

### **PREAMBLE**

This Road Maintenance Specifications is one of a series of Engineering Specifications, Standards, Manuals and Guidelines issued by Ministry of Works and Transport. It gives guidance and recommendations to the Engineers responsible for the maintenance of roads in Uganda. It complements the Ministry's efforts in providing guidance to the construction industry by setting uniform standards to be used in the construction and maintenance of infrastructure facilities that meet the needs of the users.

The purpose of this Specification is to serve as nationally recognized document, the application of which is deemed to serve as a standard reference and ready source of good practice for the preparation and implementation of road maintenance works.

Further, this Specification is a technical document, which, by its very nature, requires periodic updating from time to time arising from the dynamic technological developments and changes. The Ministry, therefore, welcomes proposals on areas for further development and revision stemming from the actual field experience and practice. It is hoped that the comments will contribute to future revisions of the Manual expected to lead to better and more economical designs.

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## 1 INTRODUCTION

Uganda is a country with varying topography as well as soil and climatic conditions. This causes varying requirements to the maintenance of roads for instance in work methods, intervention frequencies and costs. Roads may run for instance in mountainous areas and terrain, where severe conditions prevail, or in lowland areas and very flat terrain with tropical conditions. Thus modifications may have to be made to these Road Maintenance Specifications according to the specific topographic, soil and climatic conditions as well as material availability by relevant staff members of the Uganda Road Administrations. Experiences must always be taken into account and practices changed, if sensible.

Uganda is a typical developing economy; a large programme of rehabilitating and reconstructing roads is underway. In order to safeguard large investments that are being made, the rehabilitated and reconstructed roads should be taken under regular routine and periodic maintenance immediately upon works completion, using suitable and optimal work methods. Timely routine maintenance saves money!

These Road Maintenance Specifications include a selection of most important routine maintenance activities and some periodic maintenance measures. Technical Specifications are divided in to three parts: 1.) Technical specifications for Labour-based contracts, 2.) Manual Maintenance, 3.) Mechanical Maintenance. Manual Maintenance and Mechanical Maintenance Specifications can be used for maintenance contracts and force account tasks. Specifications for Borrow pits, Quarries and environmental requirements are also included in this manual. Road Maintenance Work Performance Specifications are included as well.

It should be kept in mind that these instructions are suitable for engineered roads that are in maintainable condition. When performing activities on non-engineered roads or on heavily deteriorated roads, the work methods have to be adjusted according to the specific needs, circumstances and funding possibilities.

Routine maintenance activities are conducted on the roads usually on annual basis, sometimes several times a year and even weekly, if conditions so require. Routine maintenance activities may be divided into cyclic and reactive work types. Cyclic works like vegetation control and drainage cleaning are dependent on environmental effects rather than traffic amounts and composition. Reactive works like pothole patching and edge repair are carried out as response to the combination of traffic and environmental effects. Periodic maintenance activities are carried out periodically, with intervals of several years. Typical periodic maintenance works include overlay works on paved roads and regravelling on unpaved roads.

All countermeasures must be implemented in a good, safe and environmentally accepted manner without damaging the road formation pavement or structures or adjacent public or private property in any way and to all satisfaction of the Employer.

The purpose of maintenance is to provide continuous acceptable condition to allow for uninterrupted, safe and economic travel and transport on the roads. Properly planned and timely maintenance interventions ensure the least long-term costs for the road agency, because by avoiding premature deterioration high rehabilitation costs will be saved.

### 1.1 Road Condition Rating and Inspections

#### Road Condition Rating

These Specifications and the Road Maintenance Management Manual include a condition rating system for most common road conditions. Intervention levels refer to the rating system and if no condition rating exists, the intervention level is described in another way. Actual observations of conditions are discussed in average figures based on ratings for 1 to 2 km long road sections as ordered by the top management. Rating for the entire contract road can be calculated by summing up all observed sections. The overall condition of a road or section of the road is determined by the variable of the lowest rating value.

### Independent Road Inspector (RI)

Condition survey is based on visual inspection. Inspection system is explained more in detail in the Road Maintenance Management Manual of 2004. In the system RI is authorised to give notices and other sanctions to the contractors or force account crews, if the conditions of roads do not meet the requirements. RI would authorise the payments to the contractor for satisfactory work. If requirements are not met on a continuous basis RI may demand the contractor or the person in-charge be changed. Inspection intervals are according to the maintenance priority class. Defects observed during the previous inspection must be corrected by the next inspection. Inspection log-book must be filled-in each time and signed by the RI and the Contractor or a corresponding person who also will receive a copy of it. If the conditions are satisfactory, the form will be used as a Payment Permission Document (PPD) for the site management of the Client (no objection to payment). The person responsible for payments must receive one copy of PPD.

### Reporting

Quality reports shall be created after each inspection. The Basic Quality Report shall include all gathered data by basic sections with summaries by road and by maintenance priority class. It shall also include notes given to the Contractor for correcting the observed defects and remarks about corrections. The Summary Report shall be prepared each month by contract area. It shall include average condition rating by road and by maintenance priority class. The report shall be distributed to the site managers and the maintenance manager of the region. PPD letters for payments for the sections that have been properly maintained shall be delivered monthly to the person in-charge.

For labour-based and routine manual maintenance contracts the monitoring and reporting should include level of implementation of measures as prescribed in simplified checklists for such works. The Ministry of Local Government has already developed simplified environmental checklists which could be applied for labour – based road works at community level.

## 1.2 Traffic Safety Considerations

In all cases the contractor must put in place abatement measures against accidents including measures for alerting motorists about the culvert replacement exercise. The contractor is therefore required to delineate the work area using temporary traffic signs and traffic speed control signs/devices, which may include placement of triangles on either side of the culvert replacement works. Such temporary traffic signs shall then be removed once the culvert replacement works have been finalised. These safety measures should also apply to Specification on premix pothole patching as well as to Specification on repair of edge failures.

## 1.3 Environmental Considerations

The requirements associated with Quarries and Borrow Pits and the protection of the Environment are included in to this manual.

In most cases environmental considerations are also included in the performance specifications for that work item.

The contractor may be obtaining the materials for the works from some off-site areas involving excavation of materials such as gravel or preparation of materials such as hot pre-mix of aggregate for spot resealing. It should be noted that some road works such as heavy grading of gravel roads inevitably involves massive off-site extraction of construction materials whose impact may even be more than the actual construction site impacts. The contractor must be required to remedy the damage done in such off-site locations in the process of extracting construction materials.

## 2 TECHNICAL SPECIFICATIONS

### 2.1 Specifications for Labour Based Road Maintenance Works

#### General

The following text includes Road Maintenance Specifications for Labour-Based Maintenance tasks. The revised text is based on Annex 2, "Specifications" of Works Contract Agreement by the Ministry of Works and Transport.

#### L 1 Inspection and Removal of Obstructions

##### Scope and Method of Work

This work shall include inspection of the road, identifying and removal of all obstructions so that the road remains clean at all times. If obstruction is a dead animal, it shall be buried off the road reserve and to a depth of at least 1 metre.

##### Measurement and Payment

The unit of measurement shall be the lump sum, of the inspection and removal of obstructions measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

#### L 2 Cleaning of Side Drains

##### Scope and Method of Work

This work shall include clearing of the side drains off all vegetation, silt and debris to keep them clean and draining at all times. The material removed shall be disposed at least 10 m distant from the centreline of the road or as directed by the Engineer.

##### Measurement and Payment

The unit of measurement shall be the square metre, of the cleaning of side drains measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

#### L 3 Reinstatement/Repair of Scour Checks

##### Scope and Method of Work

This work shall include reinstatement/repairing of scour checks made of stones or wooden piles firmly fixed in the ditch to the following spacing:

Gradient- %	Spacing interval m
Less than 4 %	Not required
4 – 5 %	20 m
5 – 8 %	10 m
8 – 10 %	5 m

##### Measurement and Payment

The unit of measurement shall be the number, of the repair of scour checks measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

**L 4 Repair of Eroded Ditches**

The tendered rate shall include full compensation for the execution of all the Works as specified.

**Scope and Method of Work**

This work shall include repairing of eroded ditches including side drains with suitable material and compact.

**Measurement and Payment**

The unit of measurement shall be the linear metre, of the repaired eroded ditches measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

**L 5 Cleaning of Mitre/Catch Water Drains****Scope and Method of Work**

This work shall include clearing of mitre/catch water drains so that they are clean and draining all the time. The material removed shall be disposed of at least 5 m distant from the drains and not less than 10 m distant from the road centreline.

**Measurement and Payment**

The unit of measurement shall be the linear metre, of the cleaning of mitre/catch water drains measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

**L 6 Cleaning of culvert****Scope and Method of Work**

This work shall include cleaning of all silted culverts including inlets, outlets and outflow channels to a minimum length of 20 m.

