

PART M11**MAINTENANCE – UNSEALED ROADS****CONTENTS**

1. General
2. Quality Requirements
3. Maintenance Grading
4. Additional Requirements
5. Hold Points

Attachment 1: Maintenance Activity Standards
Attachment 2: Pavement and Fencing Types
Attachment 3: Floodway Design
Attachment 4: Unsealed Roads Level of Service
Attachment 5: Turkey Nest Plans

1. GENERAL

This Part specifies the requirements for maintenance activities for unsealed roads.

2. QUALITY REQUIREMENTS

The Contractor shall prepare and implement a Quality Management Plan vide Part PC-QA1 “Quality Management Requirements” that includes detailed procedures, documentation and Work Instructions for all maintenance activities in addition to the below:

- a) test method for determining the retro reflective luminance;
- b) procedure for Emergency Response in regards to events such as flooding, fire and natural disaster;
- c) procedure for Emergency Response for the repair of bull dust holes; and
- d) Work Instructions for graffiti removal including colour matching and the assurance that the retro reflective luminance on signs is not reduced.

This documentation shall be submitted during the Mobilisation Period at least 28 days prior to the commencement of the Maintenance Period.

The requirements of M1 Clause 12.4 (a) do not apply to unsealed roads.

3. MAINTENANCE GRADING**3.1 Maintenance Grading General**

The Contractor shall conduct wet or dry maintenance grading to a standard that ensures the road is in a safe and trafficable condition, without corrugations, protruding rocky outcrops, rough areas, or potholes and shall grade in any loose material from the side (drain or shoulder) of the road.

The importing of new material is not permitted unless approved by the Superintendent. On completion of the grading no windrow of material shall remain.

Side drains are to be cut when directed by the Superintendent. The recovered material from the side drains will either be used in the formation if required and the material is suitable, or placed on the batters.

The grading road width shall not exceed the widths specified in Attachment 4 Unsealed Roads Level of Service unless directed or specified in a Work Order. The Contractor shall determine the number of passes required to provide grading to the nominated width. Grading shall be single cut unless otherwise directed by the Superintendent.

Where the Contractor is directed to double cut a section of road, the Contractor must grade the determined number of passes twice e.g. if a section of road is graded using 3 passes to obtain a nominated road width of 5 m then the term double cut means an additional 3 passes.

Maintenance grading of road sections must be completed during a shift. Windrows of rocks, debris and other materials must not be left on the roadway at the end of a shift, overnight, or during any work breaks. No windrows of material are to be left along the sides of the road when the roadworks are complete.

The Contractor must ensure that drain entrances and floodways are kept clear when undertaking maintenance grading.

Maintenance grading works shall match in with existing side roads.

The Contractor must prevent material being graded into cattle grids by grading away from the structure and must also prevent any step or rideability issues at the grid.

Maintenance grading is an SMS activity.

3.2 Dry Maintenance Grading

3.2.1 Crossfall

The Contractor shall make every effort to maximise crossfall with the available material and shall not introduce an inverted profile.

3.2.2 Dry Grading after Wet Weather to Improve Shape

Maintenance grading rectification works to improve the road shape may be conducted to sections of unsealed roads that have lost shape over time or have an inverted shape.

It is intended that these works be undertaken after wet weather when moisture is in the material. No additional items of plant or any other resources are required for this work above the requirements for dry grading.

The Contractor shall provide a site specific methodology that at a minimum is to include:

- a) selection of the section of road to be remedied;
- b) moisture content of the existing road materials;
- c) use of windrow material along the section of road to be remediated; and
- d) formation of side and cut-off drains as part of the works.

It is intended that the road shape will become positive in crossfall after a series of maintenance grades using this approach.

3.3 Wet Maintenance Grading

Wet maintenance is carried out for the preservation of formed and also formed and sheeted road surfaces and is likely to occur to reinstate loss of cross-fall, improve the shape, surface and compaction, minimise dust and ensure that water drains away from the road surface.

The Contractor shall use bores nominated by the Superintendent and utilise existing Turkey Nests where available as provided in the **Contract Specific Requirements**.

3.3.1 Wet Maintenance Class 1

Where the existing road surface is deteriorated but crossfalls are greater than 2%, the Contractor shall apply water, slurry the road surface, grade, shape and roll with a multi tyred roller to provide a finished surface that is tight, compacted, and free from defects and soft spots.

3.3.2 Wet Maintenance Class 2

Where the existing road surface is losing shape, or is losing material through ravelling or potholing, the road surface shall be watered and ripped to the greater of either the depth of the existing pavement material or up to a maximum of 100 mm. Sheetting material in windrows and drains is to be brought back onto the road surface, remixed, relayed, and tightly compacted. This work may also include where directed, reformation and clearing of any existing side drains.

3.3.3 Cross fall

A two-way cross fall between 3% minimum and 5% maximum shall be provided, except on sections of road that have an existing one-way cross-fall, including superelevated curves. Floodways shall have a one-way cross-fall of 1% in the direction of the water flow. Finished road surfaces are to be tight, compacted, and free from defects and soft spots.

The Contractor must check the cross falls at 3 m left and right of the centre line at 100 m intervals along the section of road, and record these measurements. Cross-fall check measurements shall be provided to the Superintendent, in Microsoft Excel spreadsheet format, within one week of measurements being taken or before the Contractor leaves site.

4. ADDITIONAL REQUIREMENTS

4.1 Mobilisation of Mobile Grading Camps

Payment for camp and crew relocation for grading activities will be in accordance with the Schedule of Rates. Measurement will be based on distance from the existing campsite to the next nominated campsite. No separate payment will be made for travel at the start and end of any work period.

4.2 Surface Treatment of Sealed Pavement

All spray seal pavement repairs shall include 150 mm overlap outside the perimeter of the repair to 'match in' with the existing surface and to prevent water ingress.

Care should be taken to ensure longitudinal joints for pavement repairs are not within the wheel paths.

4.3 Size of Repairs of Sealed Pavement

The Contractor shall include distressed pavement immediately surrounding the defect in the repair, regardless of the intervention parameters (i.e. the area of pavement repair at recording shall be the area required to meet the Performance Standards). Measurement of the area of repair on pavements with a sprayed bituminous surface shall not include the 150 mm overlap required for the surface treatment 'match in'.

4.4 Pavement Deterioration of Sealed Pavement

The Contractor shall:

- a) ensure the deterioration of recorded Defects does not create a safety hazard to road users; and
- b) repair pot holes occurring within recorded Pavement Defects.

4.5 Sealed Pavement Cleaning

After significant weather events, sand, silt, debris and other materials may be deposited on or across the roads. Depending upon the quantity of material deposited on the trafficked way, removal may be required by loader or similar item of plant as well as brooming to expose the trafficked surface.

The Contractor will inspect the affected sites within 3 days and will sign any Traffic Hazards. The signage must remain until the hazard has been rectified.

The Contractor must use dust suppressing equipment/methods adjacent to sensitive locations such as housing, schools and hospitals or where dust is likely to cause a nuisance to nearby residents or businesses.

