				5 business days		5 business days		2 business days		2 business days		2 business days			621	

	VH2_P	Any reported inductive loop failures	NA	2 - Ordered works				road lighting sites requiring access via low level level traffic - 10 business days road lighting sites requiring access via high level level traffic - 15 business days											621	
91	VJ	Emergency Phone Defects																		
	VJ1_P	Emergency phone site is/has been made safe but is operationally degraded, including but not limited to: (I) Handset off holder; (II) Missing, damaged or faulty hardware;	NA	2 - Ordered works				8 business days											550	
Defect Category 18 - Public Lighting Defects																				
92	QA	Lighting switchboard defects																		
	QA1_H	Complete failure of switchboard resulting in electrical shock risk to people.	NA	1 - Hazard				4 hours											651	
	QA2_H	Switchboard door open or Pillar cover dislodged, visible and easily accessible to public.	NA	1 - Hazard				4 hours											651	
	QA3_R	Any reported lighting circuit, electrical switchboard or consumer mains failure. E.g. loss of circuit due to vermin attack, electrical fault etc. No electrical shock risk to people.	NA	3 - Safety				road lighting sites requiring access via low level level traffic - 5 business days road lighting sites requiring access via high level level traffic - 15 business days											609	
	QA4_R	Switchboard door/ pillar cover insecure/ not locked, potentially accessible to public.	NA	3 - Safety				4 hours											651	

93	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.	NA	1 - Hazard														651 635 640
	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.	NA	1 - Hazard														651
	QB3_H	Luminaire visor/diffuser not secure/hanging. Or light is displaced/ re-aligned 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.	NA	1 - Hazard														651

	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.	NA	3 - Safety				Missing pole and associated hardware (without footing damage) - 10 business days Missing pole and associated hardware (<u>with</u> footing damage) - 15 business days		950	Failure of isolated lighting installations fall under this defect code.
	QB5_R	Road lighting circuit continuously on (i.e. photoelectric (PE) cell failure)	NA	5 - Preventative				5 business days		609	
	QB6_R	Light cycling (intermittent switching on and off)	NA	5 - Preventative				as per public lighting lamp run schedule		603 604	
	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.	NA	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.	NA	5 - Preventative				As advised by Principal		609	
94	QC	Lighting electrical defects									
	QC1_H	Pole or pole hatchway missing, exposing potentially live cables.	NA	1 - Hazard				4 hours		651	

	QC2_H	Exposed cables in pit	NA	1 - Hazard				4 hours									651	
	QC3_R	Road lighting circuit failure (repairs to circuit in field). No electrical shock risk to people.	NA	3 - Safety				road lighting sites requiring access via low level level traffic - 5 business days road lighting sites requiring access via high level level traffic - 15 business days									609	
95	QD	Lighting general defects																
	QD1_H	Failed navigation lights connected to a public lighting switchboard	NA	1 - Hazard				As advised by Principal									603 604 609	
	QD2_R	Miscellaneous e.g. vermin infestation	NA	2 - Ordered works				As advised by Principal									609	
	QD3_R	Vegetation shading road lighting	NA	2 - Ordered works				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).	NA	3 - Safety				as per public lighting lamp run schedule									603 604	
	QD5_R	Any reported graffiti, vandalism, unauthorised banners.	NA	6 - Appearance/ Usability				As advised by Principal									609	

Defect Category 19 - Bridge & Miscellaneous Structure Defects

96	WD	Bridge Defects General- Debris on Bridges																	
	WD1_H	Any debris on overpass that can be used as projectiles that can be hazardous to travelling public or pedestrians	NA	1- Hazard	10	10	20	As a hazard										20	455
	WD2_R	Debris on bridges that is likely to interrupt the drainage facility, operation of expansion joints or affect the usability of the bridge	NA	5 - Preventative	2		2	2 days	10	3 days	8	1 week	6	2 weeks	5	4 weeks	4		455

Defect Category 20 - Emergency

97	ZZ	Emergency Call Out																	
	ZZ1_H	Any reported emergency incidents that likely to create unsafe situation to road users or likely to damage the road asset	NA	1- Hazard	10	10	20	report on site within 1 hr	20	report on site within 1 hr	20	mobilise in 1 hr	20	mobilise in 1 hr	20	mobilise in 1 hr	20		452 860 450 889 455

Defect Category 21 - Bike Path Defects

Defect Category 21 - Bike Path Defects																						
98	JA	Bike path/lanes Surface defects																				
	JA1_H	Any verified defect identified by inspections, complaint, notification by the Principal that is hazardous	NA	1 - Hazard	10	10	20	As a hazard										20				
	JA2_I	Accumulation of loose stones, sand or debris on the bike path exceeds 5mm in depth or area exceeds 1m ²	5 mm	3 - Safety	4	4	4	10 mm	12	10 mm	10	10 mm	8	10 mm	7	10 mm	6		140			
	JA2_R	Accumulation of loose stones, sand or debris on the bike path exceeds the upper intervention level in JA2_I	Upper IL	3 - Safety	5	5	5	3 days	13	3 days	11	3 days	9	3 days	8	3 days	7		151			
	JA3_I	Accumulation of loose stones, sand or debris on the bike path exceeds 5mm in depth or area exceeds 1m ²	1 m ²	3 - Safety	4	4	4	2m ²	4	2m ²	4	2m ²	4	2m ²	4	2m ²	4		152			
	JA3_R	Accumulation of loose stones, sand or debris on the bike path exceeds the upper intervention level in JA3_I	Upper IL	3 - Safety	5	5	5	3 days	5	3 days	5	3 days	5	3 days	5	3 days	5		105			
	JA4_I	Potholes / delamination / isolated slab failure exceeds 10mm in depth	10 mm	3 - Safety	4	4	4	20 mm	12	20 mm	10	20 mm	8	20 mm	7	20 mm	6		107			
	JA4_R	Potholes / delamination / isolated slab failure exceeds the upper intervention level in JA4_I	Upper IL	3 - Safety	5	5	5	3 days	13	3 days	11	3 days	9	3 days	8	3 days	7		142			
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																			157			
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																			143			
																			144			
																			112			
																			141			

	JA5_I	Shoving, depressions, rutting, lumps or ridges exceeds 20mm in 1.2m straight edge	20 mm	3 - Safety	4	4	4	30 mm	12	30 mm	10	30 mm	8	30 mm	7	30 mm	6					
	JA5_R	Shoving, depressions, rutting, lumps or ridges exceeds the upper intervention level in <i>JA5_I</i>	Upper IL	3 - Safety	5	5	5	3 days	13	3 days	11	3 days	9	3 days	8	3 days	7					
99	JB	Vegetation defects - Bike paths																				
	JB1_H	Trees, overhanging branches or broken limbs most likely to fall on bike path to be a hazard	NA	1 - Hazard	10	10	20	As a hazard										20				
	JB2_P	Previously cleared area where regrowth is evident	NA	2- Ordered works	9	9	18	As advised by Principal										18				
	JB3_R	Unwanted trees and shrubs or grass obscures in sightlines	NA	3 - Safety	2	2	2	2 weeks	10	2 weeks	8	2 weeks	6	2 weeks	5	2 weeks	4					
	JB4_M	Trees or limbs likely to fall on bike path	NA	3 - Safety	3	3	3	Log the defect and monitor if it become critical										3				
100	JC	Drainage defects - Bike paths																				
	JC1_I	Obstructed drainage cause water ponding on bike path exceeds 1m ² or private property is endangered.	1 m ²	3 - Safety	3	3	3	2m ²	11	2m ²	9	2m ²	7	2m ²	6	2 m ²	5					
	JC1_R	Obstructed drainage cause water ponding on bike path exceeds the upper intervention level in <i>JC1_I</i>	Upper IL	3 - Safety	3	3	3	2 days	11	2 days	9	2 days	7	2 days	6	2 days	5					

	JC2_R	Obstructed drainage cause water ponding adjacent to bike path	NA	5 - Preventative	1	1	2 weeks	9	2 weeks	7	2 weeks	5	2 weeks	4	2 weeks	3			
	JC3_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			
	JC3_R	Blocked drainage, culverts or pipes exceeds the upper intervention level in <i>JC3_I</i>	Upper IL	5 - Preventative	1	1	2 weeks	9	2 weeks	7	2 weeks	5	2 weeks	4	2 weeks	3			
	JC4_R	Culverts, pipes and pits defects likely to impact on the integrity of the unit	NA	5 - Preventative	1	1	4 weeks	9	4 weeks	7	4 weeks	5	4 weeks	4	4 weeks	3			
101	JD	Bike path Defects General																	
	JD1_R	Damaged bike path fencing creates unsafe riding environment to cyclists	NA	3 - Safety	1	1	2 days	9	2 days	7	2 days	5	2 days	4	2 days	3			880
	JD2_R	Missing or defective regulatory or warning sign	NA	3 - Safety	1	1	2days	9	2 days	7	2 days	5	2 days	4	2 days	3			504
	JD3_R	Missing or defective guide sign	NA	6 - Appearance/ Usability	1	1	2 weeks	9	2 weeks	7	2 weeks	5	2 weeks	4	2 weeks	3			502
																			506
																			505
																			509

Defect Category 22 - Common Defects

102	XA	Inspection Needed																							
	XA1_P	Additional inspection needed by complaints, specific reason or incidents	NA	2 - Ordered work	9	9	18	As advised by Principal										18	901 RM PC Joint Main tena nce Req uire men ts Ass ess men t 322						
Note 1: Priority group definition: 1 Hazard, 2 Ordered work, 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

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

The defect is in the monitoring stage - 1

Note 9: Response time starts when the defect has reached to 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 and so on) defects. Maintenance Activity Payment Types (Section 5.2) and Maintenance Activity Standards (Section 5.3) provide in-depth knowledge to use maintenance activities. Contractors may use alternative cost effective maintenance activity standards that suits 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 Descriptions - Summary

100 SEALED SURFACES

101 Edge Repair (Manual)

The manual repair with asphalt or premix, of isolated lengths of sealed pavement to restore the edges to line and level. Includes surface preparation and tack coating and the placing of shoulder material against the repair and compaction.

102 Edge Repairs (Mechanical)

The machine repair with asphalt or premix of sealed pavement edges to line and level. Includes surface preparation and tack coating.

103 Edge Repair with Emulsion/Aggregate

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

105 Pothole Patching

The repair with asphalt or premix of an isolated hole or series of holes in the roadway surface due to loss of material including:

- the removal of any cracked or loose material
- forming a vertical face at least 25 mm deep, on the hole edges, and
- surface preparation and tack coating.

106 Pothole Patching with Emulsion/Aggregate

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

107 Heavy Patching

The repair with asphalt or premix of any hole or series of holes on the roadway surface which results in a total patched area greater than 10 m². Repair includes:

- the removal of any cracked or loose material
- forming a vertical face at least 25 mm deep, on the hole edges, and
- surface preparation and tack coating.

110 Surface Correction with Premix/Asphalt (Manual)

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

111 Surface Correction with Premix/Asphalt (Mechanical)

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

112 Surface Correction with Emulsion/Aggregate

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

115 Surface Enrichment

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

116 Slurry Seal

The application of a slurry of polymer-modified bitumen emulsion and aggregate to an existing bituminous surface.

117 Reseal

The mechanical surface treatment of the existing roadway surface to seal the surface and restore surface life and/or skid resistance.

118 Seal Coating (Minor)

The surface treatment of short sections of existing roadway surface by resealing to seal the surface and restore surface life and/or skid resistance. Includes the supply of all materials and the protection of service box lids.

120 Fill Cracks

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

121 Crack Treatment with Emulsion/Aggregate

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

122 Treat with Strain Alleviating Product

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

123 Surface Strip Treatment of Cracks

The cleaning and filling of cracks wider than 20 mm in bituminous pavements and sealing with a surface strip treatment, such as:

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

124 Concrete Joint and Crack Treatment

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

125 Stitch Treat Cracks in Concrete Roadways

The stitching of cracks on concrete roadway surface using staple tie bars. Includes the provision of cleaned out chase out slots, appropriate resin mortar and a sealed crack groove.

126 Replacement of concrete joint sealant

Includes all activities in relation to the replacement of concrete joint sealant in concrete pavements

127 Concrete Pothole patching

Includes all associated activities involved in patching potholes in concrete pavements.

128 Jacking of concrete slabs

Includes all associated activities involved in jacking of concrete pavement slabs.

130 Surface Sweeping

The removal of all loose material accumulated on the road surface, by hand or mechanical sweeping, including hand removal or larger debris.

135 Surface Debris Removal

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

139 Other Bituminous Surface Work

Work carried out on the bituminous roadway surface not covered by Activities numbered 101, 102, 103, 105, 106, 107, 110, 111, 112, 115, 116, 117, 118, 120, 121, 122, 123, 130, 135 and 161.

140 Pavement Repairs (Manual)

The repair by hand of shoving pavement or asphalt surfacing (less than 1 m² 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.

141 Temporary Pavement Repairs (Mechanical)

The temporary repair of failed pavement through shoving by mechanical trimming of raised pavement to the level of the surrounding bitumen seal surface level. Includes the application of bituminous seal coat and cover aggregate over the trimmed areas.

142 Emergency Temporary Pavement Repairs

The emergency temporary repair to the roadway surface to eliminate hazardous conditions until permanent repairs can be made.

143 Pavement Repairs (Mechanical) - Minor

The repair by machine of shoving pavement or asphalt surfacing of size less than 500 m² by removal of deteriorated pavement and/or asphalt and replacement with new pavement material and asphalt, to profile. May include treatment of subgrade materials and re-working, as appropriate. Nominal depth of treatment is 200 mm. Treatment greater than this depth is covered by Activity numbered 144.

144 Pavement Repairs (Mechanical) - Major

The repair by machine of shoving pavement or asphalt surfacing of size less than 500 m² by removal of deteriorated pavement and/or asphalt and replacement with new pavement material and asphalt, to profile. May include treatment of subgrade materials and re-working, as appropriate. Refers to pavement repairs greater than 200 mm nominal depth.

145 Scarify and Reshape Existing Pavement

The repair by machine of out of shape bituminous pavement (less than 500 m²), 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.

150 Insitu-stabilisation

The stabilisation in place of a subgrade or an existing pavement (less than 500 m²). May include the addition of paving material to maintain profiles as appropriate. See Activities numbered 151 and 152 for the supply and cartage of paving material respectively.

151 Gravel Supply-Insitu Stabilisation

The supply of paving material for Activity numbered 135, Insitu Stabilisation. Includes all costs associated with the winning of the material for the works.

152 Gravel Cartage-Insitu Stabilisation

The cartage of paving material for Activity numbered 150, Insitu Stabilisation. Includes all costs associated with the loading and cartage of the material to the work site.

155 Asphalt Overlay

Application of an asphalt overlay to an existing distressed pavement (less than 500 m²).

156 Replace Excavated Asphalt

The restoring to level with new asphalt of areas where deteriorated asphalt has been excavated.

157 Excavate and Replace Asphalt

The excavation of deteriorated asphalt and the restoration to profile with new asphalt in one operation.

160 Recycling

The heating and removal of an existing asphalt surface, the incorporation of rejuvenating agent and new hot-mixed asphalt, and the relaying and compaction of the mixed material.

161 Profile Planing

The planing back of asphaltic concrete roadway surface profile to sound material or specified depth. Does not include replacement with new asphaltic concrete material.

169 Other Pavement Work

Any work on the sealed roadway pavement not covered by Activities numbered 140, 141, 142, 143, 144, 145, 150, 151, 152, 155, 156, 157 and 160.

200 UNSEALED SURFACES

201 Light Formation Grading

The light trimming by grader of unsealed formation surface to restore rideability.

202 Medium Formation Grading

The grading of unsealed formation to reinstate the correct profile. Includes degrassing, incorporation of water and compaction. Does not include scarifying or addition of imported gravel/material from outside the worksite to build up existing material. A nominated maximum one way lead distance of twenty (20) km applies for water cartage.

203 Heavy Formation Grading

The grading of unsealed formation to reinstate the correct profile. Includes degrassing, scarifying, the incorporation of water and proper compaction. May include the addition of imported gravel/material in isolated areas where the gravel crust is broken or there is change in the surface composition. Also includes treatment of adjacent surface drainage. A nominated maximum one way lead distance of twenty (20) km applies for water cartage.

204 Gravel/Material Supply - Heavy Formation Grading

The supply on site of imported gravel/material that may be required to reinstate the correct profile and or level when carrying out Activity numbered 203, Heavy Formation Grading. Includes all operations involved with winning, loading and cartage of the gravel/material to the job site.

205 Resheeting

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 degrassing, scarifying and preparation of the existing formation and the incorporation of water and proper compaction of the formation and imported gravel/material.

A nominated maximum one way lead distance of twenty (20) km applies for water and gravel/material cartage. For greater cartage distances, see Activities numbered 230 and 231.

206 Remove Formation Material and Replace if Required

The removal of unsuitable formation material and the reinstatement to correct profile. May include the actual replacement of the existing formation material.

207 Formation Mechanical Stabilisation

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, degrassing, scarifying and preparation of the existing formation, the incorporation of water and the proper mixing and compaction of the stabilised formation material.

208 Accessibility Grading

The light trimming by grader of unsealed formation material to restore access for light vehicles.

214 Other Formation Work

Any work on formation not covered by Activities numbered 201, 202, 203, 204, 205, 206, 207, 208, 230 and 231.

215 Light Shoulder Grading - Rural

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.

216 Heavy Shoulder Grading - Rural

The grading of unsealed shoulders located in a rural environment (greater than 60 kph speed restriction) to reinstate the correct profile. Includes the incorporation of water and proper compaction of the shoulder material. May include the addition of imported gravel/material. A nominated maximum one way lead distance of twenty (20) km applies for water cartage.

217 Light Shoulder Grading - Urban

The grading of unsealed shoulders located in an urban environment to remove vegetation. Includes the removals of any windrows of vegetation and other debris that may otherwise impede drainage or encourage scour.

218 Heavy Shoulder Grading - Urban

The grading of unsealed shoulders located in an urban environment to reinstate the correct profile. Includes the incorporation of water and proper compaction of the shoulder material. May include the addition of imported gravel/material.

219 Gravel/Material Supply-Heavy Shoulder Grading

The supply on site of imported gravel/material that may be required to reinstate the correct profile and or level when carrying out Activities numbered 216, Heavy Shoulder Grading-Rural and 218, Heavy Shoulder Grading-Urban. Includes all operations involved with winning, loading and cartage of the gravel/material to the job site.

220 Shoulder Pothole Patching

The manual placement and compaction of gravel into an isolated pothole or series of potholes in a gravel shoulder.

This Activity would normally be undertaken as a temporary measure to make a road shoulder safe until Activities numbered 221 or 216, Resheeting or Heavy Shoulder Grading, can be completed.

221 Resheeting

The addition of material to unsealed shoulders to correct excess shoulder crossfall and/or reduced shoulder width. A nominated maximum one way lead distance of twenty (20) km applies for water and gravel/material cartage. For greater cartage distances, see Activities numbered 230 and 231. Work includes:

- removal of vegetation
- scarifying, shaping existing material and compacting, and
- incorporation of water, if required and compaction and trimming of added material, and
- reinstatement of roadside furniture.

222 Remove Shoulder Material and Replace if Required

The removal of unsuitable shoulder material and the reinstatement to correct profile. May include the replacement of the existing shoulder material.

229 Other Unsealed Shoulder Work

Any work on unsealed roadway shoulder not covered by Activities numbered 215, 216, 217, 218, 219, 220, 221, 222, 230 and 231.

230 Abnormal Water Cartage

The cartage of water over lead distances greater than the nominated maximum limit for normal cartage of twenty (20) km: Applies to works carried out under Activities numbered 202, 203, 205, 216 and 221.

231 Abnormal Gravel/Material Cartage

The cartage of gravel/material over lead distances greater than the nominated maximum limit for normal cartage of twenty (20) km: Applies to works carried out under Activities numbered 221 and 215.

300 DRAINAGE

301 Install Earth Surface Drain

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 culvert structures, see Activity numbered 320.

302 Repair Earth Surface Drains

The repair to correct profile and level of damaged earth surface drains.

303 Install Concrete Surface Drains

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 culvert structures. See Activity numbered 320.

304 Repair Concrete Surface Drains

The repair to correct profile and level of damaged concrete surface drains.

305 Clean Earth and Concrete Surface Drains

The restoration of existing earth and concrete drains that are ineffective due to insufficient depth or insufficient grade.

306 Repair or Replace Concrete Slabs or Paving Blocks, Kerbs and Dykes

The repair or replacement of concrete or paving blocks, kerbs and dykes.

310 Installation and Removal of Erosion and Sediment Control Measures

All works associated with the installation of erosion and sediment control devices to control run off from areas of exposed earth resulting from maintenance operations.

311 Maintenance of Erosion and Sediment Control Measures

All works associated with the maintenance of erosion and sediment control devices installed under Activity numbered 769 to ensure proper functioning of the facility in service.

312 Service Sedimentation Ponds

All works associated with the routine servicing of roadside sedimentation ponds to ensure their planned operation in service is not compromised.

313 Repair Sedimentation Ponds

All works associated with the repair of sedimentation ponds to ensure the facility operates effectively in service.

319 Other Surface Drain Work

Any work related to earth and concrete surface drains not covered by Activities numbered 301, 302, 303, 304, 305, 306, 310, 311, 312, 313 and 326.

320 Install Culverts and Pipes

All work associated with the installation of a new culvert or pipe facility. Includes back filling to profile and the provision of associated catch and outlet surface drains.

321 Clean Culverts, Pipes and Pits - Minor

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.

322 Clean Culvert, Pipes and Pits General - Major

The cleaning by machine of debris and silt impeding the free flow of water through culverts, pipes and pits and their inlets and outlets.

323 Repair Concrete Culverts, Pipes and Pits

The repair of damaged concrete culverts, pipes and pits.

324 Repair Steel Drainage Structures

The repair of damaged or deteriorated steel culverts structures or pipes.

325 Repair Inlet and Outlet Scour

All work associated with restoring scoured areas of drainage inlet and outlets to a stable condition.

326 Repair or Install Scour Blocks

All work and materials associated with the installation of new or the repair of existing scour blocks.

327 Replace or Install Cut Off Walls

The replacement or installation of cut off walls to drainage structures.

329 Other Culvert, Pipe and Pit Work

Any work carried out to Culverts, Pipes or Pits not covered by Activities numbered 320, 321, 322, 323, 324, 325 and 327.

330 Install Subsoil Drains

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 Activities numbered 140, 143 and 144.

331 Inspect and Service Subsoil Drains

Inspection and servicing of subsoil drains. Includes routine drain flush out and the removal of all vegetation and other material which could restrict the flow of water from the subsoil drains as well as the repair or replacement of missing or damaged marker posts.

332 Repair Subsoil Drains

Excavate the road formation and repair subsoil drains, backfill and restore pavement and shoulder as required.

339 Other Subsoil Drain Work

Includes work carried out on subsoil drain systems not included under Activities numbered 330, 331 and 332.

340 Clean Floodways

The cleaning of debris, silt and regrowth of vegetation from floodway sections.

341 Repair Floodways

The reinstatement of damaged or deteriorated floodway structures. Includes work carried out on scour repairs to concrete and stone pitched batter and apron protection.

342 Repair Floodway Slopes and Margins

The repair of deteriorated or damaged concrete slopes and margins to original cross section. Includes the supply of all materials.

349 Other Floodway Work

Includes work carried out on floodway structures not included under Activities numbered 340, 341 and 342 inclusive.

400 ROADSIDE

401 Tractor Slashing, Rural

The tractor slashing of vegetation within the road reserve in a rural environment. Excludes herbicide spraying around guide posts, refer Activity numbered 407.

402 Tractor Slashing, Urban

The tractor slashing of vegetation within the road reserve in urban built up areas.

403 Tractor Slashing - Boom Mower

The tractor slashing of vegetation within the road reserve using a boom mower attachment.

404 Hand-Mowing

The mowing of grass and vegetation by hand-mower and/or brush cutter.

405 Clearing

The removal or pruning of all roadside vegetation, other than grass, for the purpose of aesthetic or visibility clearing. Includes trees too close to the road and branches/trees likely to fall on the road. Also includes chipping, grading, weeding and burning operations.