**Measurement and Payment**

The unit of measurement shall be the linear metre, of the cleaned culvert measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

**L 7 Cleaning of Stream Channels****Scope and Method of Work**

This work shall include cleaning of stream channels free of debris and vegetation to ensure the flow of water through bridges and culverts at all times up to 10 m distance both upstream and downstream.

**Measurement and Payment**

The unit of measurement shall be the linear metre, of the cleaned stream channel measured

in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

#### **L 8 Filling of Potholes, Minor Gullies**

##### Scope and Method of Work

This work shall include filling up potholes and minor gullies on carriageway with approved material up to level of adjacent road surface.

##### Measurement and Payment

The unit of measurement shall be the square metre, of the filled potholes and minor gullies measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

#### **L 9 Grubbing to Reinstate Road Camber**

##### Scope and Method of Work

This work shall include reinstatement of the carriageway by grubbing, filling and compacting gullies and potholes using approved material and reinstate to specified camber as directed by the Engineer.

##### Measurement and Payment

The unit of measurement shall be the square metre, of the reinstated carriageway measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

#### **L 10 Repair of Shoulder Slope Erosion**

##### Scope and Method of Work

This work shall include reinstatement of eroded shoulder and ditch slopes by grubbing and using approved material to the original camber and level.

##### Measurement and Payment

The unit of measurement shall be the square metre, of the reinstated eroded slope measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

#### **L 11 Grass Cutting**

##### Scope and Method of Work

This work shall include keeping of all grass cut to a specific level of not more than 75 mm high, and to a width of at least 3 m distant from the side drain and on shoulders and dispose off all debris not less than 5 m distant from side drains.

### Measurement and Payment

The unit of measurement shall be the square metre, of the grass cutting measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 12 Weeding of Shoulders**

#### Scope and Method of Work

This work shall include weeding of all grass from the shoulders and dispose to spoil not less than 10 m distant from the side drain.

#### Measurement and Payment

The unit of measurement shall be the square metre, of the weeded shoulder measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 13 Bush/Shrub Clearing**

#### Scope and Method of Work

This work shall include clearing of the road reserve of all bush/shrub to a level not exceeding 150 mm to ensure sight distance visibility to road users.

#### Measurement and Payment

The unit of measurement shall be the square metre, of the bush/shrub clearing measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 14 Tree Planting**

#### Scope and Method of Work

This work shall include planting of tree seedlings provided by the District Engineer along road side at 20 m intervals and 3 m distant from the side drain.

#### Measurement and Payment

The unit of measurement shall be the number, of the planted tree measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

### **L 15 Tree Nursing**

The tendered rate shall include full compensation for the execution of all the Works as specified.

#### Scope and Method of Work

This work shall include attending to all trees planted for such a time that they can resist dry weather conditions and insect attack.

### Measurement and Payment

The unit of measurement shall be the square metre, of the area of nursed trees measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 16 Removal of Debris and Silt on Carriageway**

#### Scope and Method of Work

This work shall include removal of all debris and silt so that the carriageway remains free of any debris and silt.

#### Measurement and Payment

The unit of measurement shall be the square metre, of the removal of debris and silt on carriageway measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 17 Sweeping of Carriageway**

#### Scope and Method of Work

This work shall include sweeping of the carriageway using broom so that the road remains clean and clear. The material removed shall be disposed of at least 5 m distant from the drains and not less than 10 m distant from the road centreline.

#### Measurement and Payment

The unit of measurement shall be the square metre, of the swept carriageway measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 18 Footpath Maintenance**

#### Scope and Method of Work

This work shall include maintenance of footpaths by weeding grass at least 1 m wide and dispose to spoil not less than 5 m distant from the side of the footpath.

#### Measurement and Payment

The unit of measurement shall be the square metre, of the wept grass on footpath measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 19 Miscellaneous**

#### Scope and Method of Work

These are incidental and specific activities that may be directed by the Engineer and include;

felling and removal of big trees within the road reserve, removal of anthills and shall be carried out to the satisfaction of the Engineer.

### **Measurement and Payment**

The unit of measurement shall be the lump sum, of the activity directed by the Engineer measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 20 Bridge deck sweeping**

#### **Scope and Method of Work**

This work shall include sweeping of the bridge deck and possible sidewalk using broom so that the road remains clean and clear. The material removed shall be disposed of at least 5 m distant from the drains and not less than 10 m distant from the road centreline.

#### **Measurement and Payment**

The unit of measurement shall be the square metre, of the activity directed by the Engineer measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 21 Expansion joint cleaning**

#### **Scope and Method of Work**

This work shall include cleaning of expansion joints using broom so that the joint remains clean and clear. The material removed shall be disposed of at least 5 m distant from the drains and not less than 10 m distant from the road centreline.

#### **Measurement and Payment**

The unit of measurement shall be the square metre, of the activity directed by the Engineer measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **L 22 Bridge drainage pipe cleaning**

#### **Scope and Method of Work**

This work shall include cleaning of the blocked bridge drainage pipes using brooms and rods so that the pipe remains clean and clear. The material removed shall be disposed of at least 5 m distant from the drains and not less than 10 m distant from the road centreline.

#### **Measurement and Payment**

The unit of measurement shall be the square metre, of the activity directed by the Engineer measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

## 2.2 V-i Standard Specifications

The works shall be carried out according to the MoWT General Specifications for Road and Bridge Works January, 2005.

## 2.3 V-ii Particular Specifications

The Special Provisions to the Standard Specifications shall be regarded as additions, amendments and modifications to the Standard Specifications June, 1990. The Special Provisions shall prevail over the Standard Specifications.

The following text includes Road Maintenance Specifications for both Manual Maintenance and Mechanised Maintenance tasks and in addition, Quarry, Borrow Pit and Environmental requirements. The Manual Maintenance specifications are complete and are presented herein in their entirety. Conversely, the Mechanised Maintenance specifications are intended to complement MoWT's General Specifications for Road and Bridge works and should therefore be read in conjunction with them.

## 2.4 M 100 Manual Maintenance Specifications

### M 101 Weeding of Gravel Carriageways and Shoulders

#### Scope and Method of Work

Where directed by the Employer all grass and other vegetation occurring within the gravel carriageway or gravel shoulder shall be uprooted by pulling up each individual plant or shoot, and all the erasing shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/private property in any way and all to the satisfaction of the Employer.

However, if the aforesaid weeding disturbs the surface of the carriageway or shoulder then the surface shall be watered and re-compacted to the satisfaction of the Employer.

#### Measurement and Payment

The unit of measurement shall be the square metre, of the weeded gravel carriageway or shoulders measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### M 102 Grass Cutting and Bush Clearing

#### Scope and Method of Work

All grass and other vegetation within a width of 10 metres from the road centreline or 1 metre beyond the limits of the side drains or earthworks or structures, whichever is the greater shall be cut such that it is maintained at a height not greater than 150 mm above the in-situ ground level, and all the cutting shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer.

In addition, all vegetation within a width of 3 metres beyond the limits of the side drains or earthworks or structures, whichever is the greater shall be cut such that it is maintained at a height not greater than 500 mm above the in-situ ground level, excepting only throughout the inside of horizontal curves with radii of less than 500 metres in which case the aforesaid vegetation control shall be extended to 10 metres beyond the limits of the side drains or earthworks or structures, whichever is the greater and all the cuttings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer.

### Measurement and Payment

The unit of measurement shall be the square metre, of the grass cutting and bush clearing measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 103 Removal of deposits on the Carriageway and Shoulders**

#### Scope and Method of Work

Notwithstanding the vegetation control specified separately, all extraneous deposits on the carriageway and shoulders and all associated vegetation therein occurring above the original as-built formation level shall be removed without disturbing the remaining formation which shall thereby be reinstated to its' original level and cross fall, and all cleared spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer.

Wherever the resultant surface of the carriageway or shoulder is disturbed then the surface shall be watered and recompact to the satisfaction of the Employer.

#### Measurement and Payment

The unit of measurement shall be the lump sum, of the removal of deposits on the carriageway and shoulders measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 104 Removal of Obstructions from the Carriageway, Shoulders and Drainage**

#### Scope and Method of Work

Notwithstanding the removal of deposits specified separately, all extraneous items which form or threaten to form an obstruction to the free flow of traffic or drainage of water shall be removed without disturbing the remaining formation; and all arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer.

Where such obstructions comprise carcasses of dead animals, each carcass shall be disposed of by burial in a 1 metre deep pit.

#### Measurement and Payment

The unit of measurement shall be the lump sum, of the removal of obstructions from the carriageway, shoulders and drainage measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 105 Culvert Cleaning**

#### Scope and Method of Work

All debris, deposits and vegetation shall be suitably removed from within the culverts and their inlets and outlets such that they remain clean and free flowing at all times, and all cleared

spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/private property in any way and all to the satisfaction of the Employer.