4.6 Clearing of Drains

The clearing of existing cut-off drains and the construction of new cut-off drains will only be undertaken as directed by the Superintendent.

Existing cut-off drains are not to be extended unless approved by the Superintendent. New cut-off drains shall be pegged for approval by the Superintendent prior to the new drains being constructed.

Any vegetation within existing cut-off drains shall be removed as part of the drain clearing operations.

The cleaning and clearing of existing side drains along the side of the road will only be undertaken as part of the grading of the road. The Contractor must inform the Superintendent if they observe any cut off drains that are significantly blocked by excess material or vegetation.

Other than clearing culverts, cut-off drains and side drains, any Work within a watercourse and/or wetland shall constitute a **HOLD POINT**.

4.7 Batter Grading

Batters shall be graded at the angle of the natural batter material, or flatter or as directed by the Superintendent. All windrowed material from the batter grading will be pushed behind the existing batter. If the waste material contains excess vegetation the Contractor must dispose of this material in accordance with Part M15 "Vegetation Maintenance Controls".

Vegetation that has established on the batters at a height of < 1500 mm, including any small shrubs and trees shall be removed as part of the batter grading operation. The Superintendent should be advised of any vegetation of a height > 1500 mm that has established on the batters for a direction regarding its retention or removal.

Batters shall be graded so as to maintain road width. Where batter encroachment has reduced road width to below the required minimum, Works to widen the road may be undertaken.

4.8 Turkey Nest Dams

When directed, the Contractor shall construct a turkey nest dam. Turkey nest dams shall be fitted with an overflow pipe and a plastic liner. The Contractor is to determine the size of the turkey nest per location as this will be subject to the potential water flow rate of the bore. No separate payments will be made for mobilisation or demobilisation, pump running costs, disposal of removed vegetation or any other ancillary Works required as part of the turkey nest construction. Turkey Nest Plans are provided in Attachment 5.

Heavy duty permanent mesh fencing (at a height of 1800 mm) shall be installed around the turkey nest prior to filling with water. No Entry signs and No Swimming signs shall be secured to the four fence lines. As a minimum safety precaution, an emergency recovery point must be installed and maintained in working condition, secured to an adequate anchor-point at a suitable location and extend down the battered face of the turkey nest dam to the floor of the dam. Signage is to be installed highlighting the location of the anchor point.

Works associated with the construction of the turkey nest dam shall also include:

- a) construction and maintenance of an access track leading to and around the turkey nest dam;
- b) a suitable layover area;
- c) the installation and maintenance of the liner for the duration of the Contract;
- d) trenching and laying of poly pipe from bore head to the dam (allowance for up to 1 km distance between the bore and the turkey nest);
- e) supply and maintenance of pumps for extraction of water from the bore and the turkey nest; and
- f) maintenance of the entire area for the duration of the Contract.

When directed, the Contractor shall remove the turkey nest dam and rehabilitate the site to its original condition including removal of pipes and access tracks.

4.9 Bores

Notwithstanding Part M1 Clause 12.4 and Part M8 Clause 11.1 the Principal will obtain all necessary approvals for new bores. The Contractor will be required to drill the bore and payment for this work will be in accordance with the Schedule of Rates. Separate payment will also be made for mobilisation and demobilisation of the drilling equipment for the drilling of the bores at the rates established in the Schedule of Rates. Measurement will be based on distance from the nearest depot to the bore hole or distance from bore hole to bore hole.

Any flow rates if provided by the Principal for new or existing bores are indicative only and the Contractor must determine the actual flowrate and manage the extraction of water for all maintenance and construction Works.

The Principal will make available all approved functioning bores for the duration of the Contract excluding all equipment. All Principal owned bores may also be shared with the local pastoralists.

4.10 Raising of Pavement Material

The Contractor shall undertake the raising of pavement material from approved local borrow pits for use in the formation, maintenance and sheeting of roads. Material shall be stockpiled within the limits of the approved total pit area in a manner that can be readily measured accurately and at a location in close proximity to the pit that allows ready access for safe loading and travel for trucks between the stockpile and the work-site/road.

The Works require the Contractor to strip any vegetation and topsoil from the pit area and the access track, raise and work the material to be useable and workable on the road, develop the pit to the specified requirements including side batters, stockpile the product, and construct an access track to haul materials from the stockpile to the work-site/road.

All vegetation stripped from the pit site and the access track shall be stockpiled on site within the approved total pit area, as directed by the Superintendent.

Topsoil shall be stockpiled along selected sections of the pit perimeter, without interfering with pit access, for spreading at a later date over the disturbed pit surface when all material has been raised and removed from the pit floor. If an access track is required, topsoil shall be removed from the track alignment and windrowed along one side of the track in readiness for re-spreading if required.

The access track shall extend between the stockpile site and the work-site/road and the access track alignment shall be as directed by the Superintendent.

The access track shall be maintained during material hauling operations.

The pit shall be developed in a way that results in battered sides of not less than 1 vertical to 4 horizontal and with a defined ramp that provides easy removal of the raised material from the pit. If the material is won from an old or previously established borrow pit, the approved total pit area shall be rehabilitated to the standard required in this Contract. This rehabilitation work shall also include removal of any rubbish left around the site from previous operations.

Once all material has been exhausted from the pit and the pit can no longer be utilised, all site rehabilitation to the pit, its surroundings, and the access track shall be completed to the satisfaction of the Superintendent. The Contractor is to re-spread the topsoil across the floor and battered sides of the material pit and the access track.

Payment for all works associated with raising of pavement materials shall be paid for at the rates established in the Schedule of Rates. The cubic metre quantity of material to be raised will be the total amount required in a single establishment of the plant.

Separate payment will be made for mobilisation and demobilisation of equipment only for the raising of the pit material at the rates established in the Schedule of Rates. Measurement will be based on distance from the nearest depot to the borrow pit or distance from borrow pit to borrow pit.

The Contractor shall allow for NATA sampling and testing for material Grading and Plasticity Index (PI).

The Superintendent may require further NATA material testing of the raised materials at various times. Payment for additional testing will be in accordance with the Schedule of Rates.

4.11 Waste Disposal

The Contractor shall dispose of waste materials in accordance with M8 Clause 10 “Waste Management”.

4.12 Litter

Litter visible from the travelled way and within the Maximum Cleared Width (refer Attachment 4 Unsealed Roads Level of Service) shall be removed at frequency specified in the Maintenance Activity Standards.

The Contractor shall dispose of litter materials in accordance with M8 Clause 10 “Waste Management”.

To remove any abandoned vehicles, the Contractor shall follow Operational Instruction 20.22 “*Disposal of Abandoned Vehicles*” at <https://www.dpti.sa.gov.au/standards/tass> and notify SAPOL.

5. HOLD POINTS

The following is a summary of the Hold Points, vide Part PC-QA1 “Quality Management Requirements”, referenced in this Part.