406 Herbicide Spot Spraying Declared Plants

The identification and eradication of declared plants within the road reserve (including rest areas owned by TMR) includes either sprayed or manual application of chemical herbicide. Excludes the spraying of other plants carried out under Activity No 407.

407 Herbicide Spraying

The supply and application by spraying of chemical herbicide for the control of declared plants and other vegetation.

408 Tractor Treatment, Chemical

The chemical treatment of vegetation within the road reserve by tractor mowing.

409 Seeding or Planting

The supply, planting and maintenance of shrubs and trees including fertilising, watering, mulching and weeding.

410 Landscape Planting - Urban

The supply, planting and maintenance of shrubs and trees including fertilising, watering, mulching and weeding in an urban environment.

411 Maintain Landscaped Shrubs

All works associated with the ongoing maintenance of plants, shrubs and trees planted under Activity No 410. Includes fertilising, watering and weeding of facility.

412 Mulching

The treatment of roadside by mulching to eliminate the growth of vegetation. Includes poisoning of existing ground cover supply and placing of a weed inhibiting membrane and laying of mulch material.

415 Roadside Burning Off

All works associated with the treatment of vegetation on the road reserve through a management burn program. The works may be required as a hazard reduction measure or for ecological purposes.

419 Other Vegetation Control Works

Any work carried out to control vegetation on the road reservation not covered by Activities numbered 182, 765 and 411 to 418 inclusive.

420 Roadside Litter Collection - Rural

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 numbered 421 for litter collections in urban built up areas.

421 Roadside Litter Collection - Urban

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 urban build up areas. Includes the repair and maintenance of receptacles.

422 Graffiti Removal

The removal of graffiti from road infrastructure assets.

423 Roadside Sweeping

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, refer Activity numbered 130.

424 Removal of Unauthorised Signs

The removal of unauthorised signs from the road reservation.

425 Earthworks, Visibility Clearing

Excavation undertaken to clear visibility lines.

426 Repair Stability Problems

Excavate unstable material, install geotextile, rockfill and/or subsoil drains, backfill the road formation and restore pavement and shoulder as required by the design approved by the District Manager.

427 Exclusion Zone Fencing (Cultural Heritage Sites)

All activities associated with isolating cultural heritage sites including fencing.

429 Other Roadside Work

Any work carried out on the roadside not covered by Activities numbered 420, 421, 422, 423, 424, 425 and 426.

430 Services Restoration

All works 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.

439 Other Restoration Work

Any other restoration work done not covered by Activities numbered 430 and 452.

440 Rest Area Servicing

The servicing of all aspects of rest areas controlled by Queensland Department of Main Roads, necessary for the safety and convenience of the public.

441 Driver Reviver Site Servicing

The routine servicing of locations on the road reserve used as "Driver Reviver Sites". Excludes servicing work carried out where a Rest Area is used as a "Driver Reviver" site, refer Activity numbered 440.

449 Other Services Work

All works associated with any other roadside service type Activity undertaken in addition to that associated with Activities numbered 440 and 441.

450 After Hours Call Out Service

All activities undertaken following an after hours call out, by the Police or other recognised authority, to an emergency situation on the road network.

452 Emergency Call Out Activities

All activities undertaken following a call out, by the Police or recognised authority, to an emergency situation on the road network.

500 ROAD FURNITURE

501 Install New Signs (excluding Guide Signs)

The installation of new signs excluding guide signs where none previously existed. Work includes supply of posts and fittings.

502 Repair Signs (excluding Guide Signs)

The repair of damaged or deteriorated sign faces excluding guide signs and supports. May include the replacement of damaged or deteriorated facilities with new sign facings and/or supports at that location.

503 Relocate Existing Signs (excluding Guide Signs)

All work associated with the relocation of existing signs excluding guide signs.

504 Cleaning Signs

The cleaning of sign faces to remove dirt and other contaminants to restore the reflectivity and appearance of signs.

505 Install New Guide Signs

The installation of new guide signs where none previously existed. See Activity numbered 501 for the installation of other types of signs.

506 Repair Guide Signs

The repair of damaged or deteriorated guide sign faces and supports. May include the replacement of damaged or deteriorated facilities with new sign facings and/or supports at that location.

507 Relocate Guide Signs

All work associated with the relocation of existing guide signs. See Activity numbered 503 for the relocation of other types of signs.

509 Other Sign Work

All other signwork not covered by Activities numbered 501, 502, 503, 504, 505, 506 and 507.

510 Install New Guide Markers

The provision of guide markers to delineate the road alignment.

511 Clean and/or Paint Guide Markers

The cleaning of guide markers to remove dirt and other contaminants and restore their white colour.

512 Repair or Replace Guide Markers

The repair or replacement of guide markers to restore delineation of the road alignment.

513 Replace Guide Post Delineators

The replacement of guide post delineators to restore delineation of the road alignment.

514 Repair Guide Markers

The repair of roadside guide markers to restore delineation of the road alignment.

515 Replace Guide Markers

The replacement of defective roadside markers with new markers to restore delineation of the road alignment.

519 Other Guide Post and Marker Work

Any other work carried out to guide posts and markers not covered by Activities numbered 510, 511, 512, 513, 514 and 515.

520 Install New Guard Rail, Barrier Furniture

The installation of steel beam guard-rail, including materials, and application of all protective coatings.

521 Clean and/or Paint Guard Rail, Barrier Furniture

The cleaning of guardrail and barrier furniture to remove dirt and other contaminants and/or its painting.

522 Repair or Replace Guard Rail, Barrier Furniture

The repair or replacement of damaged guardrails/barrier furniture.

523 Repair Guardrail Barrier Furniture

All works associated with the repair of damaged roadside guardrail or other barrier furniture.

524 Replace Guardrail, Barrier Furniture

All works associated with the replacement of damaged roadside guardrail or other barrier furniture with new barrier materials.

525 Replace Guardrail Delineators

All works associated with the replacement of defective delineators on roadside guardrail furniture.

530 Repair Wire Rope Barrier

All works associated with the repair of damaged roadside wire rope barrier furniture.

532 Repair Ingal Barrier

All works associated with the repair of damaged roadside ingal barrier furniture.

534 Repair Impact Barrier Furniture

All work associated with the repair or replacement of special purpose impact roadside facilities. Does not include the repair of damaged roadside barrier furniture, refer Activities numbered 522, 523, 524, 530 and 532.

550 Emergency Roadside Phone Repairs

The repair or replacement of emergency roadside phones to restore operation.

551 Emergency Roadside Phone Servicing

All works associated with the routine servicing of roadside emergency phones. Includes inspections to monitor serviceability of the phones, servicing and minor repair works.

559 Other Furniture Repairs

Any other work carried out to barrier furniture not covered by Activities numbered 520, 521, 522, 523, 524, 525, 530, 532, 534, 550 and 551.

600 LIGHTING AND TRAFFIC SIGNALS

601 Replace Lamps and Clean Lenses (Bulk Change)

The replacement of all lamps whether defective or otherwise and cleaning of lenses according to a regular maintenance program (Preventative Maintenance).

602 Replacement Defective Lamps and Clean Lenses (Emergent Change)

The replacement of any defective lamps and cleaning of lenses if necessary due to fault call-out (Response Maintenance).

603 Replace Lamps and Clean Emitting and Reflecting Surfaces - Scheduled (Bulk)

The replacement of all lamps whether defective or otherwise and the cleaning of emitting and reflective surfaces according to a regular maintenance program (Preventative Maintenance).

604 Replace Lamps and Clean Emitting and Reflecting Surfaces - Individual (Unscheduled)

The replacement of any defective lamps and cleaning of emitting and reflective surfaces due to a fault call-out.

605 Clean Light Emitting and Reflecting Surfaces - Scheduled (Bulk)

The cleaning of emitting and reflective surfaces of lighting and power installations according to a regular maintenance program (Preventative Maintenance).

606 Modify Traffic Signals - Add Lanterns

The 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
- jointing of new loop wire to existing detector feed cable.

607 Modify Traffic Signals - Remove Lanterns

The removal of lanterns from posts, poles or outreaches including:

- disconnecting lantern cable cores from finial terminals
- removal of lantern including straps

608 Routine Lighting and Power Servicing

All routine servicing work carried out to lights including cleaning using relamping buckets. Includes street and bridge lighting, feature lighting, lighting on pedestrian structures and crossings and navigation lighting on bridges where applicable.

609 Lighting and Power, General

General work carried out to lighting facilities. Includes repairs (excluding associated electrical pits) and improvements, to facilities.

610 Routine Signals Servicing

Work carried out for Preventative Maintenance to designated items of signals installation according to a maintenance interval program.

619 Traffic Signal Work, General

General work carried out to traffic facilities. Includes non-routine servicing, repairs, improvements, call out activities, loop repairs and works associated with traffic performance investigations.

620 Repair Inductive Loops

The disconnection and rejoining of faulty connection of loop wire to detector feed cable.

621 Inductive Loops (Re-cut Loop)

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
- jointing of new loop wire to existing detector feed cable

622 PSC Controllers - Install New Personality

The removal of existing personality, the installation of a new personality and viewing of at least one complete phase sequence of traffic signals to verify its correct operation.

623 Replace Pedestrian Crossing Push Buttons

The replacement of standard type pedestrian push buttons with audio tactile type including driver unit.

624 Traffic Signal - Coordination Servicing

To be advised.

627 CCTV (Closed Circuit Television) Maintenance and Servicing

All works associated with maintaining CCTVs.

628 VMS (Variable Messaging Signs) Maintenance and Servicing

Covers all activities associated with maintaining VMSs.

629 Routine Traffic Management Equipment Servicing

All works carried out for Preventative Maintenance to designated items of traffic management equipment according to a maintenance interval program.

630 Accident Damage - Straighten Bent Post and Reinstate Post Foundation

The straightening of a bent post and/or bent foundation bolts caused by an accident.

631 Accident / Storm Damage - Re-aim Lanterns

The re-aiming of lanterns displaced by an accident or storm.

632 Accident Damage - Replace Lanterns, Posts and Foundations

The replacement of any damaged lanterns, posts and foundations caused by an accident that are unable to be satisfactorily repaired.

633 Accident Damage - Replace Post and Foundations and Reinstate Lanterns from Old Post

The removal of lanterns not damaged, replacement of accident damaged post and foundation unable to be reinstated and reinstatement of existing lanterns.

634 Reinstate Damaged Poles and Lighting

All works associated with the reinstatement of damaged light and power pole supports and associated fittings.

635 Repair Minor Damage to Electrical Pits

All works associated with the repair of minor damage to electrical pits associated with lighting or power asset facilities.

636 Replace Damaged Pit Covers

The replacement of damaged pit cover/s with new cover and disposal of damaged cover.

637 Replace Damaged Electrical Pit Covers

The replacement of damaged electrical pit covers with new covers. Includes the proper disposal of the damaged cover.

640 Repair Damaged Pits

The removal, disposal and replacement of damaged pits including cover/s where necessary.

641 Repaint Controller

The cleaning down including removal of posters and repainting of controller cabinet.

642 Repaint Mast Arms including Hardware

The cleaning down including removal of posters and repainting of mast arms and associated hardware.

643 Repaint Posts including Hardware

The cleaning down including removal of posters and repainting of posts and associated hardware.

650 After Hours Call Out

The after hours inspection of a traffic signals site due to a fault report to ascertain fault and make site safe but not including remedial action required.

700 TRAFFIC DELINEATION

701 Repaint Road Centre Lines, Minor

702 Repaint Road Centre Lines, Major

703 Repaint Double Barrier Lines – Day work

704 Paint New Yellow Line

705 Repaint Yellow Line

709 Repaint Double Barrier Line, General

- 710 Repaint Road Edge Lines, Minor**
- 711 Repaint Road Edge Line, Major**
- 712 Repaint Edge Lines, 100mm Width**
- 713 Repaint Edge Lines – 150mm Width**
- 714 Repaint Unbroken Lane Line, General**
- 719 Repaint Single Barrier Line, General**
- 720 Repaint Single Broken Lines**
- 721 Repaint Barrier Broken Lines**
- 722 Repaint Broken Lane Line, General**
- 723 Repaint Continuity Line, General**
- 724 Repaint Broken Line, General**
- 725 Repaint 150 mm Outline, General**

All work associated with the renovation of road line marking in general. Includes sweeping, spotting, symbolising and repainting.

729 Urban Line Marking - Minor

All works associated with minor line marking of lines and markings in an urban built up environment.

730 Repaint Lateral Markings

All works associated with the renovation of road line marking using water based paint. Includes sweeping, spotting, symbolising and repainting.

731 Remark Road Markings

The renovation or replacement of road marking. Includes transverse lines, chevrons, arrows, legends and painted medians.

735 Thermoplastic Line Marking

All works associated with the use of thermoplastic material to mark new lines or markings or retreat deteriorated existing lines and markings.

736 Audiotactile Linemarking

All works associated with the use of audiotactile materials to mark new lines or markings or retreat existing lines or markings.

740 Raised Pavement Markers

The installation of new or replacement of missing raised pavement markers. Includes the supply of markers.

745 Remove Unwanted Road Lines

All works associated with the removal of unwanted roadlines.

750 Remove Unwanted Markings by Grinding

All works associated with the removal of unwanted road markings by grinding.

759 Line Marking - General

Any line marking works not covered by Activities numbered 701, 702, 703,704,705, 709, 710, 711, 712, 713, 714, 719, 720, 721, 722, 723, 724, 725, 729, 730, 731, 735, 736, 740, 745 and 750.

800 STRUCTURES

801 Routine Bridge Servicing (Concrete)

All works associated with the routine servicing of concrete components of bridges. Includes tightening of nuts, bolts and plates, clearing of the deck surface and scuppers of debris and other foreign materials and the cleaning of girder bearing areas.

802 Routine Bridge Servicing (Steel)

All works associated with the routine servicing of steel components of bridges. Include tightening of nuts, bolts and plates, clearing of the deck surface and scuppers of debris and other foreign materials and the cleaning of girder bearing areas.

803 Routine Bridge Servicing (Timber)

All works associated with the routine servicing of timber components of bridges. Include tightening of nuts, bolts and plates, clearing of the deck surface and scuppers of debris and other foreign materials and the cleaning of girder bearing areas.

805 Reinstate/Repaint Handrails and Guardrails

All works associated with the routine reinstatement-repainting of hand rails and guard railings along the bridge structure.

806 Repair Deck Wearing Surface

Details to be advised.

807 Repair Footway Surface

All works associated with the repair of damaged footway surfaces associated with structures on the roadway.

809 Routine Bridge Servicing, General

Minor maintenance works carried out to timber and concrete bridge structures of a Preventative Maintenance servicing nature. For example:

- tightening of nuts, bolts and plates etc.
- painting of hand rails and guard railings along the bridge structure
- routine clearing of the deck surface and scuppers of debris or other foreign materials
- minor emergency reinstatement-replacement of isolated items such as timber deck, running plank, kerb or rails and concrete kerbs, rail posts
- termite treatment in timber bridges
- minor works necessary to maintain a free flowing waterway such as the clearing of trees and vegetation, and
- cleaning of girder bearing areas
- minor repairs to spalled areas.

810 Clean Out Expansion Joints and Associated Drains

All works associated with the cleaning out of membranes and associated drains and the removal of foreign objects from deck expansion joints.

Note: Some joints may have membranes covered by plates. The works include the removal of plates, cleaning of the membrane and plate reinstatement in these instances.

811 Clean Out Vent Holes in Superstructure

All works associated with the cleaning out of vent holes in bridge superstructures and the removal of foreign objects.

812 Clean Bearings, Bearing Sills and Sill Drains

All works associated with the cleaning of bridge bearings, bearing sills and sill drains and the removal of foreign objects.

813 Tighten / Replace Concrete Deck Joint Bolts

All works associated with the tightening of loose bolts in bridge deck joints. Includes the replacement of any missing bolts.

815 Replace/Repair Expansion Joints (Concrete)

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.

819 Bridgework, Other Structural (Concrete)

All other structural works carried out to concrete components of bridges not covered by Activities numbered 801, 815 and 851.

820 Clean/Repaint Steel Elements

The preparation by appropriate cleaning and repainting of steel elements of bridge structures.

821 Clean Aggressive Contamination from Steel Girders

All works associated with the removal by cleaning of aggressive materials from steel girders to prevent contamination of the material.

822 Repair Minor Damage to Steel Elements

All works associated with the repair of minor damage to steel elements of bridge structures.

823 Replace/Repair Expansion Joints (Steel)

All works associated with the repair or replacement of missing or damaged bridge expansion joints on bridges of predominately steel construction to provide an adequate seal to protect the bridge components from the ingress of moisture and foreign materials.

829 Bridgework, Other Structural (Steel)

Any other structural work carried out to steel elements of bridge structures not covered by Activities numbered 822 and 823.

830 Tighten / Replace Timber Joint Bolts

All works associated with the tightening of loose bolts on timber bridge components. Includes the replacement of any missing bolts.

831 Timber Preservative / Water proofing Treatment

All works associated with the water proofing of timber bridge components using a timber preservative product. Includes the coating of damaged areas, holes and exposed end grains with diffusing preservative and water proofing ends of timber members, if required.

832 Temporary Propping of Defective Timber Components

All works associated with the temporary propping of defective timber components on a structure until permanent repairs can be undertaken.

833 Reinstate Timber Piles

All works associated with the removal and replacement or splicing of deteriorated unserviceable timber piles of bridge structures.

834 Repair/Replace Timber Corbels

The removal and replacement or repair of any timber bridge corbel determined to be in an unserviceable structural condition.

835 Repair / Replace Timber Headstocks

All works associated with the removal and replacement or repair of any timber bridge headstock determined to be in an unserviceable structural condition.

836 Replace Timber Girders

The removal and replacement of any timber bridge girder in an unserviceable structural condition.

837 Replace Deck Planks with New Planks

The removal and replacement of any timber bridge deck plank in an unserviceable structural condition.

838 Repair/Replace Kerbs

The removal and replacement or repair of any timber or concrete bridge kerb determined to be in a dangerous or unserviceable structural condition.

839 Treat for Termites

All works associated with the treatment by poisoning of termite infestations in timber components of timber bridges.

849 Bridgework, Other Structural (Timber)

All other structural works carried out to timber components of bridges not covered by Activities numbered 803, 833, 834, 835, 836, 837, 838 and 852.

850 Replace/Repair Relieving Slabs

All works associated with the repair or replacement of cracked and unserviceable relieving slabs to bridge structures.

851 Repair Spalled and Cracked Structural Concrete Elements

All works associated with the refurbishment of spalled and cracked concrete sections of concrete components of bridges.

852 Repair Spalled and Cracked Structural Concrete Elements

All works associated with the refurbishment of spalled and cracked concrete elements on bridges of predominantly timber construction. Includes concrete kerbs and rail supports.

853 Repair Spalled and Cracked Structural Concrete Elements

All works associated with the refurbishment of spalled and cracked concrete elements on bridges of predominantly steel construction. Includes concrete kerbs and rail supports.

854 Clean Out Abutment and Wing Wall Weepholes

All works associated with the cleaning out of weepholes in abutments and wing walls to ensure the free flow of seepage waters.

855 Repair/Replace Batter Protection

All works associated with the reinstatement-replacement of deteriorated or damaged bridge batter protection works of bridge structures.

856 Clean Out Waterways

All works required to maintain a free flowing bridged waterway. Includes the clearing of trees and other vegetation and any debris load on the structure in the waterway. Includes the proper disposal of cleared materials away from the waterway.

859 Bridge Work, General

All general works of a non-routine nature carried out to timber, concrete and steel bridge components not covered by Activity numbered 809.

860 Routine Grid Servicing

All work of a routine nature necessary to maintain a sound and effective grid. Includes desilting of opening and up keep of grid hazard signs.

861 Repair or Replace Grids

All works associated with the repair of defective grids. Includes structural repair to rails and bearers and may involve complete structural replacement.

862 Emergency Grid Repairs

The unplanned repair of grid structures requiring immediate attention for safety reasons. Work includes welding loose grid rails and the installation of new rails where appropriate.

865 Rail Crossing Servicing

Works of a routine nature necessary to maintain a sound crossing. Includes pavement repairs where the defect has resulted from the presence of the rails.

870 Repair Noise Barriers

All works associated with the repair of roadside noise barrier facilities.

875 Repair of Restraining Structures - Gabions, Reinforced Walls

All work associated with the repair of restraining structures such as gabions and reinforced walls.

880 Repair Roadside Fences

All works associated with the repair of roadside fencing.

890 Service Passenger Facilities

All works associated with the routine servicing of roadside passenger facilities owned by the department.

891 Repair Passenger Facilities

All works associated with the repair of roadside passenger facilities owned by the department.

899 Other Miscellaneous Structure Work

Any other work to structures not covered by Activities numbered 860, 861, 862, 865, 870, 875, 880, 890 and 891.

900 OVERHEADS

901 RMPC Joint Maintenance Requirement Assessment

All works associated with the joint departmental/Contractor assessment of the network for the purpose of determining the extent of Activities required for the forthcoming Contract Period.

907 Prepare Cultural Heritage Management Plan

Covers all activities involved in preparing a cultural heritage management plan.

908 Implement, Monitor and maintain Cultural Heritage Management

All work associated with implementing, monitoring and maintaining a cultural heritage management plan.

910 Preparation of Environmental Management Plan (Maintenance)

All works associated with the preparation and submission (including any amendments required for approval) of an Environmental Management Plan (Maintenance) for the Contract.

911 Implementation, Monitoring and Updating of Environmental Management Plan (Maintenance)

All works associated with the implementation, monitoring and updating of an Environmental Management Plan (Maintenance) over the Contract Period.

912 Payment of Permits and Fees (Environmental)

The payment through reimbursement to the Contractor by the department of the value of permits and fees required for compliance with the applicable Federal, State and Local Government Environmental Legislation.

920 Electricity Supply - Traffic Signals

The cost incurred for electricity charges for the running of traffic signals.

921 Electricity Supply, Lighting

The cost of electricity supply incurred from a power authority for the operation of lighting asset facilities.

922 Phone Charges - Traffic Signals

The costs incurred for phone charges for the running of traffic signals.

923 Phone Charges - Traffic Signal Coordination

The costs incurred for phone charges for Traffic Area Response System connection from controllers to node base.

930 Modify and Digitise Computerised As-constructed Drawings

The updating of existing drawings to document as constructed changes to the design including the obtaining of electronic file from original source of design.

931 Modify Paper-based As Constructed Drawings

The updating of existing drawings to document as constructed changes to the design including the obtaining of drawings from original source of design.

940 Major Bridge Inspections, General

The detailed assessment of bridge structures, timber, concrete and steel types, to identify the present state of each bridge component. Includes the test boring of timber components.

941 Level 1 Bridge Inspections

All works associated with undertaking and recording a Level 1 type bridge inspection under RMPC.

942 Prepare Bridge Information System Forms

All works associated with the completion of structural/inventory verification forms compatible with the requirements of the Bridge Information System.

943 Data Entry – Bridge Information System

All works associated with the entry of verification, inspection and maintenance data into the Bridge Information System following inspections, see Activity numbered 941 and the recording of information compatible with the Bridge Information System, see Activity numbered 942.

950 Damages Recovery

The costs recovered as a result of claims for damages to the network road infrastructure assets.