#### Measurement and Payment

The unit of measurement shall be the linear metre, of the cleaning of culvert measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 106 Cleaning, of Streams, Channels and other Water Courses**

#### Scope and Method of Work

All debris and vegetation shall be suitably removed from within the streams, channels and other water courses such that they remain clean and free flowing at all times, and all cleared spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/private property in any way and all to the satisfaction of the Employer.

#### Measurement and Payment

The unit of measurement shall be the linear metre, of the cleaning of streams, channels and other water courses measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 107 Cleaning of Side-Drains**

#### Scope and Method of Work

All debris and vegetation shall be suitably removed from within the side-drains such that the design cross-section and longitudinal profile are retained or where the design of this is not known the side drain shall be maintained at a depth of 0,5 m below the adjacent road shoulder level and to a width of 0,5 m at the invert with side slopes of 1 in 1,5 with a fall to the nearest outlet point, such that the side-drain is maintained clean and free flowing at all times; and all cleared spoils and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer.

#### Measurement and Payment

The unit of measurement shall be the linear metre, of the cleaning of side drains measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 108 Cleaning of Shoots**

#### Scope and Method of Work

All debris and vegetation shall be suitably removed from within the offshoot channels such that they remain clean and free flowing at all times, and all cleared spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without

damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer.

#### Measurement and Payment

The unit of measurement shall be the linear metre, of the cleaning of shoots measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 109 Earthworks Erosion Repair**

#### Scope and Method of Work

All earthworks potholes, ruts, runnels, scour points, washouts or other erosion damage occurring in the carriageway, shoulders, drainage or formation extending to 1 metre beyond the limits of earthworks shall be repaired. The repair to include the removal of loose or deleterious material from within the indentions, the trimming of the indentation back to sound material to render it suitably trimmed and shaped to act as a key to fill material, together with the provision and placing of suitable selected gravel wearing course material and watering and compaction of the fill and subsequent surface trimming to adjacent surface level. The selected fill is to be provided from approved borrow pits, and all cleared spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/private property in any way and all to the satisfaction of the Employer.

#### Measurement and Payment

The unit of measurement shall be the square metre, of the erosion repair measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 110 Headwall, Wingwall and Scour Control Repairs**

#### Scope and Method of Work

All damaged or deteriorated headwalls, wingwalls or scour controls shall be reported to the Employer and shall subsequently be repaired at the direction and to the satisfaction of the Employer, using materials supplied by the Employer, and all spoil or other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/private property in any way and all to the satisfaction of the Employer.

The aforesaid reinstatement shall conform to the original as-built design and standard unless specifically directed otherwise by the Employer, although scour controls shall normally be reinstated at intervals of 5 metres where the drainage gradient exceeds 10%, at 10 metre intervals for gradients of 8-10%, and at 20 metre intervals for gradients of 6-8 %.

#### Measurement and Payment

The unit of measurement shall be the square metre, of the repaired structure measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

**M 111 Painting of Guardrails and Headwalls etc**

## Scope and Method of Work

All guardrails, headwalls or other roadside furniture and structures in need of painting shall be reported and subsequently shall be painted at the direction of and to the satisfaction of the Employer, using materials supplied by the Employer; and all surplus materials, spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer.

## Measurement and Payment

The unit of measurement shall be the square metre, of the painted structure measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

**M 112 Traffic Sign Repair**

## Scope and Method of Work

All traffic signs or guide boards in need of painting, repair or replacement shall be reported and subsequently shall be painted, repaired or replaced at the direction of and to the satisfaction of the Employer, using materials supplied by the Employer; and all surplus materials, spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer. All damaged traffic signs or guide boards shall be returned to the location directed by the Employer.

## Measurement and Payment

The unit of measurement shall be the square metre, of the painted structure measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The unit of measurement shall be the number, of the repaired or replaced structure measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

The tendered rate shall include full compensation for the execution of all the Works as specified.

**M 113 Erosion Control Structure Repair**

## Scope and Method of Work

All check dams or drain linings in need of repair shall be reported and subsequently shall be repaired at the direction of and to the satisfaction of the Employer, using materials supplied by the Employer; and all surplus materials, spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer.

## Measurement and Payment

The unit of measurement shall be the square metre, of the repaired structure measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 114 Bridge Maintenance**

#### Scope and Method of Work

All damages on bridges or adjacent structures in need of repair shall be reported and subsequently shall be repaired at the direction of and to the satisfaction of the Employer, using materials supplied by the Employer; and all surplus materials, spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer. However all steel or wooden structures shall be removed to the location directed by the Employer.

#### Measurement and Payment

The unit of measurement shall be the square metre, of the repaired structure measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

## **2.5 M 200 Mechanised Maintenance Specifications**

### **M 201 Preamble**

These specifications are to be read in conjunction with General Specifications for Road and Bridge works of MoWT's Standard Contract Documents which shall generally apply to these maintenance works, say only where specific maintenance works are specified herein and prove to be in conflict with the General Specifications, in which case the particular maintenance specification shall govern.

The scope of the Works required under each of the specified maintenance activities shall include for provision of all permanent and temporary materials, equipment, tools, consumables, labour and supervision and all other resources necessary for the complete and proper execution of the works, as specified and in accordance with the Contract.

### **M 202 Re-excavation of Side-Drains and of Shoots**

#### Scope of the Works

The works shall include the cleaning and reinstatement of road side drains, ditches and offshoots to restore the drainage to their as-built vertical and longitudinal profiles and cross-section.

#### General Requirements

File works shall be executed in accordance with Sections 1100, 1200, 1300, 1400, 1500, 1800 and 7000 of the General Specifications with the following specifications of particular application.

#### Construction

Re-excavate side-drain, ditch or offshoot to original as-built vertical and longitudinal profiles and cross-section, including trimming of the limits of the excavation to ensure ingress of

surface water; and remove and suitably dispose of all arisings at least 25 metres distant from the road centreline; all without damaging the road formation, pavement or structures or adjacent public property in any way and all to the satisfaction of the Employer.

Any over-excavation shall be made good at the Contractor's expense by benching importing placing and compacting selected material, to at least 93 per cent of the modified AASHTO density, to the satisfaction of the Engineer.

#### Measurement and Payment

Item: Re-excavation of existing side-drain, ditch or offshoot ..... Linear metre (1m) of excavation.

The unit of measurement shall be the linear metre, of the drainage excavation measured in final position after satisfactory completion of the execution of the Works and acceptance by the Engineer.

The tendered rate shall include full compensation for the execution of all the Works as specified.

### **M 203 Culvert Re-placement**

#### Scope of the Works

The Works shall include the excavation, breaking out, removal and disposal of an existing culvert and headwalls, together with the complete new construction of the culvert and headwalls together with the associated reinstatement of the road formation, subbase, roadbase and gravel wearing course or bituminous pavement and shoulders and the clearing and reinstatement of associated side drains.

#### General requirements

The Works shall be executed in accordance with sections 1100, 1200, 1300, 1400, 1500, 1600, 2200, 3200, 3300, 3400, 3500, 3600, 3800, 4100, 4200, 4300, 4400, 4500 and 7000 of General Specifications with the following specifications of particular application.

#### Construction

Culvert replacement shall in general be in accordance with Section 2200 of the General Specifications, covering construction of prefabricated culverts and storm water sewers, excepting that the construction specification caters for excavation through the earthworks only from top of subbase level.

For culvert replacement the Contractor shall excavate through the existing paved road bituminous surface and roadbase or gravel road wearing course, dependant on the type of road involved. The Contractor shall ensure the method of excavation takes care from the outset to isolate the section to be excavated from sound pavement by chiselling through any stabilised base around the limits of the excavation with compressed air road breakers or equivalent approved means and, thereafter, to break-out the material towards the centre of the excavation and to avoid any levering or other disturbance which may extend to the pavement which is to remain in place, and to leave a sound vertical excavated edge.

The width of the excavation shall be in accordance with the minimum width specified under Clause 2206 of the General Specifications, since it relates to the type and size of the culvert to be installed, and minimising the width limits the disruption of the existing pavement and makes for a maximum arching effect over the new culvert during construction and upon completion.

The Contractor shall continue the excavation down either side of the culvert to be replaced, to a depth not greater than the invert of the existing culvert, and the existing culvert shall be first exposed and then removed; the existing headwalls also being broken out to facilitate the

removal of the culvert.

The excavation shall continue to a level corresponding to the bottom of the new bedding layer to be placed in accordance with Clause 2205 of the General specifications: and the new culvert construction shall be executed in accordance with the Section 2200 of the General Specification, excepting only that due allowance shall be made for additional watering of the sides of the excavation and the backfill to counter the drawing effects of the old road formation, and excepting that provision shall be made for the reinstatement of whatever road roadbase and pavement exist, together with the reinstatement of the headwalls.

The reinstatement of any gravel wearing course and shoulders shall be in accordance with Part 3 of General Specifications. The reinstatement of any stabilised roadbase shall be in accordance with the particular specifications in respect of stabilised roadbase repairs. The reinstatement of any bituminous surface treatment shall be in accordance with Part 4 of the General Specifications.