CLAUSE REF.	HOLD POINT	RESPONSE TIME
4.6	Work within a watercourse and/or wetland area.	28 days

ATTACHMENT 1**MAINTENANCE ACTIVITY STANDARDS**

UDC/UDR	Clear Drainage Elements
UGC/UGD	Clear Cattle Grids
USS	Scour Repair
UPE	Sealed Edge Break Repair
UPK	Sealed Crack Sealing
UPJ	Sealed Pavement Digouts
UPD	Minor Pavement Defect
UPT	Sealed Pavement Surfacing
UPW	Sealed Pavement Sweeping
UBH	Bull Dust Hole Repairs
UGR	Grading of Unsealed Roads
UFD	Delineators
UFR/UFS	Signs
UMG	Graffiti Removal

CLEAR DRAINAGE ELEMENTS (UDC / UDR)

Application: This standard applies to all infrastructure that provides the road network drainage function.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
<p>Routine Maintenance: Vegetation growth affecting drainage elements.</p> <p>Cyclical Routine Maintenance: Nil</p> <p>Specific Maintenance: Loss of capacity or blocked drainage elements.</p> <p>Broken, damaged, cracked or spalled drainage elements, and subsidence under drainage units.</p>	<p>Defects that restrict the capacity of the drainage element by 50%.</p> <p>Vegetation exceeding 450 mm high within 3m of drainage elements.</p> <p>MDR Recording: Routine Maintenance Defects shall be recorded on the MDR as UDC.</p> <p>Specific Maintenance shall be recorded on the MDR as UDR</p>	60 Days	All	<p>Culverts and connecting Drains: Defects that restrict the capacity of the drainage element more than 70% or causing flooding to the roadway or adjacent property.</p>	<p>Culverts and Pits and Connecting Drains: Operating at 100% of the design capacity.</p> <p>Environmental: No vegetation impeding waterway.</p> <p>No vegetation > 150 mm high within 3m of a structural drainage element.</p> <p>Prevention of sedimentation of waterways when undertaking work.</p> <p>Removal of seedling trees causing potential damage to drainage infrastructure.</p>

CLEAR CATTLE GRIDS (UGC / UGD)

Application: This standard applies to the clearing of cattle grids.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
<p>Routine Maintenance: Vegetation growth in the area of grid affecting the cattle grid's functionality.</p> <p>Loss of capacity or blocked cattle grids.</p> <p>Cyclical Routine Maintenance: Nil.</p> <p>Specific Maintenance: Collapsed or broken or corroded cattle grids or steels.</p>	<p>Cattle Grids full to more than 70% of its capacity.</p> <p>Vegetation exceeding 450 mm high within 3m of cattle grids.</p> <p>Collapsed or broken or corroded cattle grids or steels.</p> <p>MDR Recording: Routine Maintenance Defects shall be recorded on the MDR as UGC.</p> <p>Specific Maintenance shall be recorded on the MDR as UGD.</p>	60 Days	All	<p>Grids structures and Drains: Grids full to the bottom of the rail steels.</p> <p>Hazardous, misalignment or condition of any cattle grid unit making it unsafe.</p>	<p>Grids- Structures and Drains: No broken, misaligned or ineffective grids.</p> <p>No damaged or ineffective signage.</p> <p>Capacity:- Cattle grids operating at 100% of their capacity.</p> <p>Environmental: No vegetation impeding sight of the grids or their drain capacity (if the cattle grid serves as a drain).</p>

SCOUR REPAIR (USS)

Application: This standard applies to scour occurring within the road pavement surface, shoulders, batters and drainage elements.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Nil Cyclical Routine Maintenance: Nil Specific Maintenance: Scour or siltation of road pavement, batters, drains, embankments, levee banks, shoulders, or against structures draining the road.	Defects within the road pavement: average depth exceeding 100mm and average width exceeding 100mm. Defects within the road shoulder: average depth exceeding 150mm and average width exceeding 150mm. Defects in the batter / drainage elements mean depth exceeding 300 mm and width exceeding 300 mm. MDR Recording: Specific Maintenance shall be recorded on the MDR as USS.	n/a	All	Not applicable.	Profile: to "match in" with the adjacent profile. Hydraulic efficiency: match the upstream condition. Stability: Embankments stabilised. Backfill: in shoulders shall conform to USG / USR.

SEALED EDGE BREAK REPAIR (UPE)**Application:** This standard applies to the reinstatement of nominal edge of seal

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: The 'edge of seal' is broken or irregular. Edge drops. Cyclical Routine Maintenance: Nil. Specific Maintenance: Nil.	<ul style="list-style-type: none"> Broken seal exceeding 100 mm from the nominal edge of seal; or Edge drop > 50 mm. MDR Recording: Defects shall be recorded on the MDR as UPE.	90 Days	All	Not Applicable	Longitudinal and Transverse: Deformation in the reinstated edge shall be $\leq 40\text{mm}$ under a 1.2 m straight edge. Shape: The edge repair shall maintain the crossfall of the adjacent traffic lane. Longitudinally the edge repair shall 'feather' into the existing seal, such that the edge of seal forms a continuous smooth line. The repair shall be flush with the existing pavement at the join. Surface: The finish of the final surface shall match the existing surfacing. Permeability: The repair shall ensure water resistance.

SEALED CRACK SEALING (UPK)

Application: This standard applies to the sealing of cracks or joints in the sealed pavement surface.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Nil. Cyclical Routine Maintenance: Nil. Specific Maintenance: Cracking includes the following types: block, crescent shaped, crocodile, diagonal, longitudinal, meandering and transverse as defined in the Austroads "Guide To Visual Assessment of Pavement Condition".	Cracks width > 3 mm. Crocodile cracking > 1 m ² . MDR Recording: Specific Maintenance shall be recorded on the MDR as UPK.	n/a	All	Not applicable.	Shape: The resultant surfacing shall be uniform and "level" with the road surface. Surface: The skid resistance of the surface shall not be reduced by the treatment. Permeability: The repair shall ensure water resistance.

SEALED PAVEMENT DIGOUTS (UPJ)

Application: This standard applies to the repair of sealed pavement failures.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Nil. Cyclical Routine Maintenance: Nil. Specific Maintenance: Shoving, depressions, corrugations, rutting, lumps or ridges with cracking or pumping.	Defects with deformation > 20 mm under a 1.2 m straight edge in any direction. MDR Recording: Defects shall be recorded on the MDR as UPJ.	n/a	All	Not applicable	Shape: Deformation of the surface shall be ≤ 10 mm in a longitudinal and transverse direction under a 1.2 m straight edge. Pavement: The repair shall have the equivalent mechanical properties to the adjacent pavement. Surface: The finish of the final surface shall match the existing surfacing. Permeability: The repair shall ensure water resistance.