960 Alliance Performance Limb Payment

The costs associated with performance limb payment for RMPC contract being undertaken through an alliance delivery approach

970 Licence and Ongoing maintenance fees for Transport and Main Roads accepted Maintenance Management System (MMS)

Ongoing MMS licence fees/maintenance cost /replacement cost of MMS field equipment

5.2 Maintenance Activity Payment Types

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
100	Sealed Surfaces			
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 ³ (loose)

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
105	Pothole Patching	Normal	Unit Rate	Tonnes
106	Pothole Patching with Emulsion/Aggregate	Normal	Unit Rate	m ³
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 linear metres per 1 kilometre	Normal	Unit Rate	Tonnes
111	Surface Correction with Premix/Asphalt (Mechanical)- Minor < 150 linear metres per 1 kilometre	Normal	Unit Rate	Tonnes
112	Surface Correction with Emulsion/Aggregate - Minor < 150 linear metres per 1 kilometre	Normal	Unit Rate	m ³
113	Surface Correction - Major < 150 linear metres per 1 kilometre	Normal	Unit Rate	m ²
114	Surface Enrichment – Major (≥ 150 linear metres per 1 kilometre)	Normal	Unit Rate	m ²
115	Surface Enrichment – Minor (≤ 150 linear metres per 1 kilometre)	Normal	Unit Rate	m ²
117	Reseal – Major (≥ 150 linear metres per 1 kilometre)	Normal	Unit Rate	m ²
		Prov. Sum	Fixed Price	Dollars
118	Seal Coating (Minor) - < 150 linear metres per 1 kilometre	Normal	Unit Rate	m ²
		Prov. Sum	Fixed Price	Dollars
119	Surface Correction (Skid Resistance)	Normal	Unit Rate	m ²
120	Fill Cracks	Normal	Unit Rate	Litres
121	Crack Treatment with Emulsion/Aggregate	Normal	Unit Rate	m ³
122	Crack Treatment with Strain Alleviating Product	Normal	Unit Rate	m ²
123	Surface Strip Treatment of Cracks	Normal	Unit Rate	Linear Metres
124	Concrete Joint and Crack Treatment	Normal	Unit Rate	Linear Metres
125	Stitch Treat Cracks in Concrete Roads	Normal	Unit Rate	Linear Metres
126	Replacement of Concrete Joint Sealant	Prov. Sum	Fixed Price	Dollars
127	Concrete Pothole Patching	Normal	Unit Rate	m ³
128	Jacking of Concrete Slab	Prov. Sum	Fixed Price	Dollars
129	Pavement Repairs, Concrete (Mechanical) – Minor (< 500 sq.m per km)	Normal	Unit Rate	m ²
130	Surface Sweeping	Normal	Unit Rate	m ²
		Prov. Sum	Fixed Price	Dollars
135	Surface Debris Removal	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
137	Rut Correction- Minor (< 100 metres per 1 km)	Normal	Unit Rate	Tonnes
138	Rut Correction- Major (≥ 100 metres per 1 km)	Normal	Unit Rate	Tonnes

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
139	Other Bituminous Surface Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
140	Pavement Repairs (Manual)	Normal	Unit Rate	m ²
141	Temporary Pavement Repairs (Mechanical)	Normal	Unit Rate	m ²
142	Emergency Temporary Pavement Repairs	Normal	Unit Rate	Tonnes
143	Pavement Repairs Gravel (Mechanical) Minor	Normal	Unit Rate	m ²
144	Subgrade Treatment in Conjunction with Pavement Repair Activity	Normal	Unit Rate	m ³
145	Scarify and Reshape Existing Pavement	Normal	Unit Rate	m ²
146	Pavement Repairs Asphalt (Mechanical) Minor (< 500 m ²)	Normal	Unit Rate	m ²
147	Pavement Repairs Gravel (Mechanical) – Major (≥ 500 m ²)	Normal	Unit Rate	m ²
148	Pavement Repairs Asphalt Gravel (Mechanical) – Major (≥ 500 m ² per km)	Normal	Unit Rate	m ²
151	Gravel Supply-Insitu Stabilisation	Normal	Unit Rate	m ³ (loose)
152	Gravel Cartage-Insitu Stabilisation	Normal	Unit Rate	m ³ (loose) - kms
153	Insitu-Stabilisation – Minor (< 500 m ²)	Normal	Unit Rate	m ³
154	Insitu-Stabilisation – Major (≥ 500 m ²)	Normal	Unit Rate	m ³
155	Asphalt Overlay – Major (≥ 150 linear metres)	Normal	Unit Rate	Tonnes
157	Excavate and Replace Asphalt – (Wearing Surface < 75 mm for areas, < 150 linear metres)	Normal	Unit Rate	Tonnes
158	Excavate and Replace Asphalt Wearing Surface (RAMC only)	Normal	Unit Rate	m ²
160	Recycling	Normal	Unit Rate	m ³
161	Profile Planing	Normal	Unit Rate	m ²
		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 ³
200	Unsealed Surfaces			
201	Light Formation Grading	Normal	Unit Rate	Kilometres – Metres Width
202	Medium Formation Grading	Normal	Unit Rate	Kilometres
203	Heavy Formation Grading	Normal	Unit Rate	Kilometres
204	Gravel/Material Supply - Heavy Formation Grading	Normal	Unit Rate	m ³ (loose)
		Prov. Sum	Fixed Price	Dollars
205	Formation Resheeting – Minor (> 150 linear metre)	Normal	Unit Rate	m ³ (loose)

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
206	Remove Formation Material and Replace, if Required	Normal	Unit Rate	m ³ (loose)
207	Formation Mechanical Stabilisation – Minor (> 150 linear metre)	Normal	Unit Rate	m ³ (loose)
		Prov. Sum	Fixed Price	Dollars
208	Accessibility Grading	Normal	Unit Rate	Kilometres – Metres 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 ²
218	Heavy Shoulder Grading - Urban	Normal	Unit Rate	m ²
219	Gravel Supply - Heavy Shoulder Grading	Normal	Unit Rate	m ³ (loose)
		Prov. Sum	Fixed Price	Dollars
220	Shoulder Pothole Patching	Normal	Unit Rate	m ³ (loose)
221	Shoulder Resheeting	Normal	Unit Rate	m ³ (loose)
222	Remove Shoulder Material and Replace, if Required	Normal	Unit Rate	m ³ (loose)
229	Other Unsealed Shoulder Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
230	Abnormal Water Cartage	Normal	Unit Rate	Mega Litre kms
231	Abnormal Gravel Cartage	Normal	Unit Rate	m ³ (loose) - kms
300	Drainage			
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 ²
		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

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
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	Linear metres
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 ³
		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 ³
326	Repair Scour Blocks	Normal	Unit Rate	m ³
327	Replace or Install Cut-off Walls	Normal	Unit Rate	m ³
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	Linear metres
331	Inspect and/or Cleanout Subsoil Drains	Normal	Unit Rate	Linear metres
332	Repair Subsoil Drains	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
339	Other Subsoil Drain Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
340	Clean Floodways	Normal	Unit Rate	m ²
341	Repair Floodways	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
342	Repair Floodway Slopes and Margins	Normal	Unit Rate	m ³
		Prov. Sum	Fixed Price	Dollars
349	Other Floodway Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
400	Roadside			
401	Tractor Slashing, Rural	Normal	Unit Rate	Hectares

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
402	Tractor Slashing, Urban	Normal	Unit Rate	Hectares
403	Tractor Slashing - Boom Mower	Normal	Unit Rate	m ²
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
404	Hand Mowing	Normal	Unit Rate	m ²
		Prov. Sum	Fixed Price	Dollars
		Normal	Lump Sum	Dollars
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 ²
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 ²
415	Roadside Burning Off	Normal	Unit Rate	Hectares
		Prov. Sum	Fixed Price	Dollars
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 ³
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
421	Roadside Litter Collection - Urban	Normal	Unit Rate	m ³
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
422	Graffiti Removal	Normal	Unit Rate	m ²
		Prov. Sum	Fixed Price	Dollars
423	Roadside Sweeping	Normal	Unit Rate	Linear metres
424	Removal of Unauthorised Signs	Normal	Unit Rate	Each (Sign)
425	Earthworks, Visibility Clearing	Normal	Unit Rate	m ³
426	Repair Minor Stability Problems	Normal	Unit Rate	m ³

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
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
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	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
500	Road Furniture			
501	Install New and/or Relocate Existing Signs	Normal	Unit Rate	Each (Sign)
502	Repair Signs (excluding Guide Signs)	Normal	Unit Rate	Each (Sign)
		Prov. Sum	Fixed Price	Dollars
503	Relocate Existing Signs (excluding Guide Signs)	Normal	Unit Rate	Each (Sign)
504	Cleaning Signs	Normal	Unit Rate	Each (Sign)
505	Install New 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
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)

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
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)
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	Linear metres
		Prov. Sum	Fixed Price	Dollars
521	Clean and/or Paint Guardrail, Barrier Furniture	Normal	Unit Rate	Linear metres
522	Repair or Replace Guardrail, Barrier Furniture	Normal	Unit Rate	Dollars
		Prov. Sum	Fixed Price	Dollars
523	Repair Guardrail, Barrier Furniture	Normal	Unit Rate	Linear metres
524	Replace Guardrail, Barrier Furniture	Normal	Unit Rate	Linear metres
525	Replace Guardrail Delineators	Normal	Unit Rate	Each (Delineator)
530	Repair Wire Rope Barrier	Normal	Unit Rate	Linear metres
		Prov. Sum	Fixed Price	Dollars
531	Upgrade Existing Barrier End	Normal	Unit Rate	Each
532	Repair Ingal Barrier	Normal	Unit Rate	Linear metres
		Prov. Sum	Fixed Price	Dollars
533	Upgrade Existing Barrier	Normal	Unit Rate	Linear metres
534	Repair Impact Barrier Furniture	Normal	Unit Rate	Linear 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
600	Lighting and Traffic Signals			
601	Replace Traffic Signal Lamps and Clean Lanterns (Bulk Change)	Normal	Unit Rate	Each (Lamp)
		Prov. Sum	Fixed Price	Dollars
602	Replace Traffic Signals Defective Lamps and Clean Lanterns (Emergent Change)	Normal	Unit Rate	Each (Lamp)
		Prov. Sum	Fixed Price	Dollars

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
603	Replace Route Lighting Lamps and Clean Luminaries– (Bulk Scheduled)	Normal	Unit Rate	Each (Lamp)
		Prov. Sum	Fixed Price	Dollars
604	Replace Route Lighting Defective Lamps and Clean Luminaries - Individual (Unscheduled)	Normal	Unit Rate	Each (Lamp)
		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)
607	Modify Traffic Signals - Remove Lanterns	Normal	Unit Rate	Each (Lantern)
608	Routine Route Lighting and Power Servicing	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
609	Route Lighting and Power, General	Normal	Lump Sum	Each
		Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
610	Routine Traffic Signal Servicing	Normal	Lump Sum	Dollars
619	Traffic Signal Work, General	Normal	Lump Sum	Dollars
		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	Replace PTF Controller	Normal	Lump Sum	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	CCTV (Closed Circuit Television) Maintenance	Prov. Sum	Fixed Price	Dollars
628	VMS (Variable Messaging Signs) 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 Reinstate Lanterns from Old Pole	Normal	Unit Rate	Each (Pole)
		Prov. Sum	Fixed Price	Dollars

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
634	Reinstate Damaged Route Lighting Poles and Lighting	Normal	Unit Rate	Each (Pole)
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	After Hours Call Out Service – Traffic Signals	Prov. Sum	Fixed Price	Dollars
651	After Hours Call Out Service – Route Lighting Signals	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
700	Traffic Delineation			
701	Repaint Road Centre Lines, Minor	Normal	Unit Rate	Line Kms
702	Repaint Road Centre Lines, Major	Normal	Unit Rate	Line Kms
703	Repaint Double Barrier Lines, Daywork	Normal	Unit Rate	Line Kms
704	Paint New Yellow Line	Normal	Unit Rate	Line Kms
		Prov. Sum	Fixed Price	Dollars
705	Repaint Yellow Line	Normal	Unit Rate	Line Kms
		Prov. Sum	Fixed Price	Dollars
706	Supporting for Yellow Lines	Normal	Unit Rate	Line Kms
		Prov. Sum	Fixed Price	Dollars
707	Repaint Unbroken Road Centre Lines_ 150mm width	Normal	Unit Rate	Line Kms
		Prov. Sum	Fixed Price	Dollars
709	Repaint Double Barrier Line, General	Normal	Unit Rate	Line Kms
710	Repaint Road Edge Lines, Minor	Normal	Unit Rate	Line Kms
711	Repaint Road Edge Lines, Major	Normal	Unit Rate	Line Kms
712	Repaint Edge Line – 100 mm Width	Normal	Unit Rate	Line Kms

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
713	Repaint Edge Line – 150 mm Width	Normal	Unit Rate	Line Kms
714	Repaint Unbroken Lane Line, General	Normal	Unit Rate	Line Kms
719	Repaint Single Barrier Line, General	Normal	Unit Rate	Line Kms
720	Repaint Single Broken Lines	Normal	Unit Rate	Line Kms
721	Repaint Barrier Broken Lines	Normal	Unit Rate	Line Kms
722	Repaint Broken Lane Line, General	Normal	Unit Rate	Line Kms
723	Repaint Continuity Line, General	Normal	Unit Rate	Line Kms
724	Repaint 150 mm Outline, General	Normal	Unit Rate	Line Kms
725	Repaint 150mm Outline – General	Normal	Unit Rate	Line Kms
729	Urban Line Marking - Minor	Normal	Unit Rate	m ²
		Prov. Sum	Fixed Price	Dollars
730	Repaint Lateral Markings	Normal	Unit Rate	m ²
		Prov. Sum	Fixed Price	Dollars
731	Remark Road Markings	Normal	Unit Rate	m ²
735	Thermoplastic Line Marking	Normal	Unit Rate	m ²
736	Audiotactile Linemarking	Normal	Unit Rate	Line Kms
740	Raised Pavement Markers	Normal	Unit Rate	Each (Marker)
745	Remove Unwanted Road Lines	Normal	Unit Rate	Line Kms
750	Remove Unwanted Markings	Normal	Unit Rate	m ²
		Prov. Sum	Fixed Price	Dollars
759	Line Marking, General	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
760	Pavement New Lateral Markings, Bikeways	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
770	Retro Reflectivity Testing	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
800	Structures			
809	Routine Bridge Servicing (RAMC)	Normal	Unit Rate	Linear 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 Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
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	Linear 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 ²
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 ³
		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
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 ²

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
876	Footway deck wearing surface repairs (Manual or Mechanical)	Normal	Unit Rate	Tonnes
877	Repair scouring/deposition of waterway material	Normal	Unit Rate	m ³
		Prov. Sum	Fixed Price	Dollars
878	Remove flood debris from waterways	Normal	Unit Rate	m ³
879	Maintain clear waterways	Prov. Sum	Fixed Price	Dollars
880	Repair Roadside Fences	Normal	Unit Rate	Linear Metres
		Prov. Sum	Fixed Price	Dollars
882	Maintain existing waterway protection	Normal	Unit Rate	m ²
		Prov. Sum	Fixed Price	Dollars
883	Seal gaps between culvert elements/wingwalls	Normal	Unit Rate	Linear Metres
		Prov. Sum	Fixed Price	Dollars
884	Repair handrail/barrier/guardrail furniture	Normal	Unit Rate	Linear Metres
		Prov. Sum	Fixed Price	Dollars
885	Make safe accident damage to handrail/barrier/guardrail furniture	Prov. Sum	Fixed Price	Dollars
886	Install / Maintain bird control fencing	Normal	Unit Rate	m ²
		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 ²
		Prov. Sum	Fixed Price	Dollars
889	Emergency pavement repairs on structures (< 10 m ²)	Normal	Unit Rate	m ²
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
899	Other Miscellaneous Structure Work	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars
900	Overheads			
901	RMPC Joint Maintenance Requirement Assessment	Normal	Lump Sum	Dollars
		Prov. Sum	Fixed Price	Dollars

MAINTENANCE ACTIVITY Symbol & Description		Work Type	Payment Type	ACTIVITY Payment Unit of Measure
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 per year per contract organisation)	Normal	Lump Sum	Dollars

5.3 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 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
- 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>Bitumen Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	<i>Premix Asphalt</i>
SS	<i>Shoulder Gravel</i>

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
101	Edge Repair (Manual)	Tonnes

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year -2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading of Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year
Horizontal Straightedge	
Transverse	2/lot min
Longitudinal Alignment	1/lot min
Max 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. Mechanical - more than approximately 20 m continuous lengths.
8. Note if line marking will be required. Schedule another Activity.
9. Specify that 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 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 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 TRPM's 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
- 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 Bitumen Emulsion Surfacing</i>
MRTS21	<i>Bitumen Emulsion</i>

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

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
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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
102	Edge Repair (Mechanical)	Tonnes

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Establishment/disestablishment of paver and paving gang at paving site	each
955110	Preparation of existing surface	m ²
955020	Tack Coat l/m ²	litre
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne
955870	Dense Graded Asphalt pavement, 20 mm mix	tonne
	Cold-mixed asphalt pavement	tonne

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading of Asphalt Q308A or Q308	<200t/source/year-2 /source/year >200t/source/year-4/source/year
Horizontal Straightedge	
Transverse	2/lot min
Longitudinal Alignment	1/lot min
Max 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. 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.
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>Bitumen 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. 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 ± 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
102	Edge Repair with Emulsion/Aggregate	m ³ (loose)

Testing Requirements

Minimum test frequency	
Aggregate	
Aggregate – 10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t

Minimum test frequency	
Horizontal Straightedge	
Transverse	2/lot min
Longitudinal Alignment	1/lot min
Max 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. Major - 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 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 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 - 142 or a more permanent repair – 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
- 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>Bitumen Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	<i>Premix Asphalt</i>

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.

No loose material shall be left on sealed carriageway.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
105	Pothole Patching	Tonnes

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading of Asphalt Q308A or Q308	<200t/source/year-2 /source/year >200t/source/year-4/source/year
Horizontal Straightedge	
Horizontal Straightedge	2 per lot min
Max 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
 - 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.
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>Bitumen 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. 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 ± 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 TRPM's and/or Spotting if required

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
106	Pothole Patching with Emulsion/Aggregate	m ³ loose

Testing Requirements

Minimum test frequency	
Aggregate	
Aggregate – 10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Horizontal Straightedge	
Horizontal Straightedge	2 per lot min
Max 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

Emulsion to MRTS21

TRPMs/paint

Manpower Requirements

Leading hand	1
Labourer	1
Truck driver	1
Traffic controllers	2

Average Daily Production

4 m³ (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.
 - 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.
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
 - d. vehicle position.
2. Determine the work area:
 - a. should be marked out already.
3. Remove all loose and cracked material from within the edgebreak and around the pothole edges:
 - a. joint face at least 15 mm deep
 - b. clean face and base
 - c. solid base.
4. Tack coat the sides and bottom with emulsion:
 - a. light, even coat
 - b. avoid pooling
 - 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 standard.
8. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 m².

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
- 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>Bitumen Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	<i>Premix Asphalt</i>

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 ± 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
107	Heavy Patching	Tonnes

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Establishment/disestablishment of paver and paving gang at paving site	each
955810	Preparation of existing surface	m ²
955820	Tack Coat l/m ²	litre
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne
955870	Dense Graded Asphalt pavement, 20 mm mix	tonne
	Cold-mixed asphalt pavement	tonne

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading of Asphalt Q308A or Q308C	<200t/source/year-2 /source/year >200t/source/year-4/source/year
Horizontal Straightedge	
Horizontal Straightedge	2/lot min
Max 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.
 - 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.
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 linear metres per 1 kilometre

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
- 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>Bitumen Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	<i>Premix Asphalt</i>

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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
110	Surface Correction with Premix/Asphalt (Manual)	Tonnes

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
955810	Preparation of existing surface	m ²
955820	Tack Coat l/m ²	litre
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne
955870	Dense Graded Asphalt pavement, 20 mm mix	tonne
	Cold-mixed asphalt pavement	tonne

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading of Asphalt Q308A or Q308C	<200t/source/year-2 /source/year >200t/source/year-4/source/year
Horizontal Straightedge	
Horizontal Straightedge	1 per 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 m² in isolated areas. Mechanical - more than approximately 10 m² 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.
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 linear metres per 1 kilometre

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 TRPM's 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
- notification to the Principal of linemarking 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 Bitumen Emulsion Surfacing</i>
MRTS21	<i>Bitumen Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>

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

Restoration Standards

As per Applicable Specifications above.

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

Install TPRM in 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
111	Surface Correction with Premix/Asphalt (Mechanical)	Tonnes

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Establishment/disestablishment of paver and paving gang at paving site	each
955810	Preparation of existing surface	m ²
955820	Tack Coat l/m ²	litre
955850	Dense Graded Asphalt pavement, 10 mm mix	tonne
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne
955070	Dense Graded Asphalt pavement, 20 mm mix	tonne
	Cold-mixed asphalt pavement	tonne

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading of Asphalt Q308A or Q308C	<200t/source/year-2 /source/year >200t/source/year-4/source/year
Temperature at time of rolling commencement	6 per lot
Horizontal Straightedge	
Horizontal Straightedge	1 per 10 m
Maximum lot size	One day

Minimum test frequency	
Asphalt/Premix Aggregate	
Aggregate -10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Polished Aggregate Friction Value Q203	1 per 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 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 m² in *isolated areas*.
Mechanical - more than approximately 10 m² in one area.
8. Note if road marking will be required. Schedule another Activity.
9. Consider sub-contracting options.
10. Specify the appropriate plant, materials and crew (including quantities of material) and organise these.
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 linear metres per 1 kilometre

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>Bitumen 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. 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 ± 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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
112	Surface Correction with Emulsion/Aggregate	m ³ loose

Testing Requirements

Minimum test frequency	
Aggregate	
Aggregate – 10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Horizontal Straightedge	
Horizontal Straightedge	2 per lot min
Max 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

Emulsion to MRTS21

TRPMs/paint

Manpower Requirements

Leading hand	1
Labourer	1
Truck driver	1
Traffic controllers	2

Average Daily Production

4 m³ (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 m² isolated area. Major - more than approximately 10 m in one area.
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 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
 - 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
 - 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 standard.
8. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 linear metres per 1 kilometre

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 & 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. 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.
- the supply and installation of TRPM's 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
- notification to the Principal of linemarking 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 Bitumen Emulsion Surfacing</i>
MRTS21	<i>Bitumen Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>
SS	<i>Premix Asphalt</i>

Restoration Standards

For Emulsion / Aggregate:

As per Applicable Specifications above.

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

Install TPRM in 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 ± 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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

For Asphalt:

Item	Description	Unit of Measurement
111	Surface Correction with Premix/Asphalt (Mechanical)	Tonnes

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Establishment/disestablishment of paver and paving gang at paving site	each
955810	Preparation of existing surface	m ²
955820	Tack Coat l/m ²	litre
955850	Dense Graded Asphalt pavement, 10 mm mix	tonne
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne
955070	Dense Graded Asphalt pavement, 20 mm mix	tonne
	Cold-mixed asphalt pavement	tonne

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading of Asphalt Q308A or Q308C	<200t/source/year-2 /source/year >200t/source/year-4/source/year
Temperature at time of rolling commencement	6 per lot
Horizontal Straightedge	
Horizontal Straightedge	1 per 10 m
Maximum lot size	One day
Asphalt /Premix Aggregate	
Aggregate 10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Polished Aggregate Friction Value Q203	1 per 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 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 m² in *isolated areas*.
Mechanical - more than approximately 10 m² in one area.
8. Note if road marking will be required. Schedule another Activity.
9. Consider sub-contracting options.
10. Specify the appropriate plant, materials and crew (including quantities of material) and organise these.

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	Unit of Measurement
112	Surface Correction with Emulsion/Aggregate	m ³ loose

Testing Requirements

Minimum test frequency	
Aggregate	
Aggregate – 10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Horizontal Straightedge	
Horizontal Straightedge	2 per lot min
Max 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

Emulsion to MRTS21

TRPMs/paint

Manpower Requirements

Leading hand	1
Labourer	1
Truck driver	1
Traffic controllers	2

Average Daily Production

4 m³ (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 m² isolated area. Major - more than approximately 10 m in one area.
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 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
 - 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

- 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 standard.
8. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 linear metres per 1 kilometre)

Description

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

Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS11	<i>Sprayed Bituminous Surfacing (excluding emulsion)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
114	Surface Enrichment	m ²

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
956500	Enrichment (Class, rate, l/m ²)	litre
956600	Spreading cover aggregate (Size mm, rate 1m ³ / m ²)	m ³
958100	Supply of cover aggregate (mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170)	tonne
956910	Supply of material (Bitumen Emulsion) (Type)	tonne
956920	Supply of material (Bitumen Cutter)	tonne

Testing Requirements

Minimum test frequency	
Bitumen -sample	1 per tank
Application Rates - Spraying Records. Max. lot size:	1 day

If cover aggregate is used, testing requirements shall be as detailed for cover aggregate under Activity No. 161, Reseal.