Prior to placing stabilised roadbase materials, any associated shoulder reinstatement required shall be executed in accordance with the shoulder regravelling specifications, excepting only that the reinstated should be left proud of finished level to protect it during the roadbase reinstatement and to allow for the finishing of the shoulder together with the finishing of the roadbase reinstatement, the presence of the shoulder being necessary to constrain the roadbase materials during compaction to ensure full compaction of the roadbase is practicable at the edges.

Immediately prior to and during the placing of stabilised roadbase materials the roadbase shoulder interface shall be trimmed to vertical and the floor and walls of the excavation shall be watered to counter any tendency for moisture to be drawn from the new roadbase materials to the surrounding strata.

All arisings shall be removed and suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation, pavement or structures or adjacent public property in any way and all to the satisfaction of the Employer. Any adjacent bituminous pavement shall be cleaned by use of the mechanical broom or other means approved by the Engineer.

#### Measurement and Payment

Measurement and payment in respect of the new culvert shall be in accordance with Clause 2218 of the General Specifications, with additional payment due to respect of breaking out and reinstatement of road structure above subbase level together with the breaking out and removal of the old culvert being replaced, with the additional payment items as follows.

Item: Extra over for breaking out and reinstatement of Double Bituminous Surface Treatment ..... square metre (m<sup>2</sup>)

Item: Extra over for breaking out and reinstatement of Single Bituminous Surface Treatment ..... square metre (m<sup>2</sup>)

Item: Extra over for breaking out and reinstatement of Stabilised roadbase ..... square metre (m<sup>2</sup>)

Item: Extra over for breaking out and reinstatement of Gravel Wearing Course or Gravel Shoulders ..... cubic metre (m<sup>3</sup>).

Item: Extra over for breaking out and reinstatement of Masonry Headwalls ..... square metre (m<sup>2</sup>)

Item: Extra over for breaking out and removal of existing culvert ..... Linear metre (1 m)

The tendered rates shall include full compensation for the execution of all the Works as

specified.

### **M204 Premix Pothole Patching**

#### Scope of the Works

This work shall include patching of potholes in or on the edge of the paved road surface with a premixed bitumen aggregate mixture.

#### General Requirements

The works shall be executed in accordance with Sections 1100, 1200, 1300, 1400, 1500 and 7000 of the General Specifications.

#### Materials

The bituminous binder accordance of the premix and the aggregates shall be in accordance with Clause 4202 and 4203 of the General Specifications, together with Clause 4213 in respect of the mixture; and the bituminous prime coat and blinding material shall be in accordance with Clause 4102.

#### Equipment

The equipment utilised for the execution of the Works shall be in accordance with Clause 4205 of the General Specifications, excepting only that the compaction of the premix will also be acceptable by pedestrian self-propelled vibrating rollers.

#### Working Restrictions

This is a dry weather activity only, requiring a dry road bed and dry materials; such that working will be restricted to comply with Clauses 4104 and 4206 of the General Specifications.

Excavated potholes represent a severe traffic hazard, particularly at night. As such the excavation of potholes in readiness for patching shall be limited to an amount of patching which can be completed the same day. Any potholes which have been excavated in readiness to receive premix patching but which have not been patched shall be temporarily filled prior to nightfall, using crushed rock or river sand type blinding material as specified above.

#### Method of Working

The Contractor shall delineate the work area using temporary traffic signs in accordance with Clause 1503 of the General Specifications.

Together with the Engineer, the Contractor shall mark-out the limits of each pothole repair required, with oil paint to a rectangular plan area using a straight edge, taking care to extend the limits of the repair to include all hair cracks, deformation or other deterioration associated with the pothole.

The marked out potholes proposed for each day's patching shall be measured jointly by the Contractor and the Engineer. On completion of the measurement the measurement shall be formally agreed by the Contractor and the Engineer, after which the Contractor shall obtain the Engineer's formal approval to excavate those potholes which can reasonably be expected to be patched within the day.

Having obtained the Engineer's prior approval to excavate, the Contractor shall excavate the agreed marked-out potholes. The Contractor shall ensure the method of excavation takes care to breakout the material towards the centre of the pothole and avoids any levering or other disturbance which may extend to the pavement which is to remain in place, to leave a sound vertical excavated edge. The excavation shall continue to a depth at which sound acceptable in-situ material is encountered, but not beyond a depth of 100 mm without the prior approval of the Engineer.

The excavated pothole shall then be cleared of all loose material and then cleaned of dust by air jet or vigorous brushing or other approved means to the satisfaction of the Engineer.

The mean depth of each pothole excavation shall be measured, agreed and recorded jointly by the Contractor and the Engineer, and signed by both parties.

The floor and walls of each pothole excavation shall be slightly dampened with water to stabilise any remaining dust particles and a bituminous prime coat shall then be applied and afforded a period of not less than 30 minutes to allow for penetration, after which time any surplus prime coat material shall be removed; all in general accordance with Clauses 4105 and 4106 of the General Specifications excepting that prime coat may be applied by hand brushing after hand agitation and heating to the approval of the Engineer.

Premixed continuously graded asphalt surfacing material shall be produced and hauled in accordance with Clauses 4202, 4203, 4207 and 1503 'a' and 'b' of the General Specifications.

#### Penetration Grade Bitumen

Binder shall be Penetration Graded bitumen, 80 - 100, in accordance with Specifications. Unless standard mix design exercises in accordance with this Section indicate that the use of these grades is impractical.

#### Grading Requirements of Aggregate for Asphalt Concrete

Sieve Size	Nominal Stone Size Percentage by Mass
37.5 mm	
25 mm	100
19 mm	70 - 85
12.5 mm	60 - 76
9.5 mm	46 - 61
4.75 mm	32 - 48
2 mm	22 - 35
425 µm	10 - 21
75 µm	3 - 8

#### Physical Properties of Premix Asphalt Concrete

Physical Properties	AC2-19 mm
Marshall Stability 75 blows (N)—min.	9,000
Flow Value (mm)	3 - 5
Voids in total mix (%)	4 - 6
Voids in mix at refusal density	Min. 2%
Voids in Mineral Aggregate	13 - 15
Water sensitivity (ASTM 1075)	
Loss of stability on immersion in water	Min. 75% retained strength

It shall be placed and compacted in each primed pothole in layers not exceeding 75 mm compacted thickness, all in accordance with Clause 4210 of the General Specifications, with special attention afforded to ensuring that extra compaction is effected at all the edges of

the pothole and that sufficient material is placed to ensure a domed profile is achieved at final compaction, with a dome height of 12 to 20mm above the adjacent existing pavement reducing to 6 to 10 mm proud at the edge of the pothole; this to allow for the inevitable continued compaction under traffic which would otherwise ultimately result in a depression which would hold water and trigger renewed failure.

Immediately upon completion of compaction, any loose or surplus materials shall be removed and suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation, pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Engineer. The compacted surfacing and any traces of fresh bituminous materials on the surrounding pavement shall be blinded using crushed rock or river sand complying with Clause 4 102 of the General Specifications.

Any potholes which have been excavated in readiness to receive premix patching but which cannot be patched before stopping work for the day shall be temporarily filled prior to nightfall using crushed rock or river sand blinding material complying with Clause 4102 of the General Specifications.

The temporary traffic signs shall then be removed and the Works opened to traffic.

In the event of a surface depression subsequently forming in any of the patched potholes within the contract period the Contractor shall cut back the effected area and place and compact additional premixed asphalt surfacing material to the required domed profile all in accordance with the aforesaid method of working and entirely at his own cost.

#### Testing

The Engineer reserves the right to randomly call on the Contractor to test all the materials and asphalt surfacing mixtures for compliance with the specification, although no in-situ testing will be required of compacted asphalt surfacing, material.

#### Measurement and Payment

Measurement of the Works shall be on a cubic metre basis by directly applying the Jointly agreed pothole area and depth measurements, excepting only that approved variations in bitumen and active filler contents from the nominal mix specified for premixed asphalt surfacing material shall be measured and paid in accordance with Clause 4215 of the General Specification.

### **M205 Repair of Edge Failures**

#### Scope of the Works

This work shall consist of repairing edge failure in accordance with the Specifications and as ordered by the Engineer.

#### Method of Working

The Contractor shall strip the bitumen surface off the carriageway, for a width measured from the edge of the carriageway as shall be directed, and all damaged and unstable parts of the existing base shall be demobilised and excavated until sound stable parts are reached on all sides, but in any case for a depth not less than 0.15m. The shape of the excavation shall then be made rectangular of sufficient dimensions to contain the edge failure.

The cut sides of the finished excavation shall be vertical. The bottom of the excavation shall be compacted to at least 95% of modified AASHTO density.

The excavation shall then be filled with an approved mixture of natural lateritic gravel and road lime, in layers not thicker than 0.15m, after compaction. Each layer shall be properly levelled and watered and carefully rammed or compacted with an approved hand vibratory roller, in

order to achieve a density of at least 98% of Modified AASHTO density.