MINOR PAVEMENT DEFECT (UPD)

Application: This standard applies to the repair of all small sealed pavement failures.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
<p>Routine Maintenance: All pavement failures including potholes, and small delaminations <1 m² in area.</p> <p>Defects that extend to the full depth of the wearing course.</p> <p>Cyclical Routine Maintenance: Nil.</p> <p>Specific Maintenance: Nil.</p>	<p>Defects in carriageway:</p> <ul style="list-style-type: none"> • that extend to the full depth of the wearing course; or • with deformation > 20mm under 1.2m straight edge in any direction. <p>MDR Recording: Defects shall be recorded on the MDR as UPD.</p>	28 days	All	Depth of failure is greater than 100 mm.	<p>Shape: The perimeter of the repair shall be flush with the existing surface and of regular shape.</p> <p>Pavement: The repair shall comprise materials that are compatible with, or of better quality than the existing pavement.</p> <p>Surface: The finish of the final surface shall match the existing surfacing.</p> <p>Permeability: The repair shall ensure water resistance.</p>

SEALED PAVEMENT SURFACING (UPT)

Application: This standard applies to the repair of the pavement surface.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
<p>Routine Maintenance: Nil.</p> <p>Cyclical Routine Maintenance: Nil.</p> <p>Specific Maintenance: Flushing, ravelling, stripping, delamination, or crocodile cracking where deformation has not reached the Intervention Level for pavement digouts and > 100 m².</p> <p>Crocodile cracking, where the average least dimension of the cells is greater than 300 mm and crack width > 3mm shall be repaired in accordance with Activity UPK.</p>	<p>Crocodile cracking: > 1 m².</p> <p>Cracking: of width < 3 mm with visual inspection of 'pumping of fines'.</p> <p>Bleeding binder: Distressed area over 20 m length in wheel path.</p> <p>Seal stripping: 30% Loss of aggregate over area of 100 m².</p> <p>MDR Recording: Defects shall be recorded on the MDR as UPT.</p>	n/a	All	Not applicable	<p>Shape: Deformation of the surface shall be ≤10 mm in a longitudinal and transverse direction under a 1.2 m straight edge.</p> <p>Pavement: The repair shall have the equivalent mechanical properties to the adjacent pavement.</p> <p>Surface: The finish of the final surface shall match the existing surfacing.</p> <p>Permeability: The repair shall ensure water resistance.</p>

SEALED PAVEMENT SWEEPING (UPW)

Application: This standard applies to the removal of loose material from the sealed road surface and around road furniture during loop inspections.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Accumulations of aggregate, sand, dirt and other detritus occurring: <ul style="list-style-type: none"> on pavement, or shoulders; or surrounding bases of poles or posts greater or equal to 100 mm diameter. Cyclical Routine Maintenance: Nil. Specific Maintenance: Nil.	Defects exceeding: <ul style="list-style-type: none"> 5m² in townships; or 40m² in other locations (e.g. Floodways). Defects covering 20 m length of edge line. Defects reducing skid resistance. Defects on structures diverting water flow from its normal course. Loose material build-up of more than 50 mm high at any point around the bases of signposts greater or equal to 100 mm diameter. MDR Recording: Defects shall be recorded on the MDR as UPW.	30 days	All	Not applicable	Surface All loose material removed and surface shall be free draining. Bases of poles or posts greater or equal to 100 mm dia clear of built-up material. Delineation Pavement marking shall be visible.

BULL DUST HOLES REPAIR (UBH)

Application: This standard applies to the repair of bull dust holes.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Nil. Cyclical Routine Maintenance: Nil. Specific Maintenance: Shoving, depressions, areas of no structural strength/integrity.	Exceeding 4 m ² in total area and of 100mm in depth; Exceeding 1 m ² in total area and of 150mm in depth; or The Defect is considered to be unsafe for road users. MDR Recording: Defects shall be recorded on the MDR as UBH.	n/a	All	Not applicable	Pavement: The repair shall comprise of material that is compatible with, or of better quality than the existing pavement. Surface: The finished level of the final surface shall match the existing surface level.

GRADING OF UNSEALED ROADS (UGR)

Application: This standard applies to the dry and wet grading of unsealed road surfaces.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
<p>Routine Maintenance: Nil.</p> <p>Cyclical Routine Maintenance: Nil.</p> <p>Specific Maintenance: Rutting, depressions, corrugations, areas of poor shape, lack of drainage and areas of poor pavement strength.</p>	<p>Rutting, or depressions greater than 100mm in depth for more than 2 km in length or >50% of the pavement surface is affected;</p> <p>Corrugations exceeding 75mm in height for more than 4 km in length;</p> <p>Travelled way is holding water for more than 100m in length and impacting >25% of the pavement surface; or</p> <p>The Defect is considered to be unsafe for road users.</p> <p>MDR Recording: Defects shall be recorded on the MDR as UGR.</p>	n/a	All	Not applicable	<p>Shape: Reinstate typical crossfall (refer Attachment 4 Unsealed Roads Level of Service) and ensure no ponding of water on the travelled way.</p> <p>Pavement Strength: The pavement repair or reforming or re-sheeting shall comprise material that is of an equivalent or better quality than the existing pavement and is well compacted.</p> <p>Pavement Surface: The finished road surface shall be in a trafficable and safe condition without corrugations, protruding rocky outcrops, rough areas or potholes and free of any loose material.</p> <p>Drainage: Road surface is free-draining.</p>

DELINEATORS (UFD)

Application: This standard applies to the correction of damaged or missing delineators and their mountings.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Missing or incorrectly positioned delineators. Loss of retro-reflectivity identified as part of the asset inspection. Guideposts that are not vertical or are not readily visible in daylight. Delineators damaged by vehicle accidents or vandalism. Cyclical Routine Maintenance: Nil. Specific Maintenance: Nil.	Defects where: <ul style="list-style-type: none"> Any 2 consecutive delineators of the same type are missing or defective or 3 delineators of the same type are missing or defective on any 200m section of road. At culverts, any delineator missing or defective. 50 % of the white painted guidepost is degraded. Any guidepost is leaning more than 10% from vertical. MDR Recording: Defects shall be recorded on the MDR as UFD.	30 Days	Primary Road	Not applicable	Guideposts: <ul style="list-style-type: none"> Shall be spaced at 150 m on straights and in accordance with AS 1742.2 on curves; Shall be vertical; and Shall be white. Retro reflective delineators shall be visible from the 'approach sight distance'. <ul style="list-style-type: none"> On straight sections of road, at least 2 consecutive pairs visible; On the outside of any curve, at least 3 consecutive posts visible. Environmental No proclaimed plants or environmental weeds within 500 mm of delineators.
		30 Days	Secondary Road		
		30 days	Minor Road		
		60 days	Access Road		
		30 Days	Town Streets		

SIGNS (UFR)