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

Bitumen to MRTS17

Bitumen emulsion to MRTS21

Cutter to MRTS19

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 m²

> 3000 l sprayer 9000 m²

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.
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
 - 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

- 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
 - c. spray evenly at specified rate.
- 8. Apply cover material:
 - a. use spreaders at specified rate.
- 9. Check the work against restoration standard.
- 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
 - c. notify supervisor if line marking required.
- 12. Remove traffic control:
 - a. use sealing signs if needed
 - b. clean/repair as necessary.
- 13. Complete the spray sheets.

115 Surface Enrichment – Minor (≤ 150 linear metres per 1 kilometre)

Description

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

Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS11	<i>Sprayed Bituminous Surfacing (excluding emulsion)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen Emulsion</i>

Reference	Title
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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
115	Surface Enrichment	m ²

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
956500	Enrichment (Class, rate, l/m ²)	litre
956600	Spreading cover aggregate (Size mm, rate 1m ³ / m ²)	m ³
958100	Supply of cover aggregate (mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170)	tonne
956910	Supply of material (Bitumen Emulsion) (Type)	tonne
956920	Supply of material (Bitumen Cutter)	tonne

Testing Requirements

Minimum test frequency	
Bitumen -sample	1 per tank
Application Rates - Spraying Records. Max. lot size:	1 day

If cover aggregate is used, testing requirements shall be as detailed for cover aggregate under Activity No. 161, Reseal.

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
Bitumen	to MRTS17
Bitumen emulsion	to MRTS21
Cutter	to MRTS19
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 m²

> 3000 l sprayer 9000 m²

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.
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
 - 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
 - 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
 - c. spray evenly at specified rate.
8. Apply cover material:
 - a. use spreaders at specified rate.
9. Check the work against restoration standard.
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
 - c. notify supervisor if line marking required.
12. Remove traffic control:
 - a. use sealing signs if needed
 - b. clean/repair as necessary.

13. Complete the spray sheets.

117 Reseal – Major (≥150 linear metres per 1 kilometre)

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 TRPM's or line spotting as required
- all other operations in the Applicable Specifications (i.e. MRS & MRTS 02, 11, .22 etc.) 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
- notification to the Principal of linemarking 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 Surfacing (excluding emulsion)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
117	Reseal	m ²

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
956400	Reseal (Class, rate, l/m ²)	litre
956600	Spreading cover aggregate (Size mm, rate 1m ³ / m ²)	m ³
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m ³
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m ³
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170)	tonne
956910	Supply of material (Modified Bitumen Class 170 + 3% SBS Polymer)	tonne
956920	Supply of material (Bitumen Cutter)	tonne
956930	Supply of material (Adhesion Agent)	kg

Testing Requirements

Minimum test frequency	
Cover Aggregate	
Aggregate – 10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Modified Tray Test Q219	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Bitumen -sample	1 per 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.

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.
12. Check for overhead wires that could catch tip trucks.

118 Seal Coating (Minor) - < 150 linear metres per 1 kilometre

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 and MRTS22
- 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 TRPM's 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
- notification to the Principal of linemarking 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 Surfacing (excluding emulsion)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 TRPM's and/or spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
118	Seal Coating (Minor)	m ²

Testing Requirements

Minimum test frequency	
Cover Aggregate	
Aggregate – 10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year

Minimum test frequency	
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Bitumen -sample	1 per 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.
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 and MRTS22
- 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 TRPM's 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
- notification to the Principal of linemarking 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 Surfacing (excluding emulsion)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 TRPM's and/or spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
119	Surface Correction (Skid Resistance)	m ²

Testing Requirements

Minimum test frequency	
Cover Aggregate	
Aggregate – 10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Bitumen -sample	1 per 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.
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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
120	Fill Cracks	Litres

Testing Requirements

Minimum test frequency	
Horizontal straightedge	1 per 10 metres

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 litres - 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.
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
 - 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
 - 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
 - c. clean any excess from the surface.
5. Apply crack sealant:
 - a. follow the manufacturer's instructions
 - b. use safety equipment and clothing

- c. check HAZCEM code.
- 6. Apply cover material:
 - a. dry cover material
 - b. sealant is lightly and evenly covered.
- 7. Check the work against the restoration standard.
- 8. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains
 - 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>Bitumen 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. 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 ± 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
121	Crack Treatment with Emulsion/Aggregate	m ³

Testing Requirements

Minimum test frequency	
Aggregate	
Aggregate – 10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Horizontal Straightedge	2/lot min
Max. lot size	1 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
 - 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
 - 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 standard.
8. Leave work site safe and tidy:
 - a. remove all loose material
 - 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
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 Surfacing (excluding emulsion)</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS22	<i>Supply of Cover Aggregate</i>

Restoration Standard

As per Applicable Specifications above.

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

Install TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
122	Crack Treatment with Strain Alleviating Product	m ²

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
912100	Provision for traffic	Provision for traffic
956400	Reseal (Class, rate, .l/m ²)	m ²
956600	Spreading cover aggregate (Size.mm, rate.1m ³ /m ²)	m ³
958100	Supply of cover aggregate (precoated/un-precoated) (mm nominal size)	m ³

Testing Requirements

Minimum test frequency	
Cover Aggregate	
Aggregate – 10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Polymer-modified bitumen -sample	1 per 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
Bitumen	to MRTS17
Cutter	to MRTS19
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

Expected Daily Production

< 3000 l sprayer 5000 m²

> 3000 l sprayer 9000 m²

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.
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
 - 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
 - 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
 - c. spray evenly at specified rate.
8. Apply cover material:
 - a. use spreaders at specified rate.
9. Check the work against restoration standard.
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
 - c. notify supervisor if line marking required.
12. Remove traffic control:
 - a. use sealing signs if needed
 - 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 manufacturers specification
- the supply and installation of TRPM's or linespotting 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
- notification to the Principal of linemarking 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 TPRM in and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
123	Surface Strip Treatment of Cracks	linear metres

Testing Requirements

Minimum test frequency	
Straightedge	1 per 10 metres

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.
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 Pavements</i>

Where specified in the Works Order, the joint shall be routed and the side walls liquid/air blasted as specified in MRTS40 and/or shown on the Works 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 Works Order.

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

The joint shall be sealed as specified in MRTS40 and/or shown on the Works Order.

Restoration Standards

The joint shall be filled along its full length.

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
124	Concrete Joint and Cracks Treatment	linear metres

Testing Requirements

Minimum test frequency	
Straightedge	1 per 10 metres

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.
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
 - 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
 - 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
 - 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

- j. sealant lightly and evenly covered.
- 7. Check the work against the restoration standard.
- 8. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains
 - 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 Specification

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

Restoration Standards

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
125	Stitch Treat Cracks in Concrete Roads	linear 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.
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
 - 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 works 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
 - f. check HAZCEM code.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains.
6. Remove traffic control:
 - a. clean/repair as necessary.

126 Replacement of Concrete Joint Sealant**Description**

Remove existing joint sealant, clean joint and replace.

Applicable Specification

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

Restoration Standards

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
126	Replacement of Concrete Joint Sealant Dollars in Concrete Roads	linear 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.
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
 - 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 manufacturers specification
 - c. ensure adequate drying time is allowed.
 - d. check HAZCEM code.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 (ie there is a presence of other defects such as cracking, lifting, etc) should be carried out under a different Activity (e.g. Activity 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
- 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>Bitumen Emulsion</i>
MRTS30	<i>Asphalt Pavements</i>
SS	<i>Premix Asphalt</i>

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.

No loose material shall be left on sealed carriageway.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
127	Concrete Pothole Patching	Tonnes

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading of Asphalt Q308A or Q308C	<200t/source/year-2 /source/year >200t/source/year-4/source/year

Minimum test frequency	
Horizontal Straightedge	
Horizontal Straightedge	2 per lot min
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;
 - 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.
8. Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.

128 **Jacking of Concrete Slab**

Description

Lifting of sunken concrete slabs to realign with adjacent road surface.

Applicable Specification

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

Restoration Standards

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
128	Jacking of Concrete Slab Dollars in Concrete Roads	linear metre

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.
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
 - d. vehicle position.
2. Determine slabs to be jacked:
 - a. from supervisor's instructions.
3. Jack existing slab:
 - a. drill through slab
 - b. inject mortar / limestone mix.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material

- b. no material to block drains.
- 6. Remove traffic control:
 - a. clean/repair as necessary.

129 Pavement Repairs, Concrete (Mechanical) – Minor (500sq.m)

Description

The repair by machine of concrete surfacing of size less than 500 m² 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
- 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 TRPM's 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

- notification to the Principal of linemarking 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS21	<i>Bitumen Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>
MRTS39	<i>Lean Mix Concrete Subbase for Pavements</i>
MRTS40	<i>Concrete Pavement Base</i>
MRTS70	<i>Concrete</i>
MRTS71	<i>Reinforcing Steel</i>
MRTS71A	<i>Stainless Steel Reinforcing</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, Retaining Structures and Protective Treatments*.

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.

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 Standard

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 TRPM's 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
129	Pavement Repairs, Concrete (Mechanical) – Minor (< 500 m ²)	m ²

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.
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 < 1m² 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 m²) will generally be undertaken using an alternative Activity (e.g. 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 Specification 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
- 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 Specification provides additional requirements for compliance.

Applicable Specification

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
130	Surface Sweeping	m ²

Testing Requirements

None listed

Particular Planning Points to Consider

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

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 Specification

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 Item and Unit of Measurement

Item	Description	Unit 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.
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
 - 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 standard.
6. Remove traffic control:
 - a. clean/repair as necessary.

137 Rut Correction- Minor (< 100 metres per 1 km)

Description

The of 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 sub grade 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 and MRS22
- 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 TRPM's 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 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS21	<i>Bitumen 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 stock pile sites unless otherwise agreed.

Restoration Standard

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

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

Install TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
137	Rut Correction – Minor (< 100 m per 1 km) (Mechanical)	m ²

No other details are listed in the Standard for this Activity.

138 Rut Correction- Major (≥ 100 metres per 1 km)**Description**

The of 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 sub grade 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 and MRS22
- 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 TRPM's 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 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>

Reference	Title
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS21	<i>Bitumen 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 stock pile sites unless otherwise agreed.

Restoration Standard

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

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

Install TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
138	Rut Correction – Minor (≥ 100 m per 1 km) (Mechanical)	m ²

No other details are listed in the Standard for this Activity.

139 Other Bituminous Surface Work

Description

Work carried out on the bituminous roadway surface not covered by Activities numbered 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 Item and Unit of Measure

Item	Description	Unit of Measurement
139	Other Bituminous Surface Work	Dollars

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

140 Pavement Repairs (Manual)

Description

The repair by hand of shoving pavement or asphalt surfacing (less than 1 m² 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>

Reference	Title
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS21	<i>Bitumen 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, Retaining Structures and Protective Treatments*.

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 Standard

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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
140	Pavement Repairs (Manual)	m ²

Testing Requirements

Minimum test frequency	
Unbound Pavements and materials for stabilisation	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Flakiness Index Q201B	1/source/year
CBR Q113A	1/source/year

Minimum test frequency	
Degradation Factor Q208B	1/source/year
Grading Q103A	1/250 m ³
Liquid Limit Q104A	1/250 m ³
Plastic Limit, Q105	1/250 m ³
Linear Shrinkage Q106	1/250 m ³
Stabilised Material-Drying/Shrinkage Q128	1/source/year
Cement Content Q116B	1 per 100 m ³
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	200t/source/year-2/source/year >200t/source/year-4/source/year
Asphalt Aggregate	
10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400t
Flakiness Index Q201B	1 per 400t
Polished Aggregate Friction Value Q203	1 per 400t
Geometrics	
Horizontal Straightedge	1 each repair in wheel path and at interface
Depth below Road Surface	1 per layer each repair
Cover Aggregate	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217F	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201D	1 per 400 t
Precoating Q216	1 per 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
Precoated screenings	to MRTS22
Bitumen	to MRTS17
Emulsion	to MRTS17
Asphalt	to MRTS30
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.

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
 - 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
 - f. truck excavated material to site specified by your supervisor.
4. Compact the Base:
 - a. the compactor makes no more impressions
 - 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
 - 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
 - c. allow surface to dry.
8. Apply seal or asphalt surfacing:
 - a. use Activity Number 128, steps 5 to 12. or Activity Number 138, Steps 4 to 7.

9. Check the work against the restoration standard.
10. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains
 - c. notify supervisor if line marking required.
11. Re-establish linemarking:
 - a. use TRPMs 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 and MRS22
- 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 TRPM's 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 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 Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Cutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 stock pile sites unless otherwise agreed.

Restoration Standard

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

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

Install TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
141	Temporary Pavement Repairs (Mechanical)	m ²

No other details are listed in the 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 TRPM's or linespotting 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
- notification to the Principal of linemarking 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 Pavement</i>
MRTS30	<i>Asphalt Pavements</i>
SS	<i>Premix Asphalt</i>

Restoration Standards

The finished surface shall be within ± 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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
142	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.
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 m² 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
- 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 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

- notification to the Principal of linemarking 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavement</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>

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

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

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 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 Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
143	Pavement Repairs Gravel (Mechanical) – Minor (500 m ²)	m ²

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
942100	Road excavation, all material	m ³
	Geotextiles on/under subgrade	m ²
933300	Subsoil drains, Type C	m

Supplementary Work Item	Description	Unit of Measurement
933400	Subsoil drains, Type D	m
	Plant-mix stabilised pavement (incl. cement and curing)	m ³
	Subbase, Unbound Pavement Type.(Subtype)	m ³
	Base, Unbound Pavement Type.(Subtype)	m ³

Testing Requirements

Minimum test frequency	
Unbound Pavements and materials for stabilisation	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Flakiness Index Q201B	1/source/year
CBR Q113A	1/source/year
Degradation Factor Q208B	1/source/year
Grading Q103A	1 per 250 m ³
Liquid Limit Q104A	1 per 250 m ³
Plastic Limit, PI Q105	1 per 250 m ³
Linear Shrinkage Q106	1 per 250 m ³
Stabilised Material	
Drying/Shrinkage Q128	1/source/year
Cement Content Q116B	1 per 100 m ³
Compaction - Earthworks, Unbound/Stabilised Pavement	
MDR Q110A	1 per 500 m ²
MDR Q110C (Cement treated)	1 per 500 m ²
Density Q111A or Q112	1 per 500 m ²
Asphalt	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year

Minimum test frequency	
Geometrics	
Horizontal Straightedge (min 1/patch in wheel path and at interface)	1 per 10 m
Depth below Road Surface	1 per 10m per layer
Cover Aggregate	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 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.
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 146. To including 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 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
- 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavement</i>
MRTS07A	<i>In situ stabilized Subgrades using quick lime or hydrated lime</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS57	<i>Geotextiles for Paving Applications</i>

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

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

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 MRTS05 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 stock pile sites unless otherwise agreed.

Restoration Standard

The finished work shall meet the requirements of the relevant specifications except as provided here under.

Activity Item and Unit of Measurement

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

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
942100	Road excavation, all material	m ³
	Geotextiles on/under subgrade	m ²
	Rockfill	m ³
933300	Subsoil drains, Type C	m
933400	Subsoil drains, Type D	m
	Plant-mix stabilised pavement (incl. cement and curing)	m ³
	Subbase, Unbound Pavement Type.(Subtype)	m ³
	Base, Unbound Pavement Type.(Subtype)	m ³
955020	Tack Coat l/m ²	litre
	Establishment/disestablishment of paver and paving gang at paving each site	site

Testing Requirements

Minimum test frequency	
Unbound Pavements and materials for stabilisation	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year

Minimum test frequency	
Flakiness Index Q201B	1/source/year
CBR Q113A	1/source/year
Degradation Factor Q208B	1/source/year
Grading Q103A	1 per 250 m ³
Liquid Limit Q104A	1 per 250 m ³
Plastic Limit, PI Q105	1 per 250 m ³
Linear Shrinkage Q106	1 per 250 m ³
Stabilised Material	
Drying/Shrinkage Q128	1/source/year
Cement Content Q116B	1 per 100 m ³
Compaction - Earthworks, Unbound/Stabilised Pavement	
MDR Q110A	1 per 500 m ²
MDR Q110C (Cement treated)	1 per 500 m ²
Density Q111A or Q112	1 per 500 m ²

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 m²), 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

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS05	<i>Unbound Pavement</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 Standard

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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
145	Scarify and Reshape Existing Pavement	m ²

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Scarify and Reshape Existing Pavement	m ²
	Base, Unbound Pavement Type	m ³
955320	Tack Coat l/m ²	litre
	Establishment/disestablishment of paver and paving gang at paving site	each
	Dense Graded Asphalt pavement, 10 mm mix	tonne
956100	Prime (Grade, rate.l/m ²)	litre
956200	Primerseal (Grade, rate.l/m ²)	litre
956300	Seal (Class, rate.l/m ²)	m ²
956600	Spreading prime cover aggregate (Size.mm, rate.1m ³ /m ²)	m ³
956700	Spreading cover aggregate (Size.mm, rate.1m ³ /m ²)	m ³
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m ³
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m ³

Supplementary Work Item	Description	Unit of Measurement
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170)	tonne
956910	Supply of material (Modified Bitumen Class 170 + % SBS Polymer)	tonne
956920	Supply of material (Bitumen Cutter)	tonne
956930	Supply of material (Adhesion Agent)	kg

Testing Requirements

Minimum test frequency	
Unbound Pavements	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Flakiness Index Q201B	1/source/year
CBR Q113A	1/source/year
Degradation Factor Q208B	1/source/year
Grading Q103A	1 per 250 m ³
Liquid Limit Q104A	1 per 250 m ³
Plastic Limit, PI Q105	1 per 250 m ³
Linear Shrinkage Q106	1 per 250 m ³
MDR Q110A	1 per 500 m ²
Density Q111A or Q112	(1 per lot min:)
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year
Temperature at time of rolling commencement	6 per lot min
Asphalt/Premix Aggregate	
10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t

Minimum test frequency	
Polished Aggregate Friction Value Q203	1 per 400 t
Geometrics	
Horizontal Straightedge	1 per 10 m
Depth below Road Surface	1 per 10 m per layer
Cover Aggregate	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Bitumen - sample	1 per tank
Bitumen emulsion sample	1 per 5000 litres
Application Rates	
Spraying Records. Max. 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

Precoated screenings to MRTS22

Asphalt	to MRTS30
Bitumen	to MRTS17
Emulsion	to MRTS21
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.
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
 - 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
 - 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
 - c. check compaction.
5. Form the surface:
 - a. use grader, water and roller
 - b. check against the standard
 - c. allow surface to dry.
6. Apply seal or asphalt surfacing:
 - a. use Activity Number 128, steps 5 to 12. or Activity Number 136, Steps 4 to 8.
7. Check the work against the restoration standard.
8. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains
 - c. notify supervisor if line marking required.
9. Re-establish linemarking:
 - a. use TRPMs or spotting.
10. Remove traffic control:
 - a. clean/repair as necessary.

146 Pavement Repairs Asphalt (Mechanical) Minor (< 500 m²)

Description

The repair by machine of shoving pavement or asphalt surfacing of size less than 500 m² 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 m² are covered by Activity No. 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
- 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 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 profilers 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 TRPM's 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
- notification to the Principal of linemarking 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavement</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 the Department of Transport and Main Roads.

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

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 Standard

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 TRPM's 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
146	Pavement Repairs Asphalt (Mechanical) – Minor (< 500 m ²)	m ²

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
942100	Road excavation, all material	m ³
	Geotextiles on/under subgrade	m ²
933000	Subsoil drains, Type C	m
933400	Subsoil drains, Type D	m
	Plant-mix stabilised pavement (incl. cement and curing)	m ³
	Subbase, Unbound Pavement Type (Subtype)	m ³
	Base, Unbound Pavement Type (Subtype)	m ³
955020	Tack Coat l/m ²	litre
	Establishment/disestablishment of paver and paving gang at paving site	each
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne
956100	Prime (Grade, rate l/m ²)	litre
956200	Primerseal (Grade, rate l/m ²)	litre
956300	Seal (Class, rate l/m ²)	litre
956600	Spreading prime cover material (Size mm, rate.1m ³ / m ²)	m ³
956700	Spreading cover aggregate (Size mm, rate 1 m ³ / m ²)	m ³
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m ³
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m ³
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170)	tonne
956910	Supply of material (Modified Bitumen Class 170 + % SBS Polymer)	tonne
956920	Supply of material (Bitumen Cutter)	tonne

Supplementary Work Item	Description	Unit of Measurement
956930	Supply of material (Adhesion Agent)	kg

Testing Requirements

Minimum test frequency	
Unbound Pavements	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Flakiness Index Q201B	1/source/year
CBR Q113A	1/source/year
Degradation Factor Q208B	1/source/year
Grading Q103A	1 per 250 m ³
Liquid Limit Q104A	1 per 250 m ³
Plastic Limit, PI Q105	1 per 250 m ³
Linear Shrinkage Q106	1 per 250 m ³
Stabilised Material	
Drying/Shrinkage Q128	1/source/year
Cement Content Q116B	1 per 100 m ³
Compaction – Earthworks, Unbound/Stabilised Pavement	
MDR Q110A	1 per 500 m ²
MDR (Cement treated) Q110C	1 per 500 m ²
Density Q111A or Q112	1 per 500 m ²
Asphalt	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year
Temperature at time of rolling commencement	6 per lot min
Asphalt Aggregate	
10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Polished Aggregate Friction Value Q203	1 per 400 t

Minimum test frequency	
Geometrics	
Horizontal Straightedge (min 1/patch in wheel path and at interface)	1 per 10 m
Depth below Road Surface	1 per 10 m per layer
Cover Aggregate	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Bitumen - sample	1 per tank
Bitumen emulsion sample	1 per 5000 litres
Application Rates	
Spraying Records. Max. 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.
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 m² 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 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
- 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavement</i>

Reference	Title
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 the Department of Transport and Main Roads.

Geotextiles on/under subgrade shall comply with the requirements specified for geotextiles under/within embankments in MRS03 *Drainage, Retaining Structures and Protective Treatments*.

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 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 stock pile sites unless otherwise agreed.

Restoration Standard

The finished work shall meet the requirements of the relevant specifications except as provided here under.

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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
147	Pavement Repairs Gravel (Mechanical) – Major (in place)	m ³

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
942100	Road excavation, all material	m ³
	Geotextiles on/under subgrade	m ²
	Rockfill	m ³
933000	Subsoil drains, Type C	m
933400	Subsoil drains, Type D	m
	Plant-mix stabilised pavement (incl. cement and curing)	m ³
	Subbase, Unbound Pavement Type (Subtype)	m ³
	Base, Unbound Pavement Type (Subtype)	m ³

Testing Requirements

Minimum test frequency	
Unbound Pavements and materials for stabilisation	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Flakiness Index Q201B	1/source/year
CBR Q113A	1/source/year
Degradation Factor Q208B	1/source/year
Grading Q103A	1 per 250 m ³
Liquid Limit Q104A	1 per 250 m ³
Plastic Limit, PI Q105	1 per 250 m ³
Linear Shrinkage Q106	1 per 250 m ³
Stabilised Material	
Drying/Shrinkage Q128	1/source/year
Cement Content Q116B	1 per 100 m ³
Compaction – Earthworks, Unbound/Stabilised Pavement	
MDR Q110A	1 per 500 m ²
MDR (Cement treated) Q110C	1 per 500 m ²
Density Q111A or Q112	1 per 500 m ²
Geometrics	
Horizontal Straightedge (min 1/patch in wheel path and at interface)	1 per 10 m
Depth below Road Surface	1 per 10 m per 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.
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 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 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 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 profilers 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 TRPM's 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
- notification to the Principal of linemarking 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavement</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 Main Roads.

Geotextiles on/under subgrade shall comply with the requirements specified for geotextiles under/within embankments in MRS03 *Drainage, Retaining Structures and Protective Treatments*.

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 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 stock pile sites unless otherwise agreed.

Restoration Standard

The finished work shall meet the requirements of the relevant specifications except as provided here under.