The mixture of lateritic gravel and road lime shall conform to the requirements of section 3800 of the General Specification. It shall be prepared in advance (pre-mix) with a method approved by the Engineer.

### **Measurement and Payment**

This work shall be measured by the cubic metre, on the basis of the volume excavation filled as ordered by the Engineer.

The rate shall include for all excavation, for disposal of resulting material to dump, at any distance, where ordered, for the compaction of the bottom of the excavation at the specified density, for the supply and placing of the filling of approved mixture of natural lateritic gravel and road lime, at the specified density, for any trail test, for the pre-mix operations and for all charges related to the lime stabilisation as indicated in the General Specification Clause 3806; and for all charges related to the supply of natural gravel, including site clearance of the material sites and access roads, the construction of haul roads, for the removal of top soil and overburden to dump within the material sited areas, for the drainage, protection and reinstatement of the material sites, for excavation and selection of material, for hauling at any distance. The rate shall also include for all labour, equipment, tools plant, supervision, overheads and profit.

### **M206 Spot Resealing**

#### **Scope of the Works**

This work shall include placing of single bituminous surface treatment over small to medium areas of existing paved road surface.

#### **General Requirements**

The Works shall be executed in accordance with Sections 1100, 1200, 1300, 1400, 1500, 1700, 1800, 4300 and 7000 of the General Specifications with the exception of all references to slurry seal and the following particular specifications.

#### **Materials**

Notwithstanding Clause 4302 of the General Specifications, blinding material shall also be provided in accordance with Clause 4102(b).

#### **Preparation of Areas to be Surfaced.**

Notwithstanding Clause 4304 of the General Specifications, following the general preparation of the existing pavement to receive surface treatment the Engineer may instruct the Contractor to surface dress localised spots of excessive stripping by the hand lance application of bituminous binder and hand spread aggregates which shall be compacted by hand rammer or other approved means, all to the satisfaction and approval of the Engineer prior to the application of the full surface treatment.

#### **Demarcation of the Working Area**

Notwithstanding Clause 4304 of the General Specifications, small to medium areas of surface treatment shall be marked out by the conservative use of oil paint of a colour not used for permanent road markings, all to the satisfaction and approval of the Engineer.

#### **Construction of Surface Treatment**

Notwithstanding Clause 4307(a) of the General Specifications, the aggregates shall be evenly spread over the freshly sprayed binder and any aggregate deficiency or areas where the aggregate has been displaced exposing fresh bituminous binder to the roller shall be

immediately remedied by the hand application of additional aggregates.

Notwithstanding Clause 4307(ii) of the General Specifications, any aggregate deficiency which becomes apparent during rolling or areas where the aggregate has been displaced exposing fresh bituminous binder to the roller shall be immediately remedied by the hand application of additional aggregates.

Notwithstanding Clause 4307(v) of the General Specifications, any spillage or evidence of fresh bituminous binder outside the actual immediate area to receive surface treatment shall be blinded as soon as practicable with crushed rock or river sand complying with Clause 4102(b) of the General Specifications to the satisfaction and approval of the Engineer, all at the Contractors cost.

#### Opening to Traffic

Notwithstanding Clause 4310 of the General Specifications, upon opening the surface treatment to traffic, traffic speed controls shall be continuously effected to limit vehicle speeds to a maximum of 40 kilometres per hour over a period of not less than 24 hours or until such time the aggregate has been further bedded in sufficiently to resist stripping, and in addition traffic controls shall prevent vehicles swerving or changing lanes on the fresh surface treatment over this period, all to the satisfaction and approval of the Engineer.

#### Tolerance and Finish Requirements

Clause 4313 of the General Specifications shall not apply to non-construction maintenance works, for which the following specification shall apply.

The edges of the surface treatment shall be true to line with a maximum deviation from the specified line of 50 mm.

The resultant surface treatment shall display a continuous even and densely packed aggregate layer in which all the aggregate chippings are soundly bedded into the bituminous binder.

Any areas which show signs of bleeding after the section has been opened to traffic shall be corrected as specified in Clause 4311 of the General Specifications. Corrective work shall be carried out in such a manner as to blend in colour, texture and finish with adjacent work.

The maximum permissible variation from the rates of application of bituminous binders or aggregates, as ordered by the Engineer, shall be plus or minus 5 % of the rate of application specified.

#### Testing

Clause 4216 of the General Specifications shall apply except for the following amendments: Table 4216/1 shall be amended in respect of the minimum testing frequency of the aggregates such that the grading and the flakiness minimum frequency specified for both is amended to read one test every 250 m<sup>3</sup> or once per day whichever is the more frequent; and for aggregate crushing value (ACV) the minimum testing frequency shall be amended to read one test every 1000 m<sup>3</sup> or once per week whichever is more frequent.

### **M 207 Stabilised Roadbase Repair**

#### Scope of the Works

This work shall consist of the excavation and disposal of failed lime stabilised roadbase material with any associated subbase failure, on paved roads only, followed by the complete reinstatement of the stabilised roadbase and associated subbase, together with the reinstatement of adjacent shoulders and the clearing and reinstatement of associated side drains.

#### General Requirements

The works shall be executed in accordance with Sections 1100, 1200, 1300, 1400, 1500, 1700, 1800, 1600, 3100, 3200, 3300, 3400, 3500, 3600, 3700, 3800, 4100 and 7000 of the General Specifications with the following exceptions presented as specifications of particular application.

#### Equipment

In addition to the equipment specified for construction of gravel roadbase under the General Specifications, equipment shall be provided for associated reinstatement of the side drains and for the cleaning of any adjacent bituminous pavement, the latter requiring the provision of a mechanical broom.

#### Construction

Notwithstanding Clause 3606 of the General Specifications, prior to placing and compaction, the Contractor shall delineate the work area using temporary traffic signs in accordance with Clause 1503 of the General Specifications.

Together with the Engineer, the Contractor shall mark-out the limits of each roadbase repair required, with oil paint to a rectangular plan area using a straight-edge, taking care to extend the limits of the repair to include all hair cracks, deformation of other deterioration as associated with the failure.

The marked out base repairs proposed for each day shall be measured jointly by the Contractor and the Engineer. On completion of the measurement, the measurement shall be formally agreed by the Contractor and the Engineer, after which the Contractor shall obtain the Engineer's formal approval to excavate those areas of base failure which can reasonably be expected to be reinstated within the day.

Having obtained the Engineer's prior approval to excavate, the Contractor shall excavate the agreed Works. The Contractor shall ensure the method of excavation takes care from the outset to isolate the failed section from sound pavement by chiselling through the stabilised base around the limits of the repair with compressed air road breakers or equivalent approved means and, thereafter, to break-out the material towards the centre of the area under repair and to avoid any levering or other disturbance which may extend to the pavement which is to remain in place, to leave a sound vertical excavated edge. The excavation shall continue to a depth at which sound acceptable in-situ material is encountered, but not beyond a depth of 25mm below top of subbase level without the prior approval of the Engineer.

The final levels of excavation shall be jointly agreed by the Contractor and the Engineer and the floor of the excavation shall then be reinstated to top of subbase level by scarification of the floor of the excavation and the placing and compaction of suitable subbase material all in total accordance with Clause 3100, 3200 and 3500 of the General Specifications.

Prior to placing roadbase materials, any associated shoulder reinstatement required shall be executed in accordance with the shoulder regravelling specification, excepting only that the reinstated shoulder shall be left proud of finished level to protect it during the roadbase reinstatement and to allow for the finishing of the shoulder together with the finishing of the roadbase reinstatement. The presence of the shoulder being necessary to constrain the roadbase materials during compaction to ensure full compaction of the roadbase is practicable at the edges.

Immediately prior to and during the placing of the roadbase materials the roadbase shoulder interface shall be trimmed to a vertical and the floor and walls of the excavation shall be watered to counter any tendency for moisture to be drawn from the new roadbase materials to the surrounding materials.

The construction of the roadbase shall then be executed in accordance with Clause 3603 of the General Specifications, excepting only that upon completion the adjacent shoulders

shall be trimmed to final grade and the side drains cleared in accordance with the shoulder regravelling specifications.

All arisings shall be removed and suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation, pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Engineer. Any adjacent bituminous pavement shall be cleaned by use of the mechanical broom or other means approved by the Engineer.

### **M208 Scarification of Existing Pavement and/or Shoulders**

#### Method of Work

This work shall consist of scarifying the existing pavement and/or shoulders to a depth of 0.20 m and over the width ordered by Engineer mixing with a motor grader and homogenising with a pulvimixer or similar approved plate of the scarified material, and its subsequent spreading and compacting, with the addition of water as may be required, in such manner as to obtain a profile in reasonably close conformity with the lines, grades and cross-sections shown on the drawings or staked by the Engineer.