Application: This standard applies to the inspection and replacement of deteriorated, damaged or missing signs and supports of Signs. This excludes the mechanical / electrical parts **ONLY** of electronic signs*.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Missing, damaged (physical), or vandalised. Misaligned signs and supports. Signs damaged as a result of vehicle accidents or vandalism. Signs not legible under low beam vehicle lights at the 'safe stopping sight distance' or loss of reflectivity. Cyclical Routine Maintenance: Nil Specific Maintenance: Nil	All Signs other than Regulatory and Warning Signs: Sign support is leaning more than 10% from vertical or if any of the sign legend is illegible from the 'safe stopping sight distance'. Missing or vandalised or damaged signs and supports. The retro reflective luminance of the sign is less than 50% of the luminance prescribed for new retro reflective sheeting. MDR Recording: Defects shall be recorded on the MDR as UFR.	30 Days	Primary Road	Regulatory and Warning Signs: Sign support is leaning more than 20% from vertical or if any of the sign legend is illegible from 'the safe stopping sight'. Missing or damaged and supports. The retro reflective luminance of the sign is less than 50% of the luminance prescribed for new retro reflective sheeting.	Appearance All signs supports shall be vertical. The upper edge of rectangular /square sign shall be horizontal. Signs shall be clean. Location Signs shall be offset from the edge line, kerb or edge of seal in accordance with Part RD-LM-C4 "Sign Installation". Legibility Signs shall be clearly legible from the stopping sight distance as specified in the AS 1742.2 Table 2.3 (day and night). Environmental All vegetation shall be 500 mm clear of sign and support.
		30 Days	Secondary Road		
		30 Days	Minor Road		
		60 Days	Access Road		
		30 Days	Town Streets		

*Refer Part M12 "Maintenance – Electrical and Mechanical – General"

GRAFFITI REMOVAL (UMG)

Application: This standard applies to the removal of graffiti including scoring, posters and stickers.

Activity Type	Intervention Level	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Unwanted defacing by drawing, writing, painting, scoring or placement of posters, or stickers on assets, including but not limited to roadside furniture, the road surface, bridge handrails, delineators or bridges and their abutments. Cyclical Routine Maintenance: Nil. Specific Maintenance: Nil.	Defect: Unwanted defacing of assets. MDR Recording: Defects shall be recorded on the MDR as UMG.	30 Days	Primary Road	Not applicable	Appearance: Free of any drawing, writing, painting, scoring posters, stickers and graffiti. Surface: The surface is not damaged by the cleaning. Colour Matching: To be agreed by the Superintendent prior to work commencing.
		30 Days	Secondary Road		
		30 Days	Minor Road		
		60 Days	Access Road		
		30 Days	Town Streets		

ATTACHMENT 2

PAVEMENT AND FENCING TYPES

PAVEMENT DETAIL**PAVEMENT– SPRAY SEAL TREATMENTS**

TYPE	DESCRIPTION	LAYER	NOMINAL COMPACTED THICKNESS	MATERIAL	APPLICATION RATES* AND ADDITIONAL DETAILS
Bituminous Seal Type 1	10/5mm Double Spray Seal	Bottom	NA	Binder: CRS170/67 Aggregate: SA 10-7mm	0.9L/m ² residual bitumen Spread Rate: 1m ³ /120m ²
		Top	NA	Binder: CRS170/67 Aggregate: SA 5-2mm	0.8L/m ² residual bitumen Spread Rate: 1m ³ /190m ²
Bituminous Seal Type 2	14/7mm Double Spray Seal	Bottom	NA	Binder: CRS170/67 Aggregate: SA 14-7mm	1.0L/m ² residual bitumen Spread Rate: 1m ³ /190m ²
		Top	NA	Binder: CRS170/67 Aggregate: SA 5-2mm	0.8L/m ² residual bitumen Spread Rate: 1m ³ /120m ²
Bituminous Seal Type 3	7mm Single Spray Seal	Top	NA	Binder: CRS170/67 Aggregate: SA 7-5mm	0.8L/m ² residual bitumen Spread Rate: 1m ³ /180m ²

* Application rates are indicative only; design of actual rates used are the responsibility of the Contractor.

PAVEMENT– GRANULAR TREATMENTS

TYPE	DESCRIPTION	LAYER	NOMINAL COMPACTED THICKNESS	MATERIAL	APPLICATION RATES AND ADDITIONAL DETAILS
Pavement Treatment Type 1	150mm cement stabilised existing granular pavement	Base Course	150mm	Existing material stabilised with GB cement	1% Cement, 96% Relative Modified Compaction (RMC)
Pavement Treatment Type 2	150mm cement stabilised existing granular pavement	Base Course	150mm	Existing material stabilised with GB cement	2% Cement, 96% RMC
Pavement Treatment Type 3	150mm lime stabilised existing granular pavement	Base Course	150mm	Existing material stabilised with lime	2% Hydrated lime complying with AS 1672 "Building Limes". 96% RMC

PAVEMENT– SHOULDER TREATMENTS

Materials required for shoulder construction shall be PM 2/20QG and PM 3/20QG.

TREATMENT CATEGORY	TREATMENT TYPE	LAYER CONFIGURATION
Shoulder Box Out	One layer of 150mm depth (PM2/20 or Equivalent)	Layer F
	Two layers of 150mm depth (PM2/20 or Equivalent)	Layer F Layer F
	Three layers of 150mm depth (PM2/20 or Equivalent)	Layer F Layer F Layer F
Shoulder Top and Tyne	Top and Tyne up to 100mm depth	Layer G

LAYER DETAILS

CONFIGURATION	NOMINAL COMPACTED THICKNESS	MATERIAL	APPLICATION RATES & ADDITIONAL DETAILS
Layer F	150 mm	PM2/20	98% MDD
Layer G		PM3/20	96% MDD

Shoulder crossfalls shall be as follows:

LOCATION	CROSSFALL	TOLERANCE
Straights	4 % or same as crossfall of adjacent pavement	+ 1%, - 1%
Outside of Curve	Same as crossfall of adjacent pavement	+ 2%, - 0%
Inside of Curve	Same as crossfall of adjacent pavement	+ 0%, - 2%

FENCING TYPES - SUPPLY & INSTALLATION**1. Median or Roadside Fence**

Mesh wire	6/70/30
Number of plain wires	2
Spacing of posts	16 m
Number of star droppers between posts	3
Type of star droppers between posts	galvanised or black

2. Vermin Fence

Galvanised Netting	900 mm high, mesh size 40 mm, wire diameter 1.4 mm
Number of plain wires	2
Spacing of posts	16 m
Number of star droppers between posts	3
Type of star droppers between posts	galvanised or black