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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
148	Pavement Repairs Asphalt (Mechanical) – Major (in place)	m ³

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
942100	Road excavation, all material	m ³
	Geotextiles on/under subgrade	m ²
	Rockfill	m ³
933000	Subsoil drains, Type C	m
933400	Subsoil drains, Type D	m
	Plant-mix stabilised pavement (incl. cement and curing)	m ³
	Subbase, Unbound Pavement Type (Subtype)	m ³
	Base, Unbound Pavement Type (Subtype)	m ³
955020	Tack Coat l/m ²	litre

Supplementary Work Item	Description	Unit of Measurement
	Establishment/disestablishment of paver and paving gang at paving each site	site
955860	Dense Graded asphalt pavement, 14mm mix	tonne
956100	Prime (Grade, rate l/m ²)	litre
956200	Primerseal (Grade, rate l/m ²)	litre
956300	Seal (Class, rate l/m ²)	litre
956600	Spreading prime cover material (Size mm, rate 1m ³ / m ²)	m ³
956700	Spreading cover aggregate (Size mm, rate 1m ³ / m ²)	m ³
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m ³
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m ³
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170)	tonne
956910	Supply of material (Modified Bitumen Class 170 + % SBS Polymer)	tonne
956920	Supply of material (Bitumen Cutter)	tonne
956930	Supply of material (Adhesion Agent)	kg

Testing Requirements

Minimum test frequency	
Unbound Pavements and materials for stabilisation	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Flakiness Index Q201B	1/source/year
CBR Q113A	1/source/year
Degradation Factor Q208B	1/source/year
Grading Q103A	1 per 250 m ³
Liquid Limit Q104A	1 per 250 m ³
Plastic Limit, PI Q105	1 per 250 m ³
Linear Shrinkage Q106	1 per 250 m ³

Minimum test frequency	
Stabilised Material	
Drying/Shrinkage Q128	1/source/year
Cement Content Q116B	1 per 100 m ³
Compaction – Earthworks, Unbound/Stabilised Pavement	
MDR Q110A	1 per 500 m ²
MDR (Cement treated) Q110C	1 per 500 m ²
Density Q111A or Q112	1 per 500 m ²
Asphalt/Premix	
Materials/Mix Design Q307	1/source/year
Maximum Density of Asphalt	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year
Temperature at time of rolling commencement	6 per lot min
Asphalt Aggregate	
10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Polished Aggregate Friction Value Q203	1 per 400 t
Geometrics	
Horizontal Straightedge (min 1/patch in wheel path and at interface)	1 per 10 m
Depth below Road Surface	1 per 10 m per layer
Cover Aggregate	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Bitumen - sample	1 per tank
Bitumen emulsion sample	1 per 5000 litres
Application Rates	
Spraying Records. Max. 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.
10. Specify spray seal or asphalt surface. Specify asphalt depth.

151 Gravel Supply - Insitu Stabilisation

Description

The supply of paving material for Activity numbered 150, Insitu Stabilisation. 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
- 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 Pavement</i>

Restoration Standards

Nil (supply only)

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
151	Gravel Supply - Insitu Stabilisation	cubic metres loose

Testing Requirements

Minimum Test Frequency	
Grading Q103A	1/250 m ³
Linear Shrinkage Q106	1/250 m ³
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 numbered 150, Insitu Stabilisation. 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
- 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
152	Gravel Cartage - Insitu Stabilisation	cubic metres loose - kms

Testing Requirements

Nil.

Particular Planning Points to Consider

Nil. Load and Cart only.

153 *Insitu-Stabilisation – Minor (< 500 m²)***Description**

The stabilisation in place of a sub grade or an existing pavement (less than 500 m²) 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 linespotting 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 Works 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
- 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>In Situ Stabilised Pavements using quicklime or Hydrated Lime</i>
MRTS07B	<i>In Situ Stabilised Pavements using Cement or Cementitious Blends</i>
MRTS07C	<i>In Situ Stabilised Pavements using Foamed Bitumen</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

Restoration Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
153	Insitu-Stabilisation	m ³

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
953300	Insitu-Stabilisation	m ³
953600	Supply of stabilisation agent	tonne
953800	Curing Coat l/m ²	litre
953900	Cover Material	m ³
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne
956300	Seal (Class, rate l/m ²)	litre
956700	Spreading cover aggregate (Size.mm, rate.1m ³ /.m ²)	m ³
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m ³

Supplementary Work Item	Description	Unit of Measurement
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m ³
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170)	tonne
956910	Supply of material (Modified Bitumen Class 170 + % SBS Polymer)	tonne
956920	Supply of material (Bitumen Cutter)	tonne
956930	Supply of material (Adhesion Agent)	kg

Testing Requirements

Minimum Test Frequency	
Stabilised Material	
Cement Content Q116B	1 per 100 m ³
Lime Content Q117 Note: Testing for stabilising agent content may be represented by surface spread rate(s) as specified by Clause 1 of Addendum 1 in MRTS07A, B or C	1 per 100 m ³
Compaction	
MDR Q110A	1 per 500 m ²
MDR (Cement treated) Q110C	1 per 500 m ²
Density Q111A or Q112	1 per 500 m ² (1 per lot min.)
Asphalt	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year
Temperature at time of rolling commencement	6/lot min
Asphalt Aggregate	
10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Polished Aggregate Friction Value Q203	1 per 400 t

Minimum Test Frequency	
Geometrics	
Horizontal Straightedge	1 per 10 m
Depth below Road Surface	1 per 10 m per layer
Cover Aggregate	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Bitumen sample	1 per tank
Bitumen Emulsion Sample	1 per 5000 litres
Application Rates – Spraying Records	
Max. 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.
9. Specify spray seal or asphalt surface. Specify asphalt depth.

154 *Insitu-Stabilisation – Major (>500m²)*

Description

The stabilisation in place of a subgrade or an existing pavement (greater than 500 m²) 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 linemarking 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 Works 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
- notification to the Principal of linemarking 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>In Situ Stabilised Pavements using quicklime or Hydrated Lime</i>
MRTS07B	<i>In Situ Stabilised Pavements using Cement or Cementitious Blends</i>
MRTS07C	<i>In Situ Stabilised Pavements using Foamed Bitumen</i>
MRTS11	<i>Sprayed Bituminous Surfacing (Excluding Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

Restoration Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
154	Insitu-Stabilisation	m ³

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
953300	Insitu-Stabilisation	m ³
953600	Supply of stabilisation agent	tonne
953800	Curing Coat l/m ²	litre
953900	Cover Material	m ³
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne
956300	Seal (Class, rate l/m ²)	litre
956700	Spreading cover aggregate (Size.mm, rate.1m ³ /.m ²)	m ³
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m ³
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m ³
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170	tonne
956910	Supply of material (Modified Bitumen Class 170 + % SBS Polymer)	tonne
956920	Supply of material (Bitumen Cutter)	tonne
956930	Supply of material (Adhesion Agent)	kg

Testing Requirements

Minimum Test Frequency	
Stabilised Material	
Cement Content Q116B	1 per 100 m ³
Lime Content Q117 Note: Testing for stabilising agent content may be represented by surface spread rate(s) as specified by Clause 1 of Addendum 1 in MRTS07A, B or C	1 per 100 m ³

Minimum Test Frequency	
Compaction	
MDR Q110A	1 per 500 m ²
MDR (Cement treated) Q110C	1 per 500 m ²
Density Q111A or Q112	1 per 500 m ² (1 per lot min.)
Asphalt	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year
Temperature at time of rolling commencement	6/lot min
Asphalt Aggregate	
10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Polished Aggregate Friction Value Q203	1 per 400 t
Geometrics	
Horizontal Straightedge	1 per 10 m
Depth below Road Surface	1 per 10 m per layer
Cover Aggregate	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Precoating Q216	1 per 400 t
Bitumen sample	1 per tank
Bitumen Emulsion Sample	1 per 5000 litres
Application Rates – Spraying Records	
Max. 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.
9. Specify spray seal or asphalt surface. Specify asphalt depth.

155 Asphalt Overlay – Major (\geq linear metres)

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 and MRTS22
- the supply and application of a bitumen emulsion tack coat– refer to Applicable Specifications
- the supply, laying and compaction of asphalt - refer to Applicable Specification. The type of asphalt may include any of those listed under the materials section for this Activity.
- the supply and installation of TRPM's 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
- notification to the Principal of linemarking 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 Bitumen Emulsion Surfacing</i>
MRTS30	<i>Asphalt Pavements</i>

Restoration Standard

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 TRPM's and/or Spotting as required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
155	Asphalt Overlay – Major (≥linear metres)	tonne

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
955010	Preparation of existing surface	m ²
955320	Tack Coat _l/m ²	litre
955860	Dense Graded asphalt pavement, 14 mm mix	tonne
955870	Dense Graded asphalt pavement, 20 mm mix	tonne
955890	Dense Graded asphalt pavement, 40 mm mix	tonne
955040	Dense Graded asphalt pavement, DG7 mix	tonne
955050	Dense Graded asphalt pavement, DG10 mix	tonne
955060	Dense Graded asphalt pavement, DG14 mix	tonne
955070	Dense Graded asphalt pavement, DG20 mix	tonne
955080	Dense Graded asphalt pavement, DG28 mix	tonne
955150	Low rut Dense Graded asphalt pavement, DG10 mix	tonne
955160	Low rut Dense Graded asphalt pavement, DG14 mix	tonne
955170	Low rut Dense Graded asphalt pavement, DG20 mix	tonne
955450	Open Graded asphalt pavement OG10 mix	tonne
955460	Open Graded asphalt pavement OG14 mix	tonne
	Establishment/disestablishment of paver and paving	each

Supplementary Work Item	Description	Unit of Measurement
	gang at paving site	

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year
Temperature at time of rolling commencement	6 per lot min
Asphalt Aggregate	
10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Polished Aggregate Friction Value Q203	1 per 400 t
Geometrics	
Horizontal	1 per 50 m
Vertical – height or thickness	1 per 20 m
Vertical – straightedge	1 per 20 m
Vertical – surface evenness	1 per 100 m
Max. 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.
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 linear metres)

Description

The excavation of deteriorated asphalt and the restoration to profile with new asphalt in one operation, for asphalt < 75 mm and areas < 1500 m².

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 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 TRPM's 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
- notification to Principal of linemarking 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 Bitumen Emulsion Surfacing</i>

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

Restoration Standard

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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
157	Excavated and Replace Asphalt	tonne

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
912100	Provision for traffic	lump sum
	Excavation of existing surface	m ²
955320	Tack Coat _l/m ²	litre
955860	Dense Graded asphalt pavement, 14 mm mix	tonne
955870	Dense Graded asphalt pavement, 20 mm mix	tonne
955890	Dense Graded asphalt pavement, 40 mm mix	tonne
955040	Dense Graded asphalt pavement, DG7 mix	tonne
955050	Dense Graded asphalt pavement, DG10 mix	tonne
955060	Dense Graded asphalt pavement, DG14 mix	tonne
955070	Dense Graded asphalt pavement, DG20 mix	tonne
955080	Dense Graded asphalt pavement, DG28 mix	tonne
955150	Low rut Dense Graded asphalt pavement, DG10 mix	tonne
955160	Low rut Dense Graded asphalt pavement, DG14 mix	tonne
955170	Low rut Dense Graded asphalt pavement, DG20 mix	tonne
955450	Open Graded asphalt pavement OG10 mix	tonne
955460	Open Graded asphalt pavement OG14 mix	tonne
	Establishment/disestablishment of paver and paving gang at paving site	each

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year
Asphalt Temperature at time of rolling commencement	6/lot min
Asphalt Aggregate	
10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Polished Aggregate Friction Value Q203	1 per 400 t
Geometrics	
Horizontal Straight edge (wheelpath)	1 per 10 m (min 1/patch)
Horizontal Straight edge (interface)	1 per 10 m (min 1/patch)
Depth below roadsurface	1 per 10 m (min 1/patch)
Max. 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.
8. Specify the appropriate plant, materials and crew (including quantities of material) and organise these.

158 Excavate & Replace A/C Wear Surf < 60 mm RAM

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	<i>Recycling Asphalt Pavements</i>

Restoration Standard

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 TRPM's and/or Spotting if required.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
160	Recycling	cubic metres

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
912100	Provision for traffic	lump sum
	Recycling of existing asphalt surface	m ²
955860	Dense Graded asphalt pavement, 14 mm mix	tonne
955870	Dense Graded asphalt pavement, 20 mm mix	tonne
955890	Dense Graded asphalt pavement, 40 mm mix	tonne
955040	Dense Graded asphalt pavement, DG7 mix	tonne
955050	Dense Graded asphalt pavement, DG10 mix	tonne
955060	Dense Graded asphalt pavement, DG14 mix	tonne
955070	Dense Graded asphalt pavement, DG20 mix	tonne
955080	Dense Graded asphalt pavement, DG28 mix	tonne

Supplementary Work Item	Description	Unit of Measurement
955150	Low rut Dense Graded asphalt pavement, DG10 mix	tonne
955160	Low rut Dense Graded asphalt pavement, DG14 mix	tonne
955170	Low rut Dense Graded asphalt pavement, DG20 mix	tonne
	Establishment/disestablishment of paver and paving gang at paving site	each

Testing Requirements

Minimum test frequency	
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	<200t/source/year-2/source/year >200t/source/year-4/source/year
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	<200t/source/year-2/source/year >200t/source/year-4/source/year
Asphalt Temperature at time of rolling commencement	6/lot min
Asphalt Aggregate	
10% Fines Q205B	1/source/year
Crushed Particles Q215	1/source/year
Grading Q103D	1 per 400 t
Flakiness Index Q201B	1 per 400 t
Polished Aggregate Friction Value Q203	1 per 400 t
Geometrics	
Horizontal	1 per 50 m
Vertical – height or thickness	1 per 20 m
Vertical – straightedge	1 per 20 m
Vertical – surface evenness	1 per 100 m
Max. 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

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.
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

- 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
 - b. remove existing 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
 - b. loose depth should be 1.25 times compacted depth.
6. Compact asphalt:
 - a. compact edges first
 - b. use vibrating steel-drum roller
 - c. compact at specified temperature.
7. Finish with multi-tyred roller.
8. Check the work against the restoration standard.
9. Leave work site safe and tidy:
 - a. remove all loose material
 - 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	<i>Cold Planing Pavements</i>

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
161	Profile Planning	m ²

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 sub-contracting options.
9. Specify the appropriate plant, materials and crew (including quantities of material) and organise these.
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
 - 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
 - c. hand excavate around service covers.
4. Remove cut material to disposal site.
5. Check the work against the restoration standard.
6. Leave work site safe and tidy:
 - a. remove all loose material
 - 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

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
169	Other Pavement Work	Dollars

No other details are listed in the Standard for this Activity.

170 Pavement Repairs (RAMC Only)

Details to be advised.

200 UNSEALED SURFACES

201 Light Formation Grading

Description

The light trimming by grader of unsealed formation surface to restore ride ability.

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 light trimming by grader of the existing roadway to fill holes and other depressions.
- all other operations included in the Applicable Specification
- 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/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 Standard

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 Item and Unit of Measurement

Item	Description	Unit 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).
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 re-instatement of roadside furniture (e.g. guide posts, signs etc.) as required.
- the degrading 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 Specification
- 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/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 Standard

The formation crossfall measured using the grader blade or other means shall be within 4% to 6%. Superelevation on curves shall be 4% to 6% also. 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 Works Order.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
202	Medium Formation Grading	km

Testing Requirements

Minimum test frequency	
Crossfall	1 per 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).
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 No. 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 re-instatement of roadside furniture (e.g. guide posts, signs etc.) as required.
- the degrading and tyning of the existing pavement, the incorporation of gravel (supplied to the work site under Activity 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 Specification
- 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/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 Standard

The formation crossfall measured using the grader blade or other means shall be within 4% to 6%. Superelevation on curves shall be 4% to 6% also. 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 Works Order.

The restoration standard of the adjacent surface drainage shall be the same as per Activity No. 305.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
203	Heavy Formation Grading	km

Testing Requirements

Minimum test frequency	
Crossfall	1 per 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.
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, Heavy Formation Grading.

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
- 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	<i>Unsealed Formation Gravel</i>

Restoration Standard

Nil (supply only).

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
204	Gravel Supply - Heavy Formation Grading	Cubic Metres Loose

Testing Requirements

Minimum test frequency	
Grading Q103A	1/250m ³
Linear Shrinkage Q106	1/250m ³
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.
6. Specify and organise appropriate plant, materials and area (including quantities of material).

205 Formation Resheeting –Minor (> 150 lin.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 resheeted formation.
- all other operations included in the Applicable Specification
- 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/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 planned 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 Works 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 Standard

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 Works Order.

The restored pavement layer shall be a minimum depth of 75mm.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
205	Formation Resheeting loose	m ³

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Scarify, shape and compact existing material	m ²
	Base, Unbound pavement Type	m ³

Testing Requirements

Minimum test frequency	
Crossfall	1 per 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.
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 Specification
- 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/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 Works 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 Works 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 Works Order.

Restoration Standard

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 Works Order.

The restored pavement layer shall be a minimum depth of 75mm.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
206	Remove Formation Material and Replace if Required	m ³ loose

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Scarify, shape and compact existing material	m ²
	Base, Unbound pavement Type	m ³

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.
6. Specify and organise appropriate plant, materials and crew (including quantities of material).

207 Formation Mechanical Stabilisation – Minor (> 150 lin.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 Item and Unit of Measure

Item	Description	Unit of Measurement
207	Formation Mechanical Stabilisation	m ³ loose/Dollars

No other details are included in the 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 Standard

The formation shall be graded to fill holes and depressions and smooth loose material.

The surface shall be trafficable for light vehicles.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
208	Accessibility Grading	Km - metre 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?
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions
 - b. remove guide posts and other roadside furniture if needed.
3. Grade the work area to width specified:
 - a. fill holes and depressions
 - b. avoid loss of material from the formation.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. no material to block drains
 - 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 Activities numbered, 201, 202, 203, 204, 205, 206, 207, 208, 230 and 231.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
214	Other Formation Work	Dollars

No other details are included in this 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 re-instatement 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
- 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 Standard

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 cross fall of adjacent sealed pavement is so irregular that the + 0, - 2% (absolute) standard cannot be achieved, the cross fall 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
215	Light Shoulder Grading	Shoulder km Side

Testing Requirements

Minimum test frequency	
Crossfall	1 per 500 m max. on straights Guide Post frequency max. 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).
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 kmph 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 tining of the existing shoulder (including the 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 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
- 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	<i>Selected Shoulder Gravel</i>

Restoration Standard

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 cross fall 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
- 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 Section

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,
- 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 +300mm/-100mm of the width nominated by the supervisor on the Works Order.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
216	Heavy Shoulder Grading	Shoulder km side Rural

Testing Requirements

Minimum test frequency	
Crossfall	1 per 50 m max. on straights Guide Post frequency max. 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.
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>

Reference	Title
SS	<i>Selected Shoulder Gravel</i>

Restoration Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
217	Light Shoulder Grading - Urban	m ²

Testing Requirements

Minimum test frequency	
Crossfall	1 per 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).
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions
 - 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
 - d. remove to site specified by your supervisor.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains
 - c. sweep sealed surface
 - 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 219) and water
4. compaction of the shoulder material
5. brooming of the sealed surface to remove any loose material.

Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
SS	<i>Selected Shoulder Gravel</i>

Restoration Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
218	Heavy Shoulder Grading - Urban	m ²

Testing Requirements

Crossfall 1 m per 50 m

WORK PREPARATION

Plant Requirements

Job truck

Grader

Truck and loader

Materials

Note: Selected shoulder Material to SS- supplied under Activity 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).
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions
 - 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
 - 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

- 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
 - c. constant width.
- 7. Check the work against the restoration standard.
- 8. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains
 - c. sweep sealed surface
 - 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, Heavy Shoulder Grading.

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
- 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>

Reference	Title
MRTS05	<i>Unbound Pavements</i>
SS	<i>Shoulder Gravel</i>

Restoration Standard

Nil (supply only).

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
219	Gravel Supply - Heavy Shoulder Grading	m ³ loose

Testing Requirements

Minimum test frequency	
Grading Q103A	1/250m ³
Linear Shrinkage Q106	1/250m ³
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.
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 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
- 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	<i>Selected Shoulder Gravel</i>

Restoration Standard

The finished surface of the gravel placed in the pothole shall be within ± 20 mm of the surrounding gravel.

The gravel patch shall be compacted to provide a sound, tight patch.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
220	Shoulder Pothole Patching	m ³ (loose)

Testing Requirements

The minimum testing requirements shall be as follows:

Minimum test frequency	
Grading Q103A	1/250m ³
Linear Shrinkage Q106	1/250m ³
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.
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 Works 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
- 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 Works 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 Standard

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 cross fall of adjacent sealed pavement is so irregular that the + 0, - 2% (absolute) standard cannot be achieved, the cross fall 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
221	Shoulder Resheeting	m ³ (loose)

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Scarify, shape and compact existing material	m ²
	Base, Unbound pavement Type (Subtype__)	m ³

Testing Requirements

Minimum test frequency	
Crossfall	1 per 50 m
Grading Q103A	1/250m ³
Linear Shrinkage Q106	1/250m ³
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.
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 Works 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 Works 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 Standard

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 cross fall of adjacent sealed pavement is so irregular that the + 0, - 2% (absolute) standard cannot be achieved, the cross fall 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
222	Remove Shoulder Material and Replace if Required	m ³ (loose)

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Scarify, shape and compact existing material	m ²
	Base, Unbound pavement Type (Subtype__)	m ³

Testing Requirements

Minimum test frequency	
Crossfall	1 per 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

Manpower Requirements

Leading hand	1
Operators	4
Truck drivers	
Traffic controllers	2

Average Daily Production

300 m³

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.
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions
 - 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
 - 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

- 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
 - c. constant width.
7. Check the work against the restoration standard.
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
 - 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 Activities numbered 215, 216, 217, 218, 219, 220, 221, 222, 230 and 231.

Activities Item and Unit of Measurement

Item	Description	Unit of Measurement
229	Other Unsealed Shoulder Work	Dollars

No other details are listed in this 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 Activities numbered 202, 203, 205, 216 and 221.

Activity Item and Unit of Measure

Item	Description	Unit of Measurement
230	Abnormal Water Cartage	Mega Litre Kms

No other details are listed in the 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 Activities numbered 221 and 205.

Activity Item and Unit of Measure

Item	Description	Unit of Measurement
231	Abnormal Gravel Cartage	Cubic Metres (Loose)-Kms

No other details are included in the 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	Linear metres per hour
> 20 – 25 tonne	50
> 16 – 20 tonne	30
> 2 – 4.5 tonne	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 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 Works Order

- 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 Standard

The drain shall be constructed to one of the typical types in Figures 6 and 7 of the 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 m 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
301	Install Earth Surface Drains	m

Testing Requirements

Minimum test frequency	
Drain Cross Section	1 per 50 m

Particular Planning Points to Consider

- What has caused the defect? Schedule another Activity to correct this, if needed.
- Make sure no other major maintenance or construction is scheduled for the area of the defect.
- Are there any related defects?
- Is an alternative remedy or major maintenance more appropriate?
- Specify or mark out the length of drain requiring excavation.
- Check for services, e.g. overhead wires and buried services. Mark these as appropriate.
- Specify the appropriate plant, materials and crew (including quantities of materials) and organise these.
- Arrange and specify a disposal area for excavated material.

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.

Activity Item and Unit of Measure

Item	Description	Unit of Measurement
301	Repair Earth Surface Drains	m

No other details are listed in the 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>

Restoration Standard

The drain cross section shall conform to the design requirements detailed on the Works 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
303	Install Concrete Surface Drains	m

Testing Requirements

Minimum test frequency	
Drain Cross Section	1 per 50 m

WORK PREPARATION

Plant Requirements

Job truck

Trucks

Excavator/bobcat/backhoe/gradall/grader

Loader

Rotary broom

Water tanker

Materials

Concrete as per MRTS03

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 Works Order.
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions
 - 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
 - c. truck surplus excavated material to site specified by your supervisor.
4. Cast concrete:
 - a. set formwork
 - b. check formwork
 - c. place concrete.
5. Check the work against the restoration standard:
 - a. make regular checks while you are doing the job
 - b. check to ensure even slope
 - c. check depth below shoulder.
6. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains
 - 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.