Surplus material shall be disposed of as directed by the Engineer, and any shortage shall be supplied by the addition of other suitable materials having engineering characteristics not inferior to those required for a subbase. The additional material shall be thoroughly mixed by means of a motor grader with the scarified and homogenised material before compacting.

#### Measurement and Payment

The unit of measurement for this work shall be the square metre of pavement and/or shoulder actually scarified in accordance with the instructions of the Engineer.

The work will be paid for at the contract unit price per unit of measurement which price shall be full compensation for all labour, equipment, tools, plant, overheads and profit relevant to the work.

The additional material shall be measured as the difference in volume resulting from measurements taken before and after this work. Payment for additional material will be the cubic metre, including a "free haul" of 10 km from the boundary of any material site. Any additional haul beyond this free haul will be paid for separately.

The unit of overhaul shall be "m<sup>3</sup>/km", defined as the cost of the hauling one cubic metre of material (measured compacted in place on the road) one kilometre. The overhaul length shall be measured to the nearest tenth of a km, along the shortest possible practicable route between the material site and the road works site, from a point on the route 10 km from the boundary of the material site to the centre of volume of the total overhauled material, as dumped on the road.

### **M 209 Limited Reconstruction of existing Pavement**

#### Scope and Method of Work

This work shall consist of the reconstruction of the damaged side(s) of the existing pavement and of the attached shoulder(s), for the widths and lengths directed by the Engineer. The work will include: the removal of all damaged and unsuitable parts of the existing pavement and the whole attached shoulder until sound and stable parts are reached on the bottom of the excavation and cut sides, but in any case for the depth not than 40 cm, having care that cut sites of the finished excavation are vertical; the subgrade preparation of the bottom of the excavation, in accordance with Clause 3400; the refilling of the excavation with borrow materials if necessary, any with a subbase course, minimum thickness 20 cm, on top of which a 20 cm thick lime stabilised base with the attached non stabilised shoulder shall be constructed.

The excavated materials shall be disposed to spoil, unless otherwise directed by the Engineer. The subbase course shall be constructed in accordance with the applicable provision of Section 3500.

The lime stabilised base and the attached non stabilised shoulder shall be constructed in accordance with Clause 3380, except that the width of carriageway to be stabilised can be limited to a minimum of 1,5 m, where directed by the Engineer. Such minimum width of 1,5 m is, in fact, required to permit the use of mechanical equipment, since the reconstruction works, which include also the attached shoulder, will be actually carried out on a minimum width of 2,8 m.

#### Measurement and Payment

The relevant clauses in the General Specifications shall apply.

### **M 210 Shoulder Regravelling**

#### Scope of the Works

Notwithstanding the scope of the gravel shoulder construction specified under Clause 3801 of the General Specifications, the scope of the shoulder regravelling shall also include the reinstatement of existing road shoulders to line level and compaction by the additional selected gravel from approved gravel pits, together with the prior benching and scarification of the benched shoulders and subsequently clearing and reinstatement of associated side drains.

#### General Requirements

The Works shall be executed in accordance with Sections 1100, 1200, 1300, 1400, 1500, 1600, 3100, 3200, 3300, 3600, 3800 and 7000 of the General Specifications with the following exceptions presented as specifications of particular application.

#### Equipment

In addition to the equipment specified for construction of gravel shoulder under the General Specifications, equipment shall be provided for the associated reinstatement of side drains and for cleaning of any adjacent bituminous pavement, the latter requiring the provision of a mechanical broom.

#### Construction

Notwithstanding Clause 3803 of the general Specifications, prior to placing and compaction, the Contractor shall delineate the work area using temporary traffic signs in accordance with Clause 1503 of the General specifications.

Together with the Engineer, the Contractor shall mark-out the limits of the Works required and jointly agree the levels and cross-section of the existing shoulders to be regravelled.

After which the Contractor shall obtain the Engineer's formal approval to commence work on those areas of shoulder regravelling which can reasonably be expected to be reinstated within the day.

The Contractor shall reduce the shoulders to an even, level profile, by grading or other approved means and shall then scarify and water the benched shoulder in readiness for the reconstruction of the shoulder in accordance with Clause 3803 of the General Specifications.

The Contractor shall ensure the method of working takes care from the outset to avoid damaging the adjacent permanent works which, if damaged, shall be reinstated to the satisfaction of the Engineer all at the Contractor's cost.

Upon completion of compaction the adjacent side drains shall be reinstated and cleared of all construction debris, and shoulder shall be trimmed to final grade and profile.

All arisings shall be removed and suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation, pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Engineer. Any adjacent bituminous pavement shall be cleaned by use of the mechanical broom or other means approved by the Engineer.

### **M 211 Heavy Grading of Gravel roads**

#### Scope of the Works

Heavy grading is the reshaping and recompaction of the existing gravel road surface across the full width of the carriageway and shoulders, after recovering suitable displaced material from the side drains and shoulder, which is scarified and watered prior to shaping and compaction to the original cross falls and longitudinal profile, together with the full reinstatement of the side drains.

Where the heavy grading is specified to incorporate a reballasting element, then the provision of the additional materials and resources associated purely with its provision shall be measured and reimbursed separately on a daywork basis.

#### General Requirements

The Works shall be executed in accordance with Sections 1100, 1200, 1300, 1400, 1500, 1700, 1800, 3100, 3200, 3700, 3800 and 7000 of the General Specifications with the following exceptions presented as specifications of particular application.

#### Materials

The gravel shoulders and gravel wearing course material involved shall be the existing in-situ materials complying with Clause 3702 of the General Specifications, and additional material specified for reballasting shall comply with the said clause, excepting only that the Plasticity Index of any additional materials shall be not less than 10 per cent and not more than 25 per cent.

#### Construction

The side drains shall be fully reinstated to the design cross-section and longitudinal profile, with all suitably arisings deposited onto the road formation, from which the vegetation and deleterious material shall be removed and suitably disposed of. All arisings shall be removed and suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation, pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Engineer.

The full width of the shoulders and carriageway shall be scarified to a depth of not less than 75 mm and the resulting material shall be mechanically mixed with the suitable materials from the side drain reinstatement together with any additional reballasting material supplied as specified; and the original cross-sectional and longitudinal profiles shall then be roughly reinstated over the full width of shoulders and carriageway.

The loose gravel shoulder and wearing course material shall be brought to the optimum moisture content by watering and shall be processed and compacted in accordance with provision of Section 3707 of the General Specifications, to a density not less than 95 per cent of the modified AASHTO density in accordance with Clause 3703 of the General Specifications, and to the original final cross-section and longitudinal profile to the construction tolerances specified under Clause 3705 of the General Specifications, excepting only that the finished surface tolerance shall be plus or minus 12 mm of the correct level and shall not at any point be so formed as not to shed surface water.

#### Measurement and Payment

Clause 3708 of General Specifications is not applicable and shall be disregarded and replaced

by the following for Heavy Grading works.

Item 37.04A, Heavy Grading of Gravel Roads.....square metre (m2)

The unit of measurement shall be the square metre of the shoulders of gravel carriageway, measured in final position after satisfactory completion of the execution of the works and acceptance by the Engineer, and the quantity calculated from the authorised dimensions of the layer as shown on the Drawing or as directed by the Engineer.

The tendered rate shall include full compensation for the execution of all heavy grading works as specified

Item 38.02B, Reballasting ..... Dayworks

Measurement of the provision of reballasting material from borrow pits shall be on a daywork basis in respect of the actual pieces of equipment and labour directly employed on the task with the approval of the Engineer.

### **M 212 Medium Grading of Gravel Roads**

#### Scope of the Works

Medium grading is the pure blading by motor grader of an existing gravel road to restore a smooth running surface by re-establishing the construction surface tolerances and the design cross-section and longitudinal profiles across the full width of the carriageway and shoulders, and through to the side drain interface. After restoring the design cross section and longitudinal profiles the recovered material should be watered and compacted.

Medium grading also involves scarification, watering and compaction of the existing gravel road surface to restore a smooth running surface.

#### General Requirements

The Works shall be executed in accordance with Sections 1100, 1200, 1300, 1400, 1500 1700, 1800 and 7000 of the General Specifications with the following specifications of particular applications.

#### Construction

Starting at the side drain line the original cross-section and longitudinal profile shall be restored by grading off high points of surface irregularities and evenly spreading the arisings to low points, drawing the arisings inwards towards the centre of the road while travelling longitudinally.

The aforesaid grading operation shall be repeated in respect of the shoulders and then the carriageway.

#### Construction Tolerances

The as-built cross-section profile and longitudinal profile shall be re-established to a surface tolerance of plus or minus 12mm of the mean level, gradient and crossfall at the respective off-set from the centre-line of the road and shall not at any point be so formed as not to shed surface water.

#### Measurement and Payment

Item: Medium Grading of Gravel Roads ..... square metre (m2)

The unit of measurement shall be the square metre of the shoulders or gravel carriageway or Side drain interface, measured in final position after satisfactory completion of the execution of the works and acceptance by the Engineer; and the quality calculated from the authorised dimensions of the layer as shown on the Drawing or as directed by the Engineer.