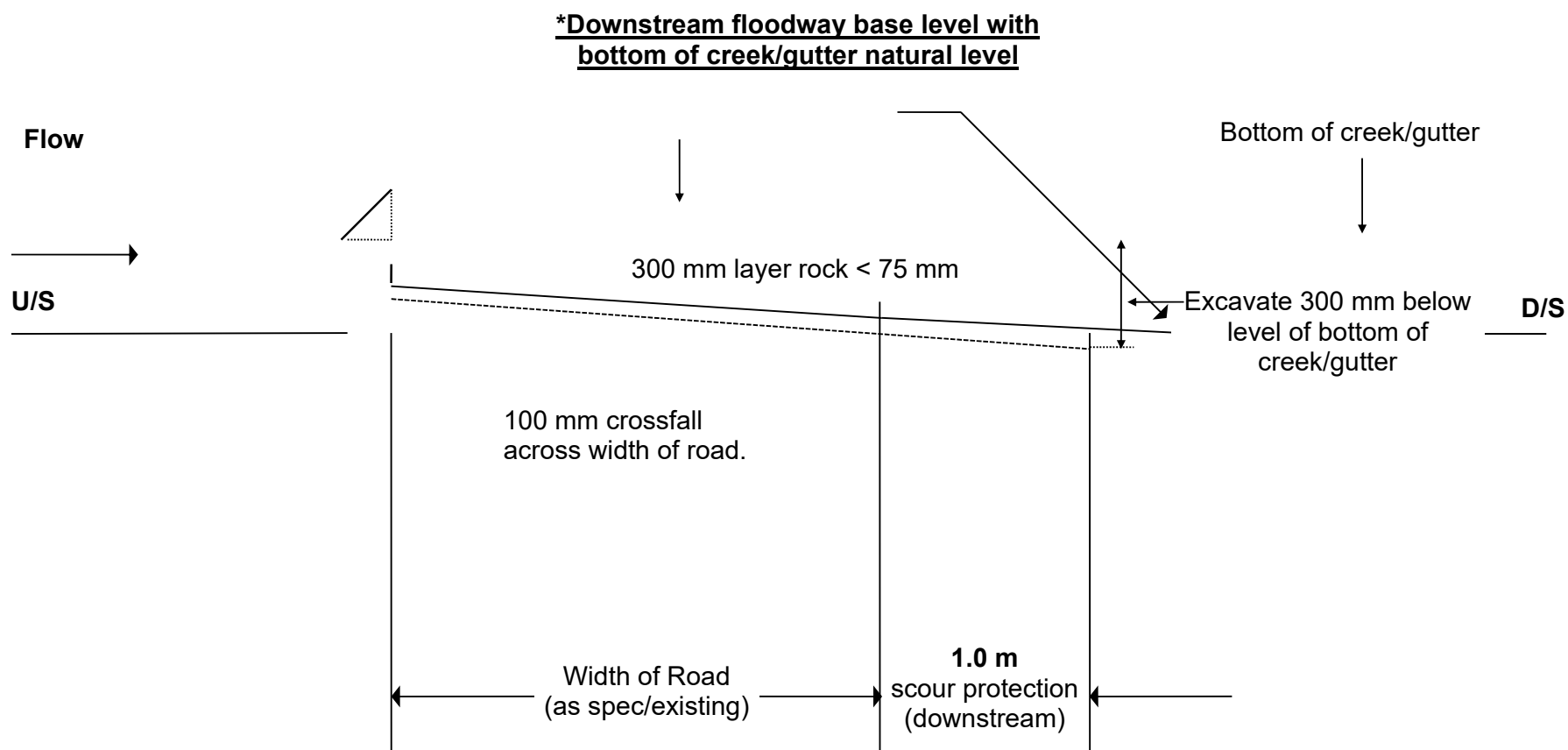
3. Chain Link Fencing

Chain link netting	galvanised
Colour of posts	galvanised
Height of fence	900 mm

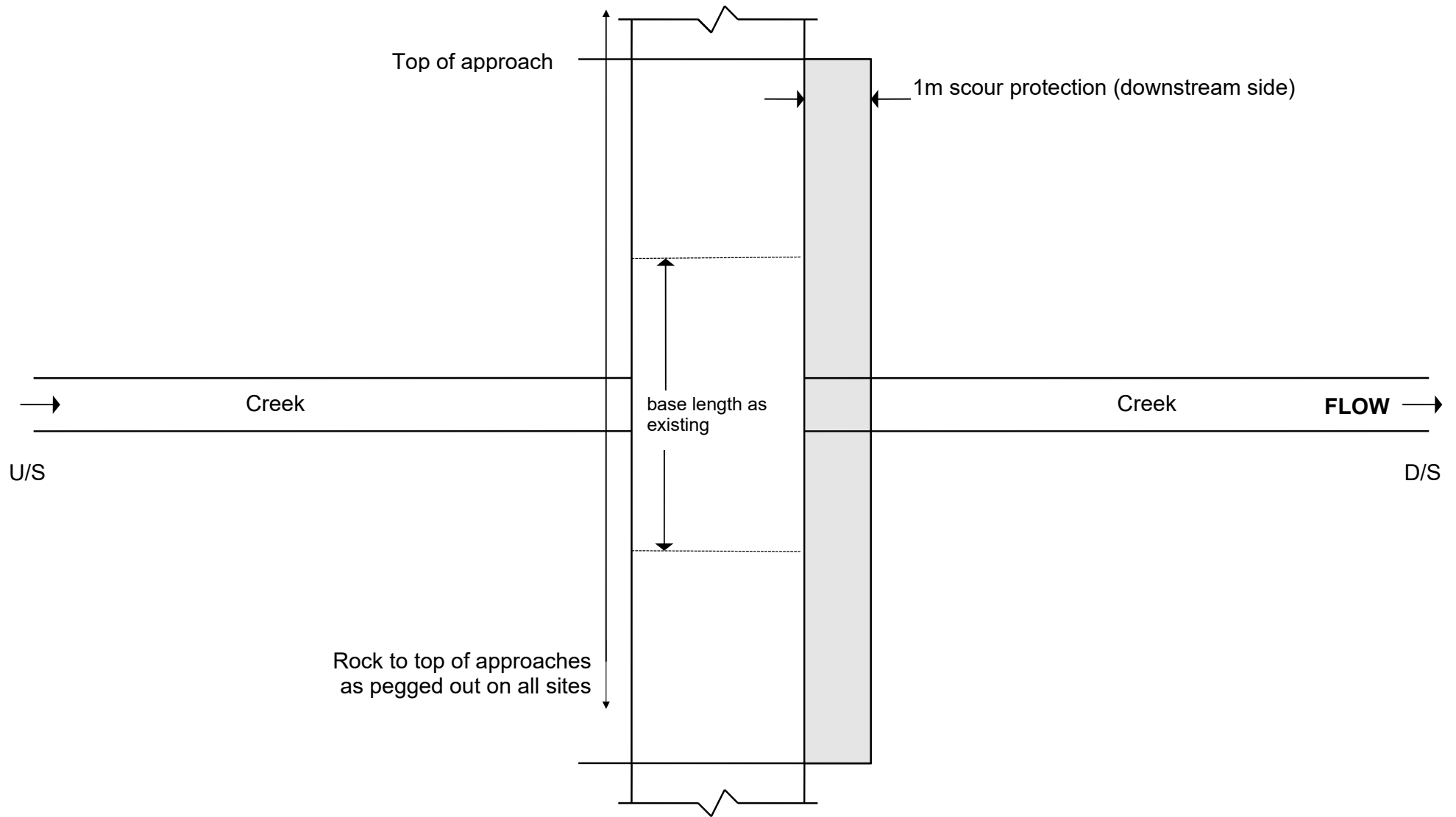
4. Pedestrian Safety Fence

Colour	G25 Olive Green as defined by AS 2700
	G61 Heritage Green as defined by AS 2700