Activity Item and Unit of Measure

Item	Description	Unit of Measurement
304	Repair Concrete Surface Drains	m

No other details are listed in the 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, Heavy Formation Grading.

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	Linear metres per hour
> 20 – 25 tonne	50
> 16 – 20 tonne	30
> 2 – 4.5 tonne	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 (eg. 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 Works Order
- 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 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 m 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 Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
305	Clean Earth and Concrete Surface Drains	m

Testing Requirements

Minimum test frequency	
Drain Cross Section	1 per 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.
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, Retaining Structures and Protective Treatments</i>
MRTS70	<i>Concrete</i>

Restoration Standard

The concrete or paving blocks and dykes shall be repaired to the standards specified for new work in Specification MRTS03. All excess material shall be disposed of neatly outside the road reservation.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
306	Repair or Replace Concrete Slabs, Paving Blocks, Kerbs and Dykes	m ² / dollars

Testing Requirements

Minimum test frequency	
Concrete - Slump Q451A	< 4 m ³ No requirement
Compressive Strength Q455	> 4 m ³ as per MRS70
Geometrics	
Specified Tolerances	As per MRTS03
Maximum Lot Size	Works Order

WORK PREPARATION**Plant Requirements**

Job truck

Bobcat/backhoe/loader

Concrete saw/pavement breaker

Materials

Paving blocks as per MRTS03

Concrete as per MRTS03

Manpower Requirements

Leading hand	1
Labourers	2
Operators	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.
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
 - 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 works order.
4. Check the work against the restoration standard.
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
- 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>
	<i>Erosion and Sediment Control Manual Guidelines 2010 (CAC005M) – Transport and Main Roads</i>

Erosion and Sediment Control Measures are to be installed to comply with the requirements of the approved Environmental Management Plan (Maintenance).

Restoration Standard

Installation of and released from the Erosion and Sediment Control Measures shall conform to the requirement of the approved Environmental Management Plan (Maintenance).

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
310	Installation and Removal of Erosion and Sediment Control Measures	Dollars

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)
- Have the requirement of the EMP (Maintenance) been implemented?

No other details are listed in the Standard for the Activity.

311 Maintenance of Erosion and Sediment Control Measures

Description

The maintenance of erosion and sediment control devices installed under Activity 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
- 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>
	<i>Erosion and Sediment Control Manual Guidelines 2010 (CAC005M) – Transport and Main Roads</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 Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
311	Maintenance of Erosion and Sediment Control Measures	Dollars

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 requirement of the EMP (Maintenance) been implemented?
- Are other activities programmed for this area? If so, will new control measures need to be installed?

No other details are listed in the Standard for the Activity.

312 Service Sedimentation Ponds

Description

All works associated with the routine servicing of sedimentation ponds to ensure their planned operation in service is not compromised.

Activity Item and Unit of Measure

Item	Description	Unit of Measurement
312	Service Sedimentation Ponds	Dollars

No other details are listed in the Standard for this Activity.

313 Repair Sedimentation Ponds

Description

All works associated with the repair of sedimentation ponds to ensure their operation in service is effective.

Activity Item and Unit of Measure

Item	Description	Unit of Measurement
313	Repair Sedimentation Ponds	Dollars

No other details are listed in the Standard for this Activity.

319 Other Surface Drain Work

Description

Any work carried out to earth and concrete surface drains not covered by Activities numbered 301, 302, 303, 304, 305, 306, 310, 311, 312, 313 and 326.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
319	Other Surface Drain Work	Dollars

No other details are listed in this Standard for this Activity.

320 Replace Minor Culverts and Pipes

Description

All 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage Structures, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing (excluding emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavements</i>

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 ± 5 mm of the height of the surrounding road surface.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
320	Install Culverts and Pipes	m

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
912100	Provision for traffic	lump sum
942300	Culvert and/or end structure excavation	m ³
921100	Supply of concrete pipe culvert components	lump sum
921200	Supply of concrete box culvert components	lump sum
925100	Installation of concrete pipe components	m
925400	Installation of concrete box culvert components	m
927200	End structures to culverts, unreinforced concrete	m ³
	Plant mix stabilised pavement(incl. cement and curing)	m ²
955020	Tack Coat l/m ²	litre
955860	Dense Graded Asphalt pavement 14 mm mix	tonne
955870	Dense Graded Asphalt pavement 20 mm mix	tonne
955890	Dense Graded Asphalt pavement 40 mm mix	tonne

Testing Requirements

Minimum test frequency	
Materials	
Foundation Bedding/Haunch Zone, Overlay Zone and Side Zone	
Grading Q103A	1 per source/yr
Linear Shrinkage Q106	1 per source/yr
Compaction	
Base Visual	1 per line
Backfill Visual	2 per line
Asphalt Visual	1 per line
Geometrics Asphalt	
Specification Line and Level	1 per line
Materials/Mix Design	1 per source/yr
Maximum Density	1 per 80 t
Bitumen Content and Aggregate Grading, Asphalt Q308A or Q308C	1 per 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

Emulsion to MRTS21

Plant mix stabilised pavement Selected shoulder material as required to SS-

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.
9. Arrange and specify a disposal area for excavated material.

WORK PROCEDURES

Sequential Steps and Check Points

1. Establish traffic control – See:
 - a. vehicle warning lights
 - b. traffic control devices
 - c. safety clothing
 - 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
 - d. specified by your supervisor.
4. Install culvert:
 - a. set out invert level

- b. check safety of lifting equipment and Roadworks Signing Guide
 - c. methods.
5. Replace fill and pavement:
 - a. premix backfill material and water off site
 - b. bring material to right moisture content for
 - c. compaction
 - d. uniform 75 - 100 mm layers
 - e. check compaction.
 6. Apply seal or asphalt surfacing:
 - a. use Activity Number 128, steps 5 to 12, or
 - b. Activity Number 136, Steps 4 to 7.
 7. Check the work against the restoration standard.
 8. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 m² 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 Standard

The culverts, pipes and pits and their inlets and outlets shall be free from all material that could block the free flow of water.

Activity Item and Unit of Measurement

Item	Description	Unit 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.
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
 - 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
 - b. to site specified by your supervisor.

4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains.
6. Remove traffic control:
7. 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 m² waterway opening (equates to 600 mm diameter size 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 Works Order
- 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 Standard

- 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, then 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, then 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 Main Roads and Local Government Maintenance Responsibilities Guidelines”.
 - The site is to be left clean and tidy.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
322	Clean Culverts, Pipes and Pits - General	m ³ /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.
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 1.8m, and a total waterway area equal to or greater than 3.0 square metres.

Applicable Specification

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

Reference	Title
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>

Restoration Standard

The concrete culverts and/or pipes, pits repaired to the standards specified in the approved repair method.

Activity Item and Unit of Measurement

Item	Description	Unit 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

Concrete as per MRTS03

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.
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 vehicle warning lights:
 - a. traffic control devices
 - b. safety clothing
2. Roadworks Signing Guide
 - a. vehicle position.
3. Determine culverts, pipes or pits - from supervisor's instructions.
4. Repair culvert, pipe or pit:
 - a. in accordance with details in works order to be repaired and the relevant specification.
5. Check the work against the restoration standard.
6. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 equal to or greater than 3.0 square metres.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>

Restoration Standard

The steel structures repaired to the standards specified in the approved repair method.

Activity Item and Unit of Measurement

Item	Description	Unit 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

Concrete as per MRTS03

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
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
 - d. vehicle position.
2. Determine culverts, structure to be repaired from supervisor's instructions.
3. Repair structure:
 - a. in accordance with details in works order and the relevant specification.
4. Check the work against the restoration standard.

5. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>

Restoration Standard

The drainage inlet and or outlet repaired to the standard specified in the approved repair method.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
325	Repair Inlet and Outlet Scour	m ³

Testing Requirements

None listed

WORK PREPARATION

Plant Requirements

Job truck

Bobcat/backhoe/loader

Truck

Materials

Rock as per MRTS03

Concrete as per MRTS03

Geotextiles as per MRTS03

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
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
 - 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 works order and relevant specification.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>

Restoration Standard

As per specifications and details given in the Works Order.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
327	Replace or Install Cut Off Walls	m ³

WORK PREPARATION**Plant Requirements**

Job truck

Bobcat/backhoe/loader

Truck

Materials

Concrete as per MRTS03

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.
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
 - 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 works order.
5. Check the work against the restoration standard.
6. Leave work site safe and tidy:
 - a. remove all loose material
 - 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)
- 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, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing excluding Emulsions</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavement</i>
MRTS51	<i>Environmental Management</i>
	<i>Erosion and Sediment Control Manual Guidelines 2010 (CAC005M) – Transport and Main Roads</i>

Restoration Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
328	Minor Repairs to Erosion Sites	Dollars

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 requirement of the EMP (Maintenance) been implemented?
- Are other activities programmed for this area?

No other details are listed in the Standard for the Activity.

Plant-mix stabilised and dense graded asphalt pavement material may be placed by any equipment that does not cause the mix to segregate.

Restoration Standard

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 ± 5 mm when measured with a 1.2 m straightedge.

Supplementary Work Items and Unit of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Provision for traffic	lump sum
933300	Subsoil drains, Type C	m
933400	Subsoil drains, Type D	m
934600	Geotextiles under/within embankments	m ²
942100	Roadway excavation, all materials	m ³
943100	Roadway embankment	m ³
	Rockfill	m ³
	Plant mix stabilised pavement (incl. cement and curing)	m ³
956100	Prime (Grade, rate l/m ²)	litre
956200	Primerseal (Grade, rate l/m ²)	litre
956300	Seal (Grade, rate l/m ²)	litre
956600	Spreading prime cover aggregate (Size mm, rate 1m ³ /m ²)	m ³
956700	Spreading cover aggregate (Size mm, rate 1m ³ /m ²)	m ³
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m ³
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m ³
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170)	tonne
956910	Supply of material (Modified Bitumen Class 170 + % SBS Polymer)	tonne
956920	Supply of material (Bitumen Cutter)	tonne
956930	Supply of material (Adhesion Agent)	kg

Testing Requirements

Minimum test frequency	
Unbound Pavements and materials for stabilisation	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q217	1/source/year
Minimum test frequency	
Flakiness Index Q201B	1/source/year
CBR Q113A	1/source/year
Degradation Factor Q208B	1/source/year
Grading Q103A	1 per 100 m ³
Liquid Limit Q104A	1 per 100 m ³
Plastic Limit, PI Q105	1 per 100 m ³
Linear Shrinkage Q106	1 per 100 m ³
Stabilised Material	
Drying/Shrinkage Q128	1/source/year
Cement Content Q116B	1 per 100 m ³
Compaction-Earthworks, Unbound/Stabilised Pavement	
MDR Q110A	1 per 100 m ³
MDR(Cement Treated) Q110C	1 per 100 m ³
Density Q111A or Q112	1 per 100 m ³
Asphalt/Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	1 per 80 t
Bitumen Content and Aggregate Grading Q308A or Q308C	1 per 80 t
Asphalt	1 per 80 t
Compaction, Asphalt Q306A or Q314	1 per 40 t
Geometrics	
Horizontal Straightedge	1 per 10 m
Depth below Road Surface	1 per 10 m per layer
Cover Aggregate	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q21	1/source/year
Grading Q103D	1 per 400 t (2/lot min.)

Minimum test frequency	
Flakiness Index Q201B	1 per 400 t (2/lot min.)
Precoating Q216	1 per 400 t (2/lot min.)
Bitumen - sample	1 per tank
Application Rates - Spraying Records	
Max. lot size	1 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

Bitumen to MRTS17

Dense Graded & Open Graded Asphalt to MRTS30

Emulsion to MRTS21

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.
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
 - 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
 - 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
 - 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 standard.
8. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 numbered 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 1.8m, and a total waterway area equal to or greater than 3.0square metres.

Activity Item and Unit of Measurement

329 Other Minor Culvert, Pipe and Pit Work

No other details are listed in the 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 Activities Numbered 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
- the supply and installation of the subsoil drain in accordance with MRTS03 (including concrete outlets/surrounds, markers, etc.)
- all other work operations as detailed in the Applicable Specifications (i.e. MRTS03; MRTS04 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 l/m² 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 Works Order
- 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing excluding Emulsions</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavement</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 Standard

As per specifications except as provided hereunder:

- a) The standard of compaction shall be such that the final passes of the compaction equipment leave no impressions on the restored surface.
- b) The finished surface shall be within +5 mm of the height of the surrounding road surface.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
330	Install Subsoil Drain	m

Testing Requirements

Minimum test frequency	
Compaction Visual	4 per day
Straight Edge	1 per 20 m

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
933200	Subsoil drains, Type C	m
933400	Subsoil drains, Type D	m
	Plant mix stabilised pavement (incl. cement and curing)	m ³

Supplementary Work Item	Description	Unit of Measurement
	Base, Unbound Pavement, Type___(Subtype___)	m ³
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne

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.
9. Arrange and specify a disposal area for excavated material.

331 *Inspect and/or Cleanout Subsoil Drains*

Description

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

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>

Restoration Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
331	Inspect and/or Clean out Subsoil Drains	m

Testing Requirements

None listed.

WORK PREPARATION

Plant Requirements

Job truck

Truck

Bobcat/backhoe/loader

Materials

Marker Posts and Outlet Screens as per MRTS03

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.
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
 - d. vehicle position.
2. Determine subsoil drain to be cleaned:
 - a. from supervisor's instructions.
3. Flush out drain:
 - a. remove debris and silt
 - b. truck and additional material to site specified by your supervisor.
4. Check the work against the restoration standard.

5. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 Activities Numbered 140, 143 and 144.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing excluding Emulsions</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen Emulsion</i>
MRTS22	<i>Supply of Cover Aggregate</i>
MRTS30	<i>Asphalt Pavement</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 Standard

The repaired subsoil drains and restored pavement and shoulder shall conform to the specifications.

The finished surface shall be within ± 5 mm of the surrounding road surface.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
332	Repair Subsoil Drains	Dollars

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
912100	Provision for traffic	lump sum

Supplementary Work Item	Description	Unit of Measurement
	Repair subsoil drains	lump sum
	Plant mix stabilised pavement (incl. cement and curing)	m ³
	Unbound base Type (Subtype____)	m ³
955860	Dense Graded Asphalt pavement, 14 mm mix	tonne
955870	Dense Graded Asphalt pavement, 20 mm mix	tonne
955890	Dense Graded Asphalt pavement, 40 mm mix	tonne

Testing Requirements

Minimum test frequency	
Compaction Visual	4 per day
Straight Edge	1 per 20 m

WORK PREPARATION**Plant Requirements**

Job truck

Bobcat/backhoe/loader

Materials

Culvert components as per MRTS03

Concrete as per MRTS03

Dense Graded Asphalt to MRT30

Emulsion to MRTS21

Bitumen to MRTS17

Cover Aggregate to MRTS22

Plant mix stabilised pavement

Selected shoulder material as required to SS-

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

333 Repair Subsoil Drains (RAMC)

Details to be advised.

334 Clean Culverts, Pipes & Pits-Minor (RAMC)

Details to be advised.

339 Other Subsoil Drain Work

Description

Includes work carried out on subsoil drain systems not included under Activities numbered 330, 331 and 332.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
339	Other Subsoil Drain Work	Dollars

No other details are listed in the 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 Standard

The floodway surface and associated batters and aprons shall be free from debris, silt and regrowth of vegetation.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
340	Clean Floodways	m ²

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.
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
 - d. vehicle position.
2. Determine floodway to be cleaned:
 - a. from supervisor's instructions.
3. Clean floodway and aprons:
 - a. remove debris and silt
 - b. truck surplus material to site specified by your supervisor.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>

Restoration Standard

The floodways shall be repaired to the standards specified in the approved repair method.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
341	Repair Floodways	Dollars

Testing Requirements

None listed.

WORK PREPARATION

Plant Requirements

Job truck

Bobcat/backhoe/loader

Materials

Rock as per MRTS03

Concrete as per MRTS03

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.
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
 - d. vehicle position.
2. Determine floodway to be repaired:
 - a. from supervisor's instructions.

3. Repair floodway:
 - a. in accordance with details in works order.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains.
6. Remove traffic control:
 - a. clean/repair as necessary
 - b. 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>

Restoration Standard

The floodway slopes and margins shall be repaired to the standards specified in the approved repair method.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
342	Repair Floodway Slopes and Margins	m ³

Testing Requirements

None listed

WORK PREPARATION

Plant Requirements

Job truck

Bobcat/backhoe/loader

Materials

Rock as per MRTS03

Concrete as per MRTS03

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.
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
 - 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 works order.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 Activities numbered 340, 341 and 342.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
349	Other Floodway Work	Dollars

No other details are listed in the Standard for the 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 Works 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.

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 Specification

Grass and other vegetation shall be mowed and programmed with Activity 407 where necessary so as to, at all times, provide motorists with a clear view of all signs, guide markers and guardrails and to provide Entering Sight Distance as per the *Austrroads 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.

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

Restoration Standard

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 (kmph)	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 is necessary for visibility to approaching traffic.
- 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 kmph 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
401	Tractor Slashing, Rural	Hectare

Testing Requirements

Minimum test frequency	
Cut height	1 per 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.
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 metres 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 No. 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 Works 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.

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 Specification

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 guardrails 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.

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

Restoration Standard

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 No. 401.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
402	Tractor Slashing, Urban	Hectare

Testing Requirements

Minimum test frequency	
Cut height	1 per 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.
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 No. 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
403	Tractor Slashing -Boom Mower	Square Metres

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 401 – Tractor Slashing – Rural and Activity 402 Tractor Slashing – Urban 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 handmowing 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 Works 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.

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 Specification

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 guardrails and to provide Entering Sight Distance as per the *Austrroads Guide to Traffic Engineering Practice Part 5 -Intersections at Grade (Section 5.2.3)*.

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

Restoration Standard

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 No. 401.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
404	Hand Mowing	m ²

Testing Requirements

Minimum test frequency	
Cut height	1 per 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.
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 Works 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.

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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>

The extent of visibility clearing shall be:

- The restoration standard required at these locations will be to remove trees and shrubs from the shoulder of the road to a line 2.0 m past the bottom of the table drain, or to 6.0 m from the edge of the through lane, whichever is the lesser.
- Visibility triangles at intersections to establish, where possible, entering sight distance as per *Austrroads 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 9.0 m, or on tight curves in higher speed environments, 14.0 m.

The following gives greater detail.

- 120 m in front of official signs as necessary for visibility to approaching traffic.
- Trees and shrubs shall be cut near ground level and the debris removed to a recognised dumping site. Cut stumps and/or regrowth be herbicide treated. Wherever possible the cleared areas are then to be maintained using a slasher as required.

Restoration Standard

All specified branches/trees removed/trimmed.

No regrowth. No debris left on the sealed carriageway.

Activity Item and Unit of Measurement

Item	Description	Unit 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.
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 MR). This includes either the sprayed or manual application of chemical herbicide. Excludes the spraying of other plants which is undertaken as Activity 407 – Herbicide Spraying.

Other vegetation can be treated subject to the approval of the Principal under Activity No. 407 Herbicide Spraying.

Work Operations

The following operations shall be included as part of the above Activity:

Speed Environment (kmph)	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.
- 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. Commercial Operator's Manual*.
- 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 the DPI

- Herbicide to be used in accordance with the manufacturers recommendations.

Restoration Standard

All targeted vegetation as per the approved procedures killed.

No other vegetation sprayed or killed.

Activity Item and Unit of Measurement

Item	Description	Unit 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.
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 No. 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 Works 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

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

The following provisions shall apply to the spraying of herbicides:

1. All vegetation within 1 metre of all signs, guide markers and guardrails 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 1983, Commercial Operator's Manual.
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.
7. Herbicides are to be used in accordance with the manufacturer's recommendations.

Restoration Standard

All targeted vegetation killed.

No other vegetation sprayed.

Activity Item and Unit of Measurement

Item	Description	Unit 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.
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 Specification

Vegetation shall be mowed so as to, at all times, provide motorists with a clear view of all signs, guide markers and guardrails and to provide Entering Sight Distance as per the *Austrroads 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.

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

Restoration Standard

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 (kmph)	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 kmph 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 m high for the areas stated above.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
408	Tractor Treatment, Chemical	Hectare

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.
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:
 - a. see Roadworks Sign Signing Guide
 - b. vehicle warning lights
 - c. traffic control devices
 - d. safety clothing
 - e. vehicle position
 - f. 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. 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
 - b. too high is inefficient.

5. Mow the specified area:
 - a. mow in the direction of traffic
 - b. travel at about 6 km/hour
 - c. use knapsack spray around roadside furniture, trees etc., if required.
6. Check the work against the restoration standard.
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 fertilizing, watering, mulching and weeding.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS16	<i>Landscape and Revegetation Works</i>

Restoration Standard

As per MRS16 and details in Works Order.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
409	Seeding or Planting	m ²

Testing Requirements

Minimum test frequency	
Hole Size	1 per 10 holes
Watering	Each lot

WORK PREPARATION

Plant Requirements

Job truck

Bobcat/backhoe/grader/loader

Trucks

Water tanker

Materials

Seeds

Turf

Trees

Shrubs

Fertilizer

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 fertilizing of seeded or planted areas.
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions.
3. Spread top soil as required.
4. Seed the specified area:
 - a. apply mulch and seed
 - b. check application rates

- c. water as specified.
- 5. Plant the specified area:
 - a. check the spacing of planting
 - b. water as specified
 - c. apply mulch if required.
- 6. Check the work against the restoration standard.
- 7. Leave work site safe and tidy:
 - a. ensure top soil 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS16	<i>Landscape and Revegetation Works</i>

Restoration Standard

As per MRTS16 (series) and details in Works Order.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
410	Landscape Planting	each (plant)

Testing Requirements

Minimum test frequency	
Hole Size	1 per 10 holes
Watering	Each lot

WORK PREPARATION

Plant Requirements

Job truck

Bobcat/backhoe/loader

Trucks

Water tanker

Materials

Trees

Shrubs

Fertilizer

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 fertilizing of planted areas.
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
 - 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
 - b. apply mulch if required.
5. Check the work against the restoration standard.
6. Leave work site safe and tidy:
 - a. ensure top soil 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 No. 410. Includes fertilising, and weeding of facility.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
411	Maintain Landscaped Shrubs	Dollars

No other details are listed in the 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS16	<i>Landscape and Revegetation Works</i>

Restoration Standard

As per MRTS16 (series above) and details in works order.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
412	Mulching	m ²

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.
"Residual" herbicides are not permitted for use.
7. Ensure the spray operator has an appropriate licence in accordance with the *Agricultural Chemicals Distribution Control Act 1966 - 1978 and 1983, Commercial Operator's Manual*.

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.
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
 - b. supervisor may have specified these in your instructions.
4. Check weather and wind:
 - a. do not spray if rain likely
 - 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
 - b. take care to spray only the specified vegetation.
6. Record the area sprayed:
 - a. notify your supervisor if you spray other vegetation
 - 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 standard.
10. Leave work site safe and tidy:
 - a. remove any spilt or excess material.
11. Remove traffic control:
 - a. clean/repair as necessary.

415 Roadside Burning Off

The Treatment

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
415	Roadside Burning Off	Hectares / Dollars

No other details are listed in the Standard for this Activity.

418 Clearing of Roadside Hazards**The Treatment**

All works associated with the clearing of roadside hazards including disposal.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
418	Clearing of Roadside Hazards	Dollars

No other details are listed in the Standard for this Activity.

419 Other Vegetation Control Works**Description**

Any work carried out to control vegetation on the road reservation not covered by Activities numbered 401, 402, 403, 404, 405, 406, 408, 409, 410, 411, 412 and 415.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
419	Other Vegetation Control Works	Dollars

No other details are listed in the 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 cm² 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 Works 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.

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 cm² 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 if 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 cm² potentially hazardous to traffic (as nominated above) remaining on the sealed roadway.
- No litter shall remain in the vicinity of environmentally sensitive areas.
- The site shall be left clean and tidy.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
420	Roadside Litter Collection	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.
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 cm² 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 Works 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.