The tendered rate shall include full compensation for the execution of all the Medium Grading works as specified.

### **M 213 Light Grading of Gravel Roads**

#### Scope of the works

Light grading is the pure blading by motor grader of the carriageway and possibly the shoulders at the direction of the Engineer of an existing gravel road to restore a smooth running surface by grading off the high points of surface irregularities and evenly spreading the arisings to low points, drawing the arising inwards towards the centre of the road while travelling longitudinally.

#### General Requirements

The Works shall be executed in accordance with Sections 1100, 1200, 1300, 1400, 1500, 1700, 1800 and 7000 of the General Specifications with the following specifications of particular application.

#### Construction

Starting at the outer limits of the light grading works be it the edge of shoulder or the edge of carriageway as directed by the Engineer the existing surface shall be lightly graded by use of the grader blade to blade off, the high points of surface irregularities and to evenly spread the arisings to low points, drawing the arisings inwards towards the centre of the road while travelling longitudinally.

The aforesaid grading operation shall be repeated as necessary until the full width and extent of the designated area has been graded as specified.

#### Construction Tolerances

The existing cross-section profile and longitudinal profile shall be graded to a surface tolerance of plus or minus 12 mm of the mean existing level, gradient and crossfall at the respective off-set from the centre-line of the road and shall not at any point be so formed as not to shed surface water.

#### Measurement and Payment

Item: Light Grading of Gravel Roads .....square metre (m<sup>2</sup>)

The unit of measurement shall be the square metre of the shoulders or gravel carriageway, measured in final position after the satisfactory completion of the execution of the works and acceptance by the Engineer; and the quantity calculated from the authorised dimensions of the layer as shown on the Drawing or as directed by the Engineer.

### **M214 Shoulder Grading of Paved Roads**

#### Scope of the Works

Shoulder grading of gravel shoulders is the pure blading by motor grader of gravel shoulders on an existing paved road to remove any extraneous deposits from the shoulder and to re-establish the design cross-section from the edge of carriageway through to the outer edge of shoulder; including the removal and disposal of arisings.

#### General Requirements

The Works shall be executed in accordance with Sections 1100, 1200, 1300, 1400, 1500 1700, 1800 and 7000 of the General Specifications with the following specifications of particular application.

#### Construction

The original cross-section and longitudinal profile of the shoulder shall be restored as far as practicable by grading off highpoints of surface irregularities and evenly spreading all suitable arisings to low points, from which all vegetation and deleterious material shall be removed and suitably disposed of.

The Contractor shall ensure the method of working takes care from the outset to avoid damaging the adjacent permanent works which, if damaged, shall be reinstated to the satisfaction of the Engineer all at the Contractor's cost. And in the event the crossfall of the shoulder is graded off in excess of the design crossfall and below finished level then the shoulder shall be reinstated by shoulder regravelling accordance with the Shoulder Regravelling specification, all at the Contractor's cost.

Upon completion of the shoulder grading the adjacent side drains and bituminous pavement shall be cleared of all construction debris and, upon removal the adjacent bituminous pavement shall be cleaned by use of the mechanical broom or other means approved by the Engineer to the satisfaction of the Engineer.

All arisings shall be removed and suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation, pavement or structures or adjacent public property in any way and all to the satisfaction of the Engineer.

#### Construction Tolerances

The as-built cross-section profile and longitudinal profile shall be graded off to a surface tolerance of plus or minus 12mm of the mean level, gradient and crossfall at the respective off-set from the centre-line of the road and shall not at any point be so formed as a result of the execution of the works as to exceed the specified crossfall or not to shed surface water.

#### Measurement and Payment

Item: Shoulder Grading or Paved Roads ..... square metre (m<sup>2</sup>)

The unit of measurement shall be the square metre, of the shoulders measured in final position after satisfactory completion of the execution of the works and acceptance by the Engineer; and the quantity calculated from the authorised dimensions of the layer as shown on the Drawing or as directed by the Engineer.

The tendered rate shall include full compensation for the execution of all the Shoulder Grading works as specified.

### **M215 Regravelling of Existing Roads**

#### Scope and Method of Work

Prior to placing and compaction, the Contractor shall delineate the work area using temporary traffic signs in accordance with Clause 1503 of the General Specifications.

The gravel wearing course material shall be deposited in such a quantity and spread in a uniform layer across the full width required, so that the final completed thickness is nowhere less than shown upon the Drawings or instructed by the Engineer.

The compacted thickness of any layer laid, processed and compacted at one time, shall not exceed 200 mm and where a greater compacted thickness is required, the materials shall be laid and processed in two or more layers. The minimum layer thickness shall be 100mm.

Prior to laying the wearing course gravel, the surface of the layer below shall be lightly watered. The layer below may be original ground, which has been re-centred, re-shaped and re-compacted, or imported subgrade.

Wearing course material, shall be broken down and any oversize material which cannot be broken down to the required size shall be removed to spoil at the Contractors expense.

The gravel wearing course shall be compacted to a dry density of at least 95% MDD (AASHTO T180). The moisture content at the time of compaction shall be between 75 and 105% of OMC. The Contractor may be required to dry or wet the material in order to comply with the moisture content requirement.

The wearing surface of the material shall, on completion of compaction be self draining and free from compaction planes, ridges, cracks or loose material. All loose, segregated or otherwise defective areas shall be removed and made good with new material to the full thickness of the layer and proof rolled.

Prior to the end of the Maintenance period, the Engineer may instruct the Contractor to regrade the wearing surface of the road. Regrading shall consist of all work necessary to return the road surface to that condition in which it was acceptable for the issuing of the Completion Certificate. It shall include watering, regrading and compaction of the surface of the road but shall not include regravelling any section of the road.

#### Junctions

Existing junctions, shall be re-surfaced with a 150mm layer of the same type of gravel as the adjacent carriageway compacted to 95% MDD AASHTO T190. The moisture content at the time of compaction shall be between 75 and 105% of the OMC.

Where directed by the Engineer the original surface shall be recentralised and compacted prior to placing the gravel wearing course.

#### General Requirements

The works shall be executed in accordance with relevant sections in General Specifications for roads and bridges January 2005 edition.

#### Equipment

In addition to the equipment specified for construction of gravel roads under the General Specifications, equipment shall be provided for the associated reinstatement of side drains.

#### Construction Tolerances

The as-built cross-section profile and longitudinal profile shall be re-established to a surface tolerance of plus or minus 15mm of the mean level, gradient and crossfall at the respective off set from the centreline of the road and shall not at any point be so formed as not to shed surface water.

#### Measurement and Payments

##### Regravelling

The unit of measurement shall be the cubic metre of each material.

The volume of material shall be calculated as the product of the instructed thickness, the instructed average width and the measured length along the approved centreline of the completed layer.

The rates shall include the provision, haulage, placing and compaction as specified and shown on the drawings, proof rolling as required and adjusting the material's moisture content.

##### Regrading

The unit of measurement shall be the kilometre of the carriageway.

Regrading, where instructed shall be measured by the kilometre, to the nearest 0.1 km, along the approved centreline of the road.

The rate of regrading shall include for all work necessary as required by the Engineer. It shall not include for the cost of regravelling any section of the road. Should this be necessary, the value of such work shall be ascertained and paid for as additional work.

#### Junctions

The rates entered by the Contractor for the main pavement works shall also apply to the construction of junctions where shown on the Drawings or instructed by the Engineer.

### **M 216 Bituminous Surface Treatment**

#### General

Bituminous construction work will not be permitted in adverse weather conditions.

The Contractor shall take every reasonable precaution to avoid fire or health hazards. Joints in successive course shall be staggered by 0.30m transversely and, if half width sealing is adopted, 0,15 m longitudinally.

Notwithstanding the provisions of clause 1001 of the General Specifications, the Contractor shall be responsible for making provision for all bitumen supplies required by him, including allowances for minor additional areas that may be ordered to be sealed, variations from the specified spray rates, and wastage.

#### Scope and method of work

Prior to the sealing operation being carried out, the primed road base surface of the surfacing of the existing pavement shall be thoroughly cleaned down. If water is used in the operation, the surface shall be thoroughly dry before sealing commences.

Any pothole shall be Filled with well-rammed hot premix made up by mixing well-graded (10 mm - dust) aggregate, derived from stone conforming to the requirements given in the General Specifications, The mix shall be "lean". Should any local or primed areas have become contaminated with dust, etc., such that in the opinion of the Engineer, the seal coat bitumen may have its adhering power inhibited, he may order a light tack coat of colas emulsion or similar to be applied prior to sealing, at the rate of 0.20 litres/m<sup>2</sup>.

All preparations described above shall be at the contractor's expense.