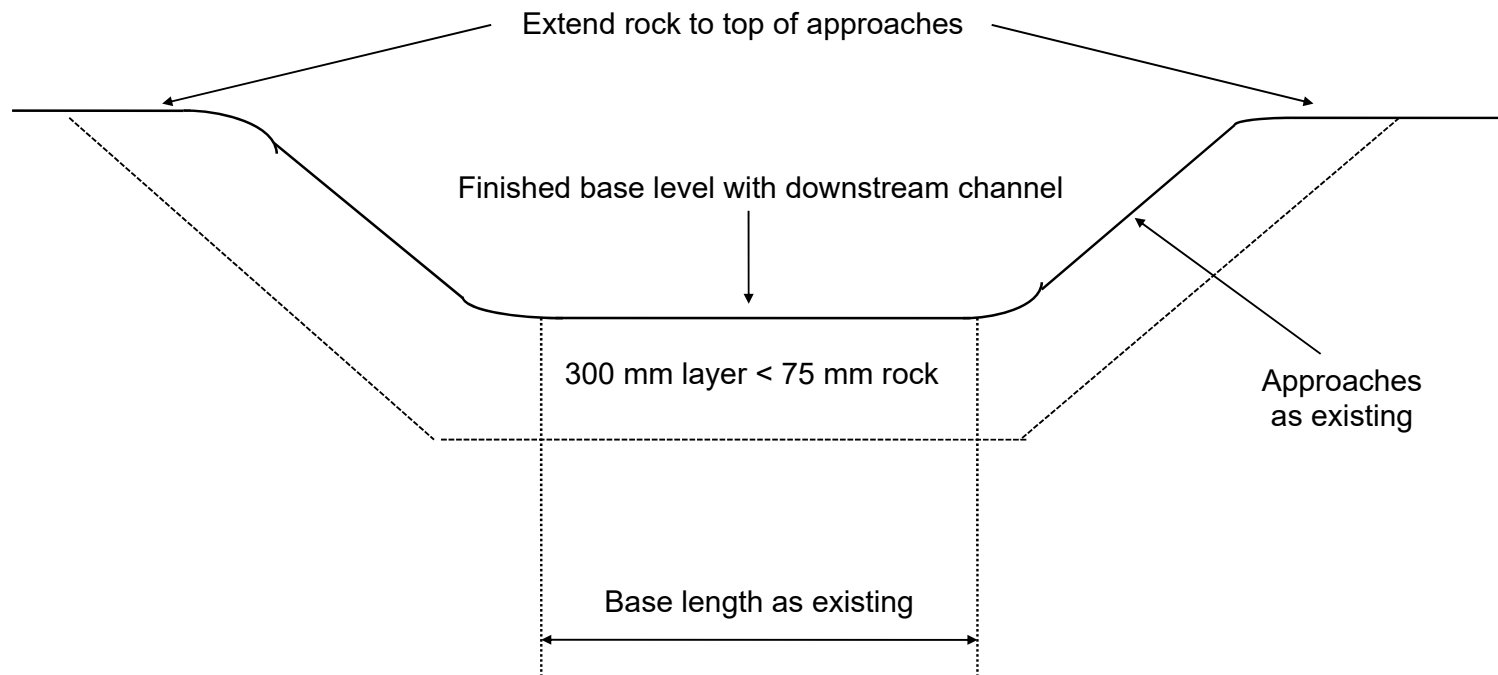
ATTACHMENT 3
FLOODWAY DESIGN

FLOODWAY DESIGN – ELEVATION VIEW (not to scale)

FLOODWAY DESIGN - PLAN VIEW – (not to scale)



FLOODWAY DESIGN - SIDE VIEW – (not to scale)



ATTACHMENT 4

UNSEALED ROADS LEVEL OF SERVICE

UNSEALED ROADS: ROAD CLASSIFICATION AND LEVELS OF SERVICE

Table 1 - Road Classification and Level of Service

ROAD CLASSIFICATION	PRIMARY	SECONDARY	MINOR	ACCESS
ARRB “Unsealed Roads Manual: Guidelines to Good Practice” (2009) equivalent classification	4A	4B	4C	4D
Road function description	<ul style="list-style-type: none"> • Primary access to Regional Centres • Primary access to major industrial / multiple mining areas • Major Freight Route • Major Interstate Tourist / Commuter route 	<ul style="list-style-type: none"> • Primary access to communities • Secondary access to Regional Centres • Moderate Freight Route or access to industrial / mining areas • Major State or minor Interstate Tourist route • Access to essential services e.g. airstrips 	<ul style="list-style-type: none"> • Secondary access to communities • Seasonal / infrequent Freight Route • Minor Tourist route • Property access collector route 	<ul style="list-style-type: none"> • Local access to dwellings, tourist attractions and non-essential services • Restricted Tourist route
Level of Service	<ul style="list-style-type: none"> • Unsealed. Can be capped if funding available. • Priority for treatment after weather closures. • Up to 4 grades per year with targeted wet maintenance. 	<ul style="list-style-type: none"> • Two-lane road formed with targeted sheeting • Second priority for repair after wet weather closures • Up to 3 grades per year 	<ul style="list-style-type: none"> • Dry weather road only, formed using natural local materials • May be compacted road base in boggy and/or rough areas • May be restricted to four-wheel-drive vehicles • May be closed for extended periods of time due to flood damage • Up to 2 grades per year 	<ul style="list-style-type: none"> • Predominantly a single-lane two-way earth track (unformed) at or near the natural surface level • Predominantly not conforming to any geometric design standards • May be restricted to four-wheel-drive vehicles • Likely to be closed for extended periods of time due to flood damage • Up to 1 grade maximum per year if required and funding is available only
AADT	> 100	100–50	50–10	< 10
Max. operating speed (km/h)	50-80	30-70	40-60	under 40
Pavement	Fully sheeted	Target sheeting	Formed earth	Graded
Formation width m	11	9	6	3
Carriageway width m	9	7	-	-

ROAD CLASSIFICATION	PRIMARY	SECONDARY	MINOR	ACCESS
Lanes no. x width m	2 x3.5	2 x 3	2 x 3	1 x 3
Shoulder width m	1	0.5	-	-
Crossfall	5%	5%	5%	-
Grids	Double Width	Single Width	Single Width	-
Signage	Signage and delineation as per OI 2.37	Full signage, delineation on curves	Warning signage only, delineation on curves	Hazard warning
Rest areas / Truck stops	80-120 km apart	Not provided	Not provided	Not provided
Curve radius m	320	250	170	-
Crest K value	50	30	19	-
Sag K value	11	8	6	-
Stopping SD m	150	120	90	-
Intermediate SD m	290	230	180	-