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 cm² 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 if 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 cm² potentially hazardous to traffic (as nominated above) remaining on the sealed roadway
- No litter shall remain in the vicinity of environmentally sensitive areas.
- The site shall be left clean and tidy.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
421	Roadside Litter Collection - Urban	m ³

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.
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 Specification

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

Restoration Standard

All graffiti is removed.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
422	Graffiti Removal	m ² / Dollars

Testing Requirements

Minimum test frequency	
Graffiti removed Visual	1 per 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?
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
 - 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
 - c. rinse with clean water.
4. Check for damage to coating:
 - a. if damage, advise supervisor.
5. Check the work against the restoration standard.
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, refer Activity Number 130.

Applicable Specification

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.

Activity Item and Unit of Measurement

423 Roadside Sweeping m

Testing Requirements

Minimum test frequency	
Tight surface	1 per 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.

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
 - 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
 - c. use two-way radio for communication.
5. Check the work against the restoration standard.
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 Works 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.

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 Specification

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 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
- 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 Clauses 3.1 and 3.2 should be referred to the Principal's Delegate. The Principal's Delegate or representative shall then instruct the Contractor on whether or not to remove the sign.

Restoration Standard

No unauthorised signs on the road reserve except those which have been reported to the police or to the Principal's Delegate.

Activity Item and Unit of Measurement

Item	Description	Unit 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.
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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>

Restoration Standard

The earthworks shall conform to specification MRTS04 and the directions on the Works Order.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
425	Earthworks, Visibility Clearing	m ³

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
912100	Provision for traffic	lump sum
942100	Roadway excavation, all materials	m ³

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
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 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.
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions
 - 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
 - c. truck surplus excavated material to site specified by your supervisor.
4. Check the work against the restoration standard:
 - a. make regular checks while you are doing the job
 - b. check depth of excavation
 - 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
 - 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS08	<i>Plant-mixed Stabilised Pavements Using Cement or Cementitious Blends</i>
MRTS11	<i>Sprayed Bituminous Surfacing (excl. Emulsions)</i>
MRTS12	<i>Sprayed Bitumen Emulsion Surfacing</i>
MRTS17	<i>Bitumen</i>
MRTS19	<i>Clutter and Flux Oils</i>
MRTS21	<i>Bitumen 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 Standard

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 ± 5 mm when measured with a 1.2 m straightedge.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
426	Repair Minor Stability Problems	m ³

Supplementary Work Items and Unit of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Provision for traffic	lump sum
933300	Subsoil drains, Type C	m
933400	Subsoil drains, Type D	m
934600	Geotextiles under/within embankments	m ²
942100	Roadway excavation, all materials	m ³
943100	Roadway embankment	m ³
	Rockfill	m ³
	Plant-mix stabilised pavement (incl. cement and curing)	m ³
956100	Prime (Grade, rate l/m ²)	litre
956200	Primerseal (Grade, rate l/m ²)	litre
956300	Seal (Class, rate l/m ²)	litre
956600	Spreading prime cover aggregate (Size mm, rate 1m ³ /m ²)	m ³
956700	Spreading cover aggregate (Size mm, rate 1m ³ /m ²)	m ³
958100	Supply of cover aggregate (precoated) (10 mm nominal size)	m ³
958110	Supply of cover aggregate (precoated) (14 mm nominal size)	m ³
958120	Supply of cover aggregate (precoated) (16 mm nominal size)	m ³
956900	Supply of material (Bitumen Class 170)	tonne
956910	Supply of material (Modified Bitumen Class 170+ % SBS Polymer)	tonne
956920	Supply of material (Bitumen Cutter)	tonne
956930	Supply of material (Adhesion Agent)	kg

Testing Requirements

Minimum test frequency	
Unbound Pavements and materials for stabilisation	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Minimum test frequency	
Weak Faces Q217	1/source/year
Flakiness Index Q201B	1/source/year
CBR Q113A	1/source/year
Degradation Factor Q208B	1/source/year
Grading Q103A	1 per 100 m ³
Liquid Limit Q104A	1 per 100 m ³
Plastic Limit, PI Q105	1 per 100 m ³
Linear Shrinkage Q106	1 per 100 m ³
Stabilised Material	
Drying/Shrinkage Q128	1/source/year
Cement Content Q116B	1 per 100 m ³
Compaction -Earthworks, Unbound/Stabilised Pavement	
MDR Q110A	1 per 100 m ³
MDR(Cement Treated) Q110C	1 per 100 m ³
Density Q111A or Q112	1 per 100 m ³
Asphalt Premix	
Materials/Mix Design	1/source/year
Maximum Density of Asphalt Q307	1 per 80 t
Bitumen Content and Aggregate Grading Q308A or Q308C	1 per 80 t
Asphalt	1 per 80 t
Compaction, Asphalt Q306A or Q314	1 per 40 t
Geometrics	
Horizontal Straightedge	1 per 10 m
Depth below Road Surface	1 per 10 m per layer
Cover Aggregate	
10% Fines Q205B	1/source/year
Wet/Dry Strength Q205C	1/source/year
Crushed Particles Q215	1/source/year
Weak Faces Q21	1/source/year
Grading Q103D	1 per 400 t (2/lot min.)

Minimum test frequency	
Flakiness Index Q201B	1 per 400 t (2/lot min.)
Precoating Q216	1 per 400 t (2/lot min.)
Bitumen - sample	1 per tank
Application Rates - Spraying Records	
Max. lot size:	1 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

Bitumen to MRTS17

Dense Graded & Open Graded

Asphalt Pavements to MRTS30

Emulsion to MRTS21

Plant mix stabilised pavement

Selected shoulder material as required

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 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.
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
 - 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
 - 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
 - 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 standard.

8. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
427	Maintenance of Cultural Heritage Site	m

No other details are listed in the Standard for this Activity.

429 Other Roadside Work

Description

Any work carried out on the roadside not covered by Activities Numbered 328, 420, 421, 422, 423, 424, 425 and 426.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
429	Other Roadside Work	Dollars

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
430	Service Restoration	Dollars

No other details are listed in the Standard for this Activity.

439 Other Restoration Work

Description

Any other restoration work done not covered by Activities numbered 430 and 452.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
439	Other Restoration Work	Dollars

No other details are listed in the 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 of Main Roads, 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 Works 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
- prompt notification to the Principal of illegally camped persons
- rest area shall be regularly inspected and serviced to ensure that the Restoration Standards are met at all times.

Applicable Specification

Rest area shall be regularly inspected and serviced to ensure that the restoration standards set out below are met at all times.

Restoration Standard

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
 - 407 Herbicide Spraying
- Signing defects - repaired as per:
 - 424 Remove Unauthorised Signs
 - 501 Install New and/or Relocate Old Signs
 - 502 Repair and Replace Signs (excl. Guide Signs)
 - 504 Cleaning Signs
 - 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 Item and Unit of Measurement

Item	Description	Unit 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
 - 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 of Transport & Main Roads, 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 Specification

Driver reviver sites shall be regularly inspected and serviced to ensure that the restoration standards set out below are met at all times.

Restoration Standard

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
 - 407 Herbicide Spraying
- Signing defects – repaired as per:
 - 424 Remove Unauthorised Signs
 - 501 Install New and/or Relocate Old Signs
 - 502 Repair and Replace Signs (excl. Guide Signs)
 - 504 Cleaning Signs
 - 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
441	Driver Reviver Site Servicing	Dollars

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
 - g. litter.
3. Specify and organise the appropriate plant, materials and crew (including quantities of materials).

No other details are listed in the Standard for this activity.

449 Other Services Work**Description**

Work involved with any other roadside service type Activity undertaken in addition to that associated with Activity Nos. 440 and 441.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
449	Other Services Work	Dollars

No other details are listed in the Standard for this Activity.

450 Call Out**Description**

All activities undertaken following a call out, by the Police or other recognised authority, to an emergency situation on the road network.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
450	After Hours Call Out Service	Dollars

No other details are listed in the Standard for this Activity.

452 Emergency Call Out Activities**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 undertake 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 cm² 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 Works 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
- 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>Manual of Uniform Traffic Control Devices (Queensland)</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 Standard

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
452	Emergency Call Out Activities	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.
2. Consider if a scheduled Activity is required.

453 *Incident Response (RAMC)*

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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
460	Management of Declared Plants	Dollars

No other details are listed in the Standard for this Activity.

500 ROAD FURNITURE**501 Install New and/or Relocate Existing Signs****Description**

The installation of new 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 one (1) square metre supported on one post support. It does not include work carried out to guide signs; signs greater than one (1) square metre or signs requiring more than one post. Activity Nos.502 or 506 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).

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 Works 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.

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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS70	<i>Concrete</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</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 Standard

The sign and its support structure shall be erected to the requirements of Specification MRTS14 and the Provision for Traffic.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
501	Install New Signs (excluding Guide Signs)	Each (Sign)

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Supply of road signs	m ² *
	Installation of road signs * m ² of sign face	m ² *

Testing Requirements

Minimum test frequency	
<ul style="list-style-type: none"> • Geometrics • Footings • diameter, depth, transverse location 	1 per footing
Posts – location	1 per post
Sign placement	
longitudinal placement	1 per sign
transverse location	1 per sign
height	1 per sign
orientation	1 per sign
Maximum Lot Size	A Works 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.
5. Make sure that the new sign location will not obscure vision.

502 Repair Signs (excluding Guide Signs)**Description**

The repair of damaged 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 greater than one square metre or signs requiring more than one post.

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 Works 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.

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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</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 Standard

The sign and/or its support structure shall be repaired or replaced to the standards specified in Specification MRTS14 and the *Manual of Uniform Traffic Control Devices* and the Supplementary Specification.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
502	Repair Signs (excluding Guide Signs)	Each (Sign)/Dollars

Testing Requirements

As per Activity No. 501 where applicable.

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Repair of Signs	Each (Sign)
	Replacements of signs * m ² of sign face	m ^{2*}

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).
4. Can some of the stored, recovered Principal's materials be reused?
5. Check that the sign is in stock. If not, order one and allow for the delay in supply.
6. If the existing sign is a regulatory sign, the sign must be replaced immediately the damaged sign is removed.

503 Relocate Existing Signs (excluding Guide Signs)**Description**

All work associated with the relocation of existing signs excluding guide signs as authorised by the Principal. Work under this Activity applies to signs with a face area of less than or equal to one square metre supported on one post support. It does not include work carried out to guide signs; signs greater than one square metre or signs requiring more than one post, Activity 502 is 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, 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 (includes 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 Works 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.

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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS70	<i>Concrete</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</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 Standard

The sign and its support structure shall be erected to the requirements of Specification MRTS14 and the *Manual of Uniform Traffic Control Devices*.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
503	Relocate Existing Signs (excluding guide signs)	Each (Sign)

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Removal and re-erection of signs* m ² of sign face	m ²

Testing Requirements

Minimum test frequency	
Geometrics	
Footings – diameter, depth, transverse, location	1 per footing
Posts – location	1 per post
Sign placement	
longitudinal placement	1 per sign
transverse location	1 per sign
height	1 per sign
orientation	1 per sign
Maximum Lot Size	A Works 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 502 and order another sign.
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 Works 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.

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 Specification

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 Standard

The sign face shall be cleaned in such a way that all dirt and contaminants are removed.

Activity Item and Unit of Measurement

Item	Description	Unit 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 (sign too close to unsealed shoulder, etc.).
3. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

505 Install New 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS70	<i>Concrete</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</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 Standard

The sign and its support structure shall be erected to the requirements of Specification MRTS14 and the *Manual of Uniform Traffic Control Devices*.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
505	Install New Guide Signs	Dollars

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Supply of road signs	m ² *
	Installation of road signs * m ² of sign face	m ² *

Testing Requirements

Minimum test frequency	
Geometrics	
Footings – diameter, depth, transverse, location	1 per footing
Posts – location	1 per post
Sign placement	
longitudinal placement	1 per sign
transverse location	1 per sign
height	1 per sign
orientation	1 per sign
Maximum Lot Size	A Works 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.
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
 - 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 standard.
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 No. 502)

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 Works 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.

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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</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 Contractors depot during the approval process.

Restoration Standard

The sign and/or its support structure shall be repaired or replaced to the standards specified in Specification MRTS 14 and the *Manual of Uniform Traffic Control Devices* and the Supplementary Specification.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
506	Repair Guide Signs	Dollars

Testing Requirements

As per Activity No. 501 where applicable.

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Repair of Signs	each
	Replacement of Signs * m ² of sign face	m ² *

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 re-located?
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).

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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS70	<i>Concrete</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</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 Standard

The sign and its support structure shall be erected to the requirements of Specification MRTS14 and the *Manual of Uniform Traffic Control Devices*.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
507	Relocate Guide Signs	Dollars

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Removal and re-erection of sign* m ² of sign face	m ² *

Testing Requirements

Minimum test frequency	
Geometrics	
Footings – diameter, depth, transverse, location	1 per footing
Posts – location	1 per post
Sign placement	
longitudinal placement	1 per sign
transverse location	1 per sign
height	1 per sign
orientation	1 per sign
Maximum Lot Size	Works 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.
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
 - 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 standard.
7. Leave work site safe and tidy:
 - a. remove all loose material.
8. Remove traffic control:
 - a. clean/repair as necessary.

509 Other Sign Work

Description

All other signwork not covered by Activities numbered 501, 502, 503, 504, 505, 506 and 507.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
507	Relocate Guide Signs	Dollars

No other details are listed in the Standard for this Activity

510 Install New Guide Markers

Description

The supply and installation of guide markers to delineate the road alignment.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>

Delineators shall conform to the requirements of AS 1906 - Part 2 - 1981 "Retro reflective Devices (non-pavement applications)" and shall be a type approved by the Principal's Delegate.

Restoration Standard

As per the specifications.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
510	Install New Guide Markers	Each (Marker)

WORK PREPARATION

Plant Requirements

Job truck

Excavating tools

Materials

Guide markers as per MRTS14

Delineators (if applicable) as per MRTS14

Road-marking paint as per MRTS14

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 guide markers
2. Check if other maintenance or construction is scheduled for the area of the defect
3. 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
 - 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
 - b. ensure spacing is reduced sufficiently such that the next marker can be seen along winding roads.
4. Excavate for marker.
5. Install markers:
 - a. ensure marker is 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
 - 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 standard.
 8. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>

Restoration Standard

The guide marker shall be cleaned such that all dirt and contaminants are removed and/or the marker repainted as specified in MRS 11.14.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
511	Cleaning and/or Painting Guide Markers	Each (Marker)

WORK PREPARATION

Plant Requirements

Job truck

Cleaning tools

Materials

Paint as per MRTS14

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.
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
 - 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
 - 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 standard.
7. Leave work site safe and tidy:
 - a. remove all loose material
 - 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 No. 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 Works 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.

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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>

The repair of guide markers shall consist of restoring the posts to the vertical and replacing delineators, if applicable.

Delineators shall conform to the requirements of *AS 1906 - Part 2 - 1981 "Retro reflective Devices (non-pavement applications)"* and shall be a type approved by the Principal's Delegate.

Restoration Standard

The guide marker shall be repaired or replaced to the requirements specified for road edge guide posts in *MRTS14 Road Furniture*.

The *Manual of Uniform Traffic Control Devices (Queensland)*, the Supplementary Specification and as specified above.

Activity Item and Unit of Measurement

Item	Description	Unit 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

Supplementary Work Item	Description	Unit 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.
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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>

Delineators shall conform to the requirements of AS 1906 - Part 2 - 1981 "*Retro reflective Devices (non-pavement applications)*" and shall be a type approved by the Principal's Delegate.

Restoration Standard

The delineators shall be repaired or replaced to the requirements specified in MRTS14 *Road Furniture*, the *Manual of Uniform Traffic Control Devices (Queensland)*, and as specified above.

Activity Item and Unit of Measurement

Item	Description	Unit 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.
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
 - 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
 - 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 ensure painted location mark exists on adjacent pavement.
5. Check the work against the restoration standard.
6. Leave work site safe and tidy:
 - a. remove all loose material
 - 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.

Applicable specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
-	<i>Standard Drawings Numbers 1356 and 1357</i>

Restoration Standard

The guide marker shall be repaired to the requirements specified for road edge guide posts in MRTS14 *Road Furniture* and Standard Drawings No's 1356 and 1357.

The *Manual of Uniform Traffic Control Devices (Queensland)*.

Activity Item and Unit of Measurement

Item	Description	Unit 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.
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 specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
-	<i>Standard Drawings Numbers 1356 and 1357</i>

Delineators shall conform to the requirements of *AS 1906 - Part 2 - "Retro-reflective devices (non-pavement applications)"* and shall be a type approved by the Principal's Delegate.

Restoration Standard

The guide marker shall be replaced in accordance with the requirements specified for road edge guideposts in MRTS14 *Road Furniture* and Standard Drawings No's 1356 and 1357.

The *Manual of Uniform Traffic Control Devices (Queensland)*.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
515	Replace Guide Markers	Each (Marker)

Testing Requirements

Minimum test frequency	
Geometrics	
Height	each post
Vertical	each post
Horizontal	each post

WORK PREPARATION**Materials**

Guide markers as per MRTS14.

Delineators (if applicable) as per MRTS14.

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.
4. Specify and organise the appropriate plant, material and crew (including quantities of materials).

No other details are listed in the Standard for this Activity.

519 Other Guide Post and Marker Work**Description**

Any other work carried out to guide posts and markers not covered by Activities numbered 510, 511, 512, 513, 514 and 515.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
519	Other Guide Post and Marker Work	Dollars

No other details are listed in the 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>

Restoration Standard

The guardrail shall be erected to the requirements of Specification MRTS14 and the Manual of Uniform Traffic Control Devices.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
520	Install New Guard Rail, Barrier Furniture	m

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
96340	Steel beam guardrail	m

Testing Requirements

Minimum test frequency	
Geometrics: • Footings • diameter, depth, transverse location	1 per footing
Placement	1 per section
longitudinal placement	1 per section
transverse location	1 per post
height	1 per 10 m

Minimum test frequency	
Maximum Lot Size:	A Works Order

WORK PREPARATION**Plant Requirements**

Job truck

Post driving equipment

Excavating equipment

Materials

Concrete (premix or materials)

Guardrail panels and posts as per MRTS14

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 guardrail.
2. Check that no work is planned in the immediate future that would make the guardrail 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).
5. Check that the guardrail 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
 - 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
 - d. ensure post is firmly embedded.
4. Attach guardrail panels.
5. Check the work against the restoration standard.
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 Guardrail, Barrier Furniture

Description

The cleaning of guardrail and barrier furniture to remove dirt and other contaminants and/or its painting.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>

Restoration Standard

All dirt and contaminants are removed. The painting shall conform to the requirement of MRTS14.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
521	Clean and/or Paint Guardrail, Barrier Furniture	m

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

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 guardrail/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 guardrail?
5. Is an alternative remedy or major maintenance more appropriate?
6. Specify or mark out the length of guardrail/barrier requiring cleaning.
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions.
3. Clean guardrail/barrier:
 - a. mild detergent solution
 - b. remove residual detergent with clean water
 - c. remove peeling paint to sound base.

4. Check for defects in guardrail/barrier:
 - a. if guardrail/barrier is defective or below standard advise supervisor.
5. Check the work against the restoration standard.
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 Guardrail, Barrier Furniture

Description

The repair or replacement of damaged guardrails/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 Works 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.

Where the terminal end of the guardrail is significantly damaged and requires replacing, a 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
	<i>Relevant Standard Drawings</i>

The work shall include:

- a) Removal of damaged guardrail components
- b) Supply of new guardrail components

- c) Straightening of existing posts
- d) Installation of new posts
- e) Erection of new guardrail
- f) Transport of old components to the nearest maintenance depot.

Restoration Standard

The guardrail and its support structure shall be replaced to the requirements of Specification MRTS14 and the *Manual of Uniform Traffic Control Devices*.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
522	Repair or Replace of Guardrail, Barrier Furniture	Dollars

Testing Requirements

The minimum test frequency shall be as per Activity No. 520, where applicable.

Particular Planning Points to Consider

1. Define the guardrail/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 guardrail/barrier requiring repair/replacement.
7. Specify and organise the appropriate plant, materials and crew (including the quantities of materials).

523 *Repair Guardrail, Barrier Furniture*

Description

All works associated with the repair of damaged roadside guardrail or other barrier furniture.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
	<i>Relevant Standard Drawings</i>

The work shall include:

- a) Removal of damaged guardrail components
- b) Repair of guardrail components
- c) Straightening of existing posts
- d) Erection of guardrail

- e) Transport of any old components to the nearest maintenance depot.

Restoration Standard

The guardrail and its support structure shall be repaired to the requirements of Specification MRTS14 and the *Manual of Uniform Traffic Control Devices*.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
523	Repair Guardrail, Barrier Furniture	m

Testing Requirements

Minimum test frequency	
Geometrics: • Footings • diameter, depth, transverse location	1 per footing
Placement	1 per section
longitudinal placement	1 per section
transverse location	1 per post
height	1 per 10 m

WORK PREPARATION

Plant Requirements

Job truck

Excavating/post driving equipment

Materials

Guardrail panels and posts as per MRS14

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 guardrail/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 guardrail/barrier requiring repair/replacement.
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions.
3. Repair guardrail/barrier:
 - a. straighten posts
 - b. replace damaged components.
4. Check if cleaning or painting is required:
 - a. if required advise supervisor.
5. Check the work against the restoration standard.
6. Leave work site safe and tidy:
 - a. remove all loose material.
7. Remove traffic control:
 - a. clean/repair as necessary.

524 **Replace Guardrail, Barrier Furniture**

Description

All works associated with the replacement of damaged roadside guardrail or other barrier furniture with new barrier materials.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
	<i>Relevant Standard Drawings</i>

The work shall include:

- a) Removal of damaged guardrail components

- b) Supply of new guardrail components
- c) Straightening of existing posts
- d) Installation of new posts
- e) Erection of new guardrail
- f) Transport of old components to the nearest maintenance depot

Restoration Standard

The guardrail and its support structure shall be replaced to the requirements of Specification MRTS14 and the Manual of Uniform Traffic Control Devices.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
524	Replace Guardrail, Barrier Furniture	m

Testing Requirements

The minimum test frequency shall be as per Activity No. 520, where applicable.

WORK PREPARATION

Plant Requirements

Job truck

Excavating/post driving equipment

Materials

Guardrail panels and posts as per MRTS14

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 guardrail/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 guardrail/barrier requiring replacement.

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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions.
3. Repair guardrail/barrier:
 - a. straighten posts
 - b. replace damaged components.
4. Check if cleaning or painting is required:
 - a. if required advise supervisor.
5. Check the work against the restoration standard.
6. Leave work site safe and tidy:
 - a. remove all loose material.
7. Remove traffic control:
 - a. clean/repair as necessary.

525 *Replace Guardrail Delineators*

Description

All works associated with the replacement of defective delineators on roadside guardrail furniture.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
	<i>Relevant Standard Drawings</i>

The work shall include:

- a) Removal of damaged guardrail components, delineators
- b) Supply of new guardrail components
- c) Straightening of existing posts
- d) Installation of new components

- e) Transport of old components to the nearest maintenance depot.

Restoration Standard

The guardrail component and its support structure shall be restored to the requirements of Specification MRTS14 and the *Manual of Uniform Traffic Control Devices*.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
524	Replace Guardrail, Delineators	Each (Delineator)

Testing Requirements

Not listed.

WORK PREPARATION

Plant Requirements

Job truck

Materials

Delineators as per MRTS14

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.
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
 - 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 standard.
 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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
	<i>Relevant Standard Drawings</i>

The work shall include:

- a) Removal of damaged barrier components
- b) Repair of barrier components
- c) Straightening of existing posts
- d) Erection of barrier
- e) Transport of any old components to the nearest maintenance depot.

Restoration Standard

The wire rope barrier shall be reinstated to the manufacturer's specifications.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
530	Repair Wire Rope Barrier	m / Dollars

Testing Requirements

As per manufacturer's specifications and the minimum test frequency for Activity No. 520, where applicable.

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

531 Upgrade Existing Barrier End**Description**

All works associated with the upgrading of barrier ends to current standards.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
	Relevant <i>Standard Drawings</i>

The work shall include:

- a) Removal of non-standard barrier end.
- b) Replacement of barrier end with new to current standard.
- c) Transport of any old components to the nearest maintenance depot.

Restoration Standard

The barrier end shall be installed to the manufacturer's specifications.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
531	Upgrade Existing Barrier End	Each

Testing Requirements

As per manufacturer's specifications and the minimum test frequency for Activity No. 520, where applicable.

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

532 Repair Ingal Barrier**Description**

All works associated with the repair of damaged roadside Ingal barrier furniture.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
	Relevant <i>Standard Drawings</i>

The work shall include:

- a) Removal of damaged barrier components
- b) Repair of barrier components
- c) Straightening of existing posts
- d) Erection of barrier
- e) Transport of any old components to the nearest maintenance depot.

Restoration Standard

The Ingal barrier shall be reinstated to the manufacturer's specifications.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
532	Repair Ingal Barrier	m / Dollars

Testing Requirements

As per manufacturer's specifications and the minimum test frequency for Activity No. 520, where applicable.

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

533 Upgrade Existing Barrier

Description

All works associated with the upgrading of existing barrier to current standards.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>
	<i>Relevant Standard Drawings</i>

The work shall include:

- a) Removal of non-standard barrier
- b) Replacement of barrier with new to current standard.
- c) Transport of any old components to the nearest maintenance depot

Restoration Standard

The barrier shall be installed to the manufacturer's specifications.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
533	Upgrade Existing Barrier	Linear Metres

Testing Requirements

As per manufacturer's specifications and the minimum test frequency for Activity No. 520, where applicable.

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

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 Activities Nos. 522, 523, 524, 530 and 532.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>

Restoration Standard

The impact barrier furniture shall be reinstated to the manufacturer's specifications.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
534	Repair Impact Barrier Furniture	m / Dollars

Testing Requirements

As per the manufacturer's specifications.

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

550 Emergency Roadside Phone Repairs**Description**

The major repair by replacement of defective roadside emergency roadside phones.

Applicable Specification

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 No. 551 shall be repaired by replacement immediately.

Restoration Standard

Emergency phones shall be operating.

Activity Item and Unit of Measurement

Item	Description	Unit 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).
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
 - d. vehicle position.
2. Determine the work area:
 - a. from Supervisor's instruction.
3. Check phone connections:
 - a. corrosion on connection
 - b. defective handpiece.
4. Remove phone (if applicable):
 - a. install spare phone
 - b. check operation by phoning.
5. Check the work against the restoration standard.

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 Specification

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.

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

Restoration Standard

Emergency phones shall be operating.

Activity Item and Unit of Measurement

Item	Description	Unit 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).
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
 - d. vehicle position.
2. Determine the work area:
 - a. from Supervisor's instruction.
3. Check phone connections:
 - a. routine service
 - b. corrosion on connection
 - c. defective handpiece.
4. Check operation by phoning.
5. Check the work against the restoration standard.
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 Activities numbered 520, 521, 522, 523, 524, 525, 530, 532, 534, 550 and 551.

Activity Item and Unit of Measurement

559 Other Furniture Repairs Dollars

No other details are listed in the Standard for this Activity.

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
601	Replace Traffic Signal Lamps and Clean Lanterns (Bulk Change)	Each (Lamp)

No other details are listed in the Standard for this Activity.

602 Replace Traffic Signals 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
602	Replace Traffic Signals Defective Lamps and Clean Lanterns (Emergent Change)	Each (Lamp)

No other details are listed in the Standard for this Activity.

603 Replace Route Lighting Lamps and Clean Luminaries– (Bulk Scheduled)**Description**

The replacement of all route lighting lamps whether defective or otherwise and the cleaning of luminaries according to a regular maintenance program (Preventative Maintenance).

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
603	Replace Route Lighting Lamps and Clean Luminaries– (Bulk Scheduled)	Each (Lamp)

No other details are listed in the Standard for this Activity.

604 Replace Route Lighting Defective Lamps and Clean Luminaries - Individual (Unscheduled)**Description**

The replacement of any route lighting defective lamps and cleaning luminaries due to a fault call-out.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
604	Replace Route Lighting Defective Lamps and Clean Luminaries – Individual (Unscheduled)	Each (Lamp)

No other details are listed in the Standard for this Activity.

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
605	Clean Traffic Signal Lanterns - Scheduled (Bulk)	Each (Lamp)

No other details are listed in the 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
- jointing of new loop wire to existing detector feed cable

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
606	Modify Traffic Signals - Add Lanterns	Each (Lantern)

No other details are listed in the 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 finial terminals
- removal of lantern including straps

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
607	Modify Traffic Signals - Remove Lanterns	Each (Lantern)

No other details are listed in the Standard for this Activity.

608 Routine Route Lighting and Power Servicing**Description**

All routine servicing work carried out to route lights including cleaning using relamping buckets. Includes street and bridge lighting, feature lighting, lighting on pedestrian structures and crossings, and navigation lighting on bridges where applicable.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
608	Routine Route Lighting and Power Servicing	Dollars

No other details are listed in the Standard for this Activity.

609 Route Lighting and Power, General**Description**

General work carried out to route lighting facilities. Includes supply of power, routine servicing, repairs and improvements.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
609	Route Lighting and Power, General	Dollars

No other details are listed in the Standard for this Activity.

610 Routine Traffic Signal Servicing

Description

All routine traffic signal servicing work carried out to lamps including cleaning using relamping buckets. Includes routine work associated with inspection of push buttons, straightening lanterns and cleaning of field equipment.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
610	Routine Traffic Signal Servicing	Dollars

No other details are listed in the Standard for this Activity.

619 Traffic Signal Work, General

Description

General work carried out to traffic signal facilities. Includes supply of power, non routine servicing, repairs, improvements, call out activities, loop repairs, and work associated with traffic performance investigations (excludes signal co-ordination servicing).

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
619	Traffic Signal Work, General	Dollars

No other details are listed in the Standard for this Activity.

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
620	Repair Inductive Loops	Each (Joint)

No other details are listed in the 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
- jointing of new loop wire to existing detector feed cable.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
621	Inductive Loops (Recut Loops)	Each (Joint)

No other details are listed in the Standard for this Activity.

622 Replace PTF Controller**Description**

The removal of existing personality, the installation of a new personality, modification of interlock wiring and relays and viewing of at least one complete phase sequence of traffic signals to verify its correct operation.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
622	Replace PTF Controller	Dollars

No other details are listed in the Standard for this Activity.

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
623	Replace Pedestrian Crossing Push Buttons	Each (Set)/Dollars

No other details are listed in the 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 CCTV (Closed Circuit Television) Maintenance and Servicing

Details to be advised.

628 VMS (Variable Messaging Signs) Maintenance and Servicing

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
629	Routine Traffic Management Equipment Servicing	Dollars

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
630	Accident Damage, Traffic Signals	Dollars

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
631	Accident/Storm Damage- Re-aim Traffic Signal Lanterns	Each Lantern / Dollars

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
632	Accident Damage – Replace Traffic Signal Lanterns, Posts and Foundations	Each (Pole) / Dollars

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
633	Accident Damage - Replace Post and Foundations and Reinstate Lanterns from Old Pole	Dollars

No other details are listed in the Standard for this Activity.

634 Reinstatement 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
634	Reinstatement Damaged Route Lighting Poles and Lighting	Each (Pole) / Dollars

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
635	Repair Minor Damage to Electrical Pits	Each (Pit)

No other details are listed in the Standard for this Activity.

637 Replace Damaged Electrical Pit Covers**Description**

The replacement of damaged electrical pit covers with new covers. Includes the proper disposal of the damaged cover.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
637	Replace Damaged Electrical Pit Covers	Each (Lid)

No other details are listed in the Standard for this Activity.

638 Replace Damaged Electrical Pit Lids – Route Lightning

Details to be advised.

639 Replace / Repair Damaged Electrical Pits – Route Lighting

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 Item and Unit of Measurement

Item	Description	Unit of Measurement
640	Repair Damaged Electrical Pits	Each (Pit)

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
641	Repaint Traffic Signal Controller (Controller)	Each

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
642	Repaint Traffic Signal Mast Arms Including Hardware	Each (Mast Arm)

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
643	Repaint Traffic Signal Poles including Hardware	Each (Pole)

No other details are listed in the Standard for this Activity.

644 Repaint Route Lighting Poles including Hardware

Details to be advised.

650 After Hours Call Out Service – Traffic Signals**Description**

The after hours inspection of a traffic signals site due to a fault report to ascertain fault and make site safe but not including remedial action required.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
650	After Hours Call Out Service – Traffic Signal	Dollars

No other details are listed in the Standard for this Activity.

651 After Hours Call Out Service – Route Lighting Signals**Description**

The after hours inspection of a route lighting site due to a fault report to ascertain fault and make site safe but not including remedial action required.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
651	After Hours Call Out Service – Route Lighting	Dollars

No other details are listed in the Standard for this Activity.

660 Electrical Safety Inspections – Traffic Signals**Description**

Electrical safety inspections carried out on traffic signals.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
660	Electrical Safety Inspections – Traffic Signals	Dollars

No other details are listed in the Standard for this Activity.

661 Electrical Safety Inspections – ITS Devices Signals**Description**

Electrical safety inspections carried out on ITS devices.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
661	Electrical Safety Inspections – ITS Devices	Dollars

No other details are listed in the Standard for this Activity.

662 Electrical Safety Inspections – Route Lighting**Description**

Electrical safety inspections carried out on route lighting.

Applicable Specifications

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
662	Electrical Safety Inspections – Route Lighting	Dollars

No other details are listed in the Standard for this Activity.

700 TRAFFIC DELINEATION

701 *Repaint Road Centre Lines, Minor*

702 *Repaint Road Centre Lines, Major*

703 *Repaint Double Barrier Lines, Daywork*

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 w*

Details to be advised.

709 *Repaint Double Barrier Line, General*

710 *Repaint Road Edge Lines, Minor*

711 *Repaint Road Edge Lines, Major*

712 *Repaint Edge Line - 100mm Width*

713 *Repaint Edge Line - 150mm Width*

714 *Repaint Unbroken Lane Line, General*

719 *Repaint Single Barrier Line, General*

720 *Repaint Single Broken Lines*

721 *Repaint Barrier Broken Lines*

722 *Repaint Broken Lane Line, General*

723 *Repaint Continuity Line, General*

724 *Repaint Broken Line, General*

725 *Repaint 150mm Outline, General*

Description

All work associated with the renovation of road line marking. Includes sweeping, spotting, symbolising and repainting.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>

Restoration Standard

The road marking shall be reinstated to the standard for the original marking and in accordance with the specifications and *Manual of Uniform Traffic Control Devices*.

Activity Items and Units of Measurement

Item	Description	Unit of Measurement
701	Repaint Road Centre Lines, Minor	Line km
702	Repaint Road Centre Lines, Major	Line km
703	Repaint Double Barrier Line - 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 100mm 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 per Lot
Line Thickness	1 per 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's approval).
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
 - 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
 - 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 standard.
7. Check markings are dry.
8. Leave work site safe and tidy:
 - a. remove all loose material.
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 Item and Unit of Measurement

Item	Description	Unit of Measurement
729	Urban Line Marking - Minor	m ²

No other details are listed in the standard for this Activity.

730 Repaint Lateral Markings

Description

All work associated with the renovation of lateral road line marking. Includes sweeping, spotting, symbolising and repainting.

Applicable specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>

Activity Items and Units of Measurement

Item	Description	Unit of Measurement
730	Repaint Lateral Markings	m ²

No other details are listed in the Standard for these Activities.

731 Remark Road Markings**Description**

The renovation or replacement of road marking. Includes 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>Manual of Uniform Traffic Control Devices (Queensland)</i>

Restoration Standard

The road marking shall be reinstated to the standard for the original marking and in accordance with the specifications and Manual of Uniform Traffic Control Devices.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
731	Remark Road Markings	m ²

Testing Requirements

Minimum test frequency	
Line Width	1 per Lot
Line Thickness	1 per Lot

Lot definition being one Works 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 engineer's approval.
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
 - 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
 - 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 standard.
7. Check markings are dry.
8. Leave work site safe and tidy:
 - a. remove all loose material.
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 Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>

Restoration Standard

The road marking shall be reinstated to the standard for the original lines or marking and/or in accordance with the specifications and Manual of Uniform Traffic Control Devices.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
735	Thermoplastic Line Marking	m ²

Testing Requirements

Minimum test frequency	
Line Width	1 per Lot
Line Thickness	1 per Lot

Lot definition being one Works 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's approval).
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
 - 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
 - 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 standard.
7. Leave work site safe and tidy:
 - a. remove all loose material.
8. Remove traffic control:
 - a. clean/repair as necessary.

736 Audio Tactile Line Marking (ATLM)

Description

All works associated with the use of audiotactile materials to mark new lines or markings or retreat existing lines or markings.

Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
736	Audiotactile Linemarking	Line Kms

No other details are listed in the standard for this Activity.

740 Raised Pavement Markers

Description

The installation of new or replacement of missing raised pavement markers. Includes the supply of markers.

Applicable Specifications

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>
MRTS45	<i>Road Surface Delineation</i>
-	<i>Manual of Uniform Traffic Control Devices (Queensland)</i>

Restoration Standard

The raised pavement markers shall be installed replaced to the requirements of Specification MRTS14 and the *Manual of Uniform Traffic Control Devices*.

Activity Item and Unit of Measurement

Item	Description	Unit 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's approval).
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
 - 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
 - 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
 - b. press marker so adhesive squeezes out all round.
6. Check the work against the restoration standard.
7. Leave work site safe and tidy:
 - a. remove all loose material.
8. Remove traffic control:
 - a. clean/repair as necessary.

745 Remove Unwanted Road Lines

Description

All work associated with the removal of unwanted road lines.

Applicable Specification

Reference	Title
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 Works Order.

Restoration Standard

The road line shall be ground off or otherwise treated so that the treated area will not be mistaken for a line.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
745	Remove Unwanted Road Lines	m ²

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.
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
 - 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 standard.
7. Leave work site safe and tidy:
 - a. remove all loose material.
8. Remove traffic control:
 - a. clean/repair as necessary.

750 *Remove Unwanted Markings*

Description

All works associated with the removal of unwanted road markings.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS45	<i>Road Surface Delineation</i>

The marking shall be removed to the requirements set out in the Works Order.

Restoration Standard

The marking shall be ground off or otherwise treated so that the treated area will not be mistaken for a marking.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
750	Remove Unwanted Markings	m ²

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.
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
 - 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 standard.
7. Leave work site safe and tidy:
 - a. remove all loose material.
8. Remove traffic control:
 - a. clean/repair as necessary.

759 Line Marking, General

Description

Any linemarking works not covered by Activities numbered 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>
MRTS45	<i>Road Surface Delineation</i>

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
759	Line Marking, General	Dollars

No other details are listed in the standard for this Activity.

760 Paint New Lateral Markings, Bikeways

Details to be advised.

770 Retro Reflectivity Testing

Details to be advised.

800 STRUCTURES**809 Routine Bridge Servicing (RAMC)**

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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
815	Replace/Repair Expansion Joints (Concrete)	m

No other details are listed in the Standard for this Activity.

819 Bridgework, Other Structural (Concrete)**Description**

All other structural works carried out to concrete components of bridges not covered by Activities numbered 801, 815 and 851.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
819	Bridgework, Other Structural (Concrete)	Dollars

No other details are listed in the Standard for this Activity.

820 Clean / Repaint Steel Elements**Description**

The preparation by appropriate cleaning and repainting of steel elements of bridge structures.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
820	Clean/Repaint Steel Elements	Dollars

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
822	Repair Minor Damage to Steel Elements	Dollars

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
823	Replace/Repair Expansion Joints (Steel)	m

No other details are listed in the 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 Activities numbered 822 and 823.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
829	Bridgework, Other Structural (Steel)	Dollars

No other details are listed in the Standard for this Activity.

833 Reinstatement Timber Piles**Description**

All works associated with the removal and replacement or splicing of deteriorated unserviceable timber piles of bridge structures.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
833	Reinstatement Timber Piles	Metres Length/Dollars

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
834	Repair/Replace Timber Corbels	Each (Corbel)

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
836	Replace Timber Girders	Each (Girder)

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
837	Replace Deck Planks with New Planks	square metres

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
838	Repair/Replace Kerbs	Linear Metres

No other details are listed in the Standard for this Activity.

849 Bridgework, Other Structural (Timber)**Description**

All other structural works carried out to timber components of bridges not covered by Activities numbered 803, 833, 834, 835, 836, 837, 838 and 852.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
849	Bridgework, Other Structural (Timber)	Dollars

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
850	Replace/Repair Relieving Slabs	Dollars/Cubic Metres

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
851	Repair Spalled and Cracked Structural Concrete Elements (Concrete Bridges)	Dollars

No other details are listed in the 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. Includes concrete kerbs and rail supports.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
852	Repair Spalled and Cracked Structural Concrete Elements (Timber Bridges)	Dollars

No other details are listed in the 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. Includes concrete kerbs and rail supports.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
853	Repair Spalled and Cracked Structural Concrete Elements (Steel Bridges)	Dollars

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
855	Repair/Replace Batter Protection	Dollars

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
859	Bridgework, General	Dollars

No other details are listed in the standard for this Activity.

860 Routine Grid Servicing**Description**

All work of a routine nature necessary to maintain a sound and effective grid. Includes de-silting of the opening and up keep of grid hazard signs.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
860	Routine Grid Servicing	Dollars

No other details are listed in the Standard for this Activity

861 Repair or Replace Grids**Description**

All works associated with the repair of defective grids. Includes structural repair to rails and bearers and may involve complete structural replacement.

Applicable Specification

Reference	Title
MRTS02	<i>Provision for Traffic</i>
MRTS14	<i>Road Furniture</i>

Restoration Standard

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.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
861	Repair or Replace Grids	Dollars

Supplementary Work Items and Units of Measurement

Supplementary Work Item	Description	Unit of Measurement
	Grid: repair	lump sum
912100	Provision for traffic	lump sum
963100	Grid: removal of the existing structure	each
963200	Grid: excavation work	m ³
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

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.
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
 - c. vehicle position.
2. Determine grids to be repaired:
 - a. from supervisor's instructions.
3. Repair grid:
 - a. in accordance with details in works order.
4. Check the work against the restoration standard.
5. Leave work site safe and tidy:
 - a. remove all loose material
 - b. no material to block drains.
6. Remove traffic control:
 - a. clean/repair as necessary.

862 Widen / Replace Narrow Grids

Description

Widening or replacement of grid structures due to inadequacy or poor structural condition. Work includes removal and disposal of old grid and construction of new grid including fencing requirements where appropriate.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
862	Widen / Replace Narrow Grids	Dollars

No other details are listed in the Standard for this Activity.

863 Clean / Maintain Drainage Components

Details to be advised.

864 Tighten Existing Bolts – Steel and Concrete Structure

Details to be advised.

865 Rail Crossing Servicing**Description**

All works of a routine nature necessary to maintain a sound crossing. Includes pavement repairs where the defect has resulted from the presence of the rails.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
865	Rail Crossing Servicing	Dollars

No other details are listed in the standard for this Activity.

870 Repair Noise Barriers**Description**

All work associated with the repair of roadside noise barrier fencing.

Applicable Specification

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
6. Transport of old components to the nearest maintenance depot.

Restoration Standard

The fencing shall be repaired to the requirements set out in the Works Order.

Activity Item and Unit of Measurement

Item	Description	Unit 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.
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions.
3. Repair barrier fencing:
 - a. straighten posts
 - b. replace damaged components.

4. Check if painting is required:
 - a. if required advise supervisor.
5. Check the work against the restoration standard.
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, Retaining Structures and Protective Treatments</i>
MRTS70	<i>Concrete</i>

Restoration Standard

The restraining structures shall be repaired to the standards specified for new work in Specification MRTS03 and MRTS70. All excess material shall be disposed of outside the road reservation.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
875	Repair of Restraining Structures - Gabions, Reinforced Walls	m ²

Testing Requirements

Minimum test frequency	
Concrete - Slump Q451A	< 4 m3 No requirement
Compressive Strength Q455	> 4 m3 As per MRS70
Geometrics	
Specified Tolerances	As per MRTS03
Maximum Lot Size	Works Order

WORK PREPARATION

Plant Requirements

Job truck

Bobcat/backhoe/loader

Concrete saw/pavement breaker

Materials

Gabions as per MRTS03

Rock as per MRTS03

Concrete or concrete material as per MRTS70

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.
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
 - 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 works order.
4. Check the work against the restoration standard.
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 Waterway

Details to be advised.

879 Maintain Clear Waterway

Details to be advised.

880 Repair Roadside Fences**Description**

All work associated with the repair of roadside fencing.

Applicable Specification

Reference	Title
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
6. Transport of old components to the nearest maintenance depot

Restoration Standard

The fencing shall be repaired to the requirements set out in the Works Order.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
880	Repair Roadside Fences	m

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.
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
 - d. vehicle position.
2. Determine the work area:
 - a. from supervisor's instructions.
3. Repair fencing:
 - a. straighten posts
 - b. replace damaged components.

4. Check if painting is required:
 - a. if required advise supervisor.
5. Check the work against the restoration standard.
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 / Guardrail Furniture*

Details to be advised.

885 *Make Safe Accident Damage to Handrail / Barrier / Guardrail*

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 Contamination from Steel Girder*

Details to be advised.

889 *Emergency Pavement Repairs on Structures (<100*

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.

899 *Other Miscellaneous Structure Work*

Description

Any other work carried out to miscellaneous structures not covered by Activities numbered 860, 861, 862, 865, 870, 875, 880, 890 and 891.

Applicable Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
899	Other Miscellaneous Structure work	Dollars

No other details are listed in the 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 Specification

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

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
901	RMPC Joint Maintenance Requirement Assessment	Dollars

No other details are listed in the Standard for this Activity.

902 *Open Tender Establishment Setup Works*

Details to be advised.

903 *Inspections for Forward List of Work*

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 *Prepare Cultural Heritage Management Plan*

Details to be advised.

908 *Implement, Monitor and Maintain 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 publication "Road Project Environmental Management 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
 - 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
- 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,

- Develop location specific procedures, where warranted, in accordance with Departmental Standards or as agreed by the Principal and the Contractor.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
910	Preparation of Environmental Management Plan (Maintenance)	Dollars

No other details are listed in the 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, and
- Monitoring and reporting of environmental performance against objectives and standards, and
- Payment of all fees due under all Acts, Regulations and By-laws.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
911	Implementation, Monitoring and Maintenance of Environmental Management Plan (Maintenance)	Dollars

No other details are listed in the 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
- 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 Item and Unit of Measure

Item	Description	Unit of Measurement
912	I Payment of Fees/Permits (Environmental)	Dollars

Testing Requirements

Nil.

Particular Points to Consider

1. 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
920	Electricity Supply, Traffic Signals	Dollars

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
921	Electricity Supply, Lighting	Dollars

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
922	Phone Charges, Traffic Signals	Dollars

No other details are listed in the 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
923	Phone Charges, Traffic Signals Co-ordination	Dollars

No other details are listed in the Standard for this Activity.

930 Modify and Digitise 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
930	Modify and Digitise Computerised As Constructed Plans	Dollars/Each (Plan)

No other details are listed in the Standard for this Activity.

931 Modify 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 Item and Unit of Measurement

Item	Description	Unit of Measurement
931	Modify Paper-based As Constructed Plans	Dollars/Each (Plan)

No other details are listed in the 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**

All works associated with damage recovery, including liaising with insurance companies, individuals, etc.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
950	Damages Recovery	Dollars

No other details are listed in the Standard for this Activity.

960 Alliance Performance Limb Payment**Description**

All works associated with alliance performance limb payment.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
960	Alliance Performance Limb Payment	Dollars

No other details are listed in the Standard for this Activity.

970 Licence and Ongoing maintenance fees for TMR accepted Maintenance Management System**Description**

Ongoing MMS licence fee, maintenance / replacement cost of MMS field equipment.

Activity Item and Unit of Measurement

Item	Description	Unit of Measurement
970	Licence and Ongoing maintenance fees for TMR accepted Maintenance Management System	Dollars

Maximum amount per MMS per year is \$5,000.

No other details are listed in the Standard for this Activity.