ROAD CLASSIFICATION CROSS SECTIONS

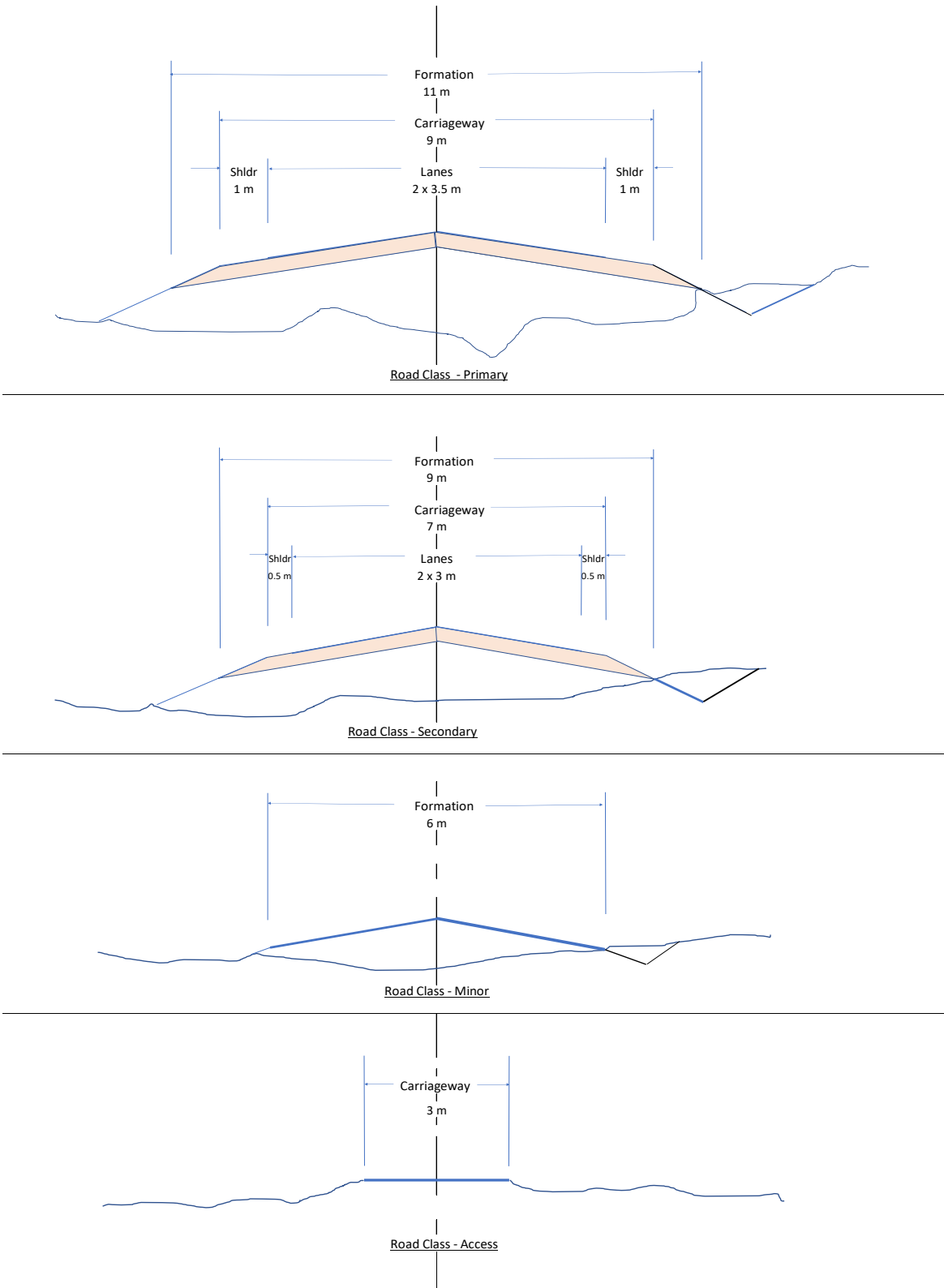
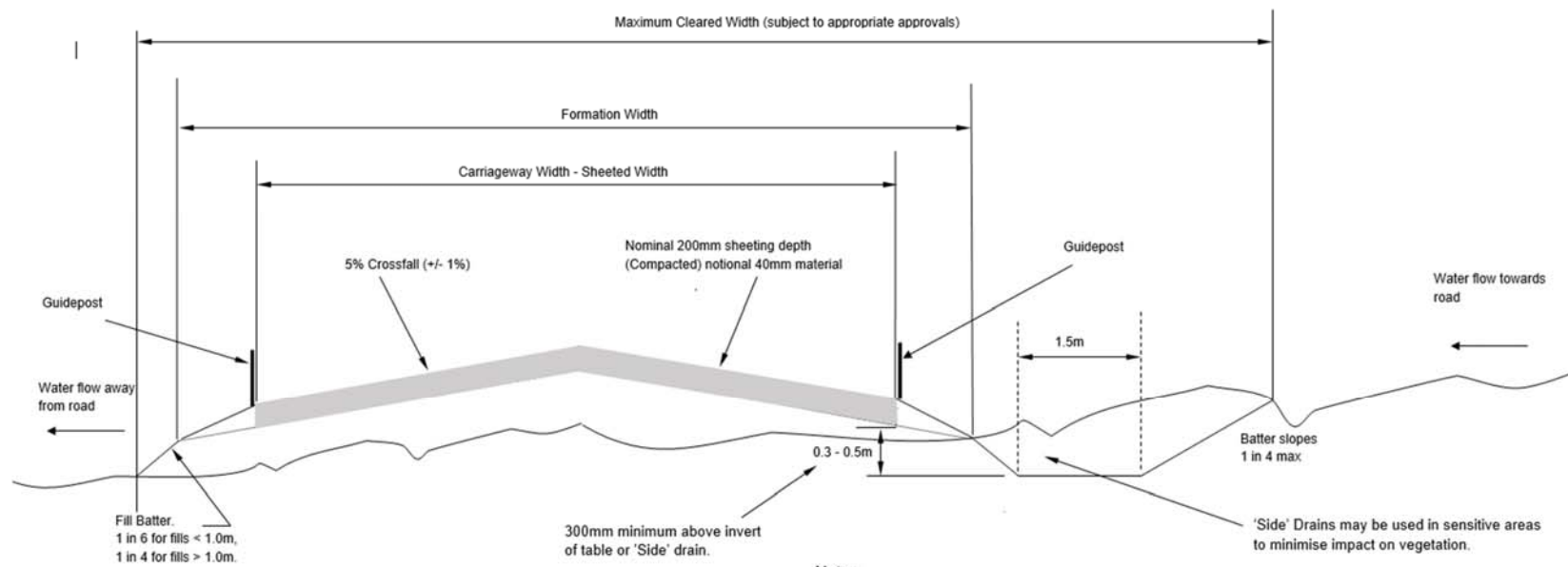


Figure 1 – Road Classification Cross Sections

UNSEALED ROADS TYPICAL CROSS-SECTIONS FOR PRIMARY AND SECONDARY ROADS

Figure 2 – Unsealed Roads Typical Cross-Sections For Primary And Secondary Roads

OUTBACK ROADS TYPICAL CROSS-SECTION



Notes:

- Water collected in table drain must be shed into turnouts, floodways or culverts at intervals frequent enough to prevent scouring in the drain.
- Depth of table drains may be increased to 'win' sufficient formation material.
- Windrows must NOT be left by graders, blocking water flow from the surface.
- Final sheeting depth dependant on subgrade strength.
- No plant shall operate outside of the Maximum Cleared Width without prior approval from the Superintendent

ATTACHMENT 5
TURKEY NEST PLANS

Sketch no. TURKEY 01
Sketch no. TURKEY 02



Turkey Nest Plan
Sketch Sheets 1 & 2.P