The single seal coat shall consist of Colacid spray or similar at a nominal rate of 1.30-1.50 litre/m<sup>2</sup> spread with 14mm nominal size chippings at the rate of 95m<sup>2</sup>/m<sup>3</sup> and for reconstructed areas, the seal coat shall consist of:

i) 1st seal coat: 80/100 penetration bitumen applied at a nominal rate of 1.50 litre/m<sup>2</sup> spread with 14mm nominal sized chippings at the rate of 95 m<sup>2</sup>/m<sup>3</sup>.

(ii) 2nd seal coal: 80/100 penetration bitumen applied at a nominal rate of 1.00 litre/m<sup>2</sup> spread with 10 mm nominal sized chippings at the rate of 130 m<sup>2</sup>/m<sup>3</sup>.

As soon as possible, but not later than three minutes after the bitumen for each seal coat has been sprayed, the chippings for that coat shall be applied by an approved mechanical spreader. Immediately the chippings have been spread, they, shall be initially rolled so that the whole area receives at least one pass within ten minutes of the bitumen sprayed, as specified in the table below.

After the initial rolling, any area which is deficient in chippings shall be made good by hand spreading. Brooming of the material to effect redistribution of chippings, will not be permitted.

MAXIMUM TIME, FROM SPRAYING OF BITUMEN (MINUTES)	MINIMUM NUMBER OF PASSES	TYPE OF ROLLER	WEIGHT OF ROLLER
0-10	1	Pneumatic tired	8 Mg Min.
10-30	2	-do-	-do-
30-60	2	Steel Wheeled	2 to 6 Mg
OVER 60*	2	-do-	-do-

- The final two passes termed “back-rolling” shall be given in the heat of the day. This only applies to double seal coats.

Note: Mg = metric tonne

No rollers or construction equipment shall be permitted to park on the completed work.

The second seal coat for a particular section should be applied as soon as practicable after the first seal application. Care should be exercised in order to avoid damage to the first seal coat by construction traffic, and to avoid contamination of the coat by dust, dirt, spillage, etc.

Unless directed otherwise by the Engineer, the road shall not be opened to other than construction traffic before the application of both coats.

The Contractor shall erect temporary speed restriction signs, and barriers as directed by the Engineer, to prevent public travelling too fast over the newly laid surface dressing, and shall enforce the same compliance by his own traffic.

Alter traffic has been permitted to run on the surface dressing for a period of at least two weeks and when directed by the Engineer, all loose material shall be swept to the side of the road, collected up and disposed of. Windrows of loose chippings shall not be allowed to remain at the sides of the road.

#### Measurement and Payment

Prime coat application shall be calculated from the areas directed to be sprayed by the Engineer and the application rate(s) ordered by the Engineer, and shall be measured and paid for by the litre. The rate is to include all necessary preparation of the road base surface and repairs to the same, all expenses incurred in priming in accordance with the requirements given above, and overheads and profit.

The seal coat (Pay Item “Single Seal Coat”) shall be measured by the square metre over the areas ordered to be sealed by the Engineer. The rates shall include for all expenses connected with spraying bitumen and applying chippings at the rates quoted in the Bill of Quantities. Should the bitumen application rates be varied by the Engineer, the additional or lesser quantities of bitumen used will be reflected in the “Bitumen binder variation” item also contained therein. If the actual application rates measured by the Engineer vary within + or - 10% of the rates ordered by him, the ordered rate shall be used for calculation of the bitumen binder variation quantity.

Should the actual application rate be more than 10% less than that ordered, the bitumen binder variation will be calculated using the actual application rates. Should the actual application rate be more than 10% over that ordered, the ordered rate shall be used for calculating bitumen binder variation. Both these last contingencies depend upon the Engineer’s accepting work where the variation in actual application rates varies by more than 10% from that ordered by

him, and he shall have power to condemn such work and order that defective seal coats be removed completely, should he think fit, and the work be carried out again at the Contractor's expense.

Should the application rates for chippings be varied by the Engineer after site trials, no adjustment will be made. No extra payment will be made in respect of "whip-off" of chippings, and the Contractor shall allow in his rates for such Work.

No additional payment will be made in respect of working in restricted areas such as access roads. etc., and the Contractor shall allow in his rates for such work.

The rates shall also include for all expenses involved in complying with the requirements of this section and those of the General Specifications, and the Contractor's overheads and profit, including compensation for land, crops building, etc., on the quarry, removing, overburden, constructing access road(s), complying with conditions of access, traffic control and signs, providing and installing machinery, plants, stores, offices and removal of the same and making good on completion and leaving site neat and tidy.

No overhaul will be paid for bitumen aggregates required for this work, being the relevant charges included in the rates entered in the Bills of Quantities.

## **2.6 Borrow Pits, Quarries and Environmental Requirements**

Foreword

The attention of the Contractor is specifically drawn to the requirements associated with Quarries and Borrow Pits and the protection requirements of the Environment.

The requirements of this chapter of Section IV-B are intended to supplement the Specification of the Ministry of Works and Transport.

Quarries and Borrow Pits General Scope

All work required to locate gravel pits, remove overburden, win and extract gravel and final reinstatement on completion shall be done in accordance with the Specifications of the Ministry of Works and Transport.

This part of Section IV-B covers the work involved in obtaining borrow materials for work under this Contract, including negotiations, except as provided hereinafter, with owners of the land on which borrow areas are situated, clearing the Site, stripping and disposing of excess overburden, excavating selected material for use of the Works, and finishing off the borrow areas.

The Contractor shall be required to obtain naturally occurring materials for the Works from sources within or outside the road reserve. It is the responsibility of the Contractor to locate, prove and propose for the Engineers approval sources of material. The selection shall be undertaken on an economic basis and minimise haulage.

All quarries and borrow pits shall be drained and kept drained and, where they have been excavated so that they will not drain naturally, they shall be kept pumped dry and back filled after work has finished.

Where the height of any face of the quarry or borrow pit is likely to be a danger either to the public or to animals, the Contractor shall provide, erect and maintain a shockproof fence and gates to prevent unauthorised access.

On completion of the work quarries, borrow pits and spoil to the sides of the excavations and spoil embankments shall be neatly trimmed to such slopes as shall be stable and safe for pedestrians and animals to negotiate.

Where it is impracticable to trim the faces to a reasonable slope the top edge shall be

permanently fenced to the satisfaction of the Engineer.

The Site shall, as far as is practicable, be left in its original condition and all temporary fences and structures shall be demolished and removed, all latrine pits, etc. filled in or drained and the Site left neat and tidy.

Material in spoil tips shall not interfere with the drainage or adjoining property and shall be spread in layers, finishing off with the edge trimmed to line and slope and the whole area left neat and tidy as directed by and to the satisfaction of the Engineer.

Except as specially included in the Bills of Quantities no separate measurement or payment will be made for any work included in this clause, the relevant costs of all these requirements be Included by the Contractor in the rates in his/her Bills of Quantities for other work items.

#### **Negotiations with Owners and Authorities**

- a) The Contractor shall, before entering private property for the purpose of opening borrow pits, constructing access roads, temporarily occupying certain land or inspecting the areas concerned, negotiate with and serve notice upon the owners of his/her intention of doing so, all in accordance with National legislation, and the provisions of Clause 1 hereof.
- b) The Contractor shall settle all claims in respect of royalties, loss of crops or other matters to which the owner may be entitled in terms of National legislation as a result of the Contractor's entering upon, and temporary occupation of private land, use of haul roads and his/her removal of material from the landowner's property.
- c) In the event of negotiations with the owners of the property proving to be either impossible, unduly delaying or if an equitable solution cannot be reached, the Contractor may refer the matter to the Engineer for his/her consideration from the landowner's property.

#### **Obtaining of Borrow Materials**

- a) Borrow Pit Locations

Borrow materials shall be located and obtained by the Contractor. Borrow material shall comply with the requirements of the Specifications for the use for which the material is intended.

The Contractor shall search for and test all possible sources of borrow material including any possible sources so designated by the Engineer, within an economic distance of the location where the borrow materials is to be utilised.

The Contractor shall excavate the necessary trial holes, take such samples and either perform at his/her own laboratory or have performed at the Ministry of Works Central Material Laboratory or the portable laboratory as directed, such tests as are deemed necessary by the Engineer. The Contractor shall submit all the results to the Engineer in sufficient detail to satisfy him that the quality and quantity of material available in the proposed borrow area are acceptable for the intended use, all at the Contractor's expense. The Contractor shall propose the use of those borrow pits which will be most economic to the Employer.

Approval of borrow pits or borrow areas shall apply only to those portions of the pit or area from which acceptable materials can be obtained or produced. The Contractor shall conduct this Operations in any approved pit or borrow area or portions thereof so as to produce acceptable material.

Any approval given by the Engineer shall not relieve the Contractor of the responsibility of ensuring that material obtained from a borrow pit or area complies in all respects with the specification for the material.

- b) Use of Borrow Materials

The decision as to which source of supply the Contractor shall operate from at any time shall rest with the Engineer. The Contractor shall at any stage of the work operate from that approved source of supply which in the opinion of the Engineer is the most suitable having regard to the quality and quantities of the various types of materials available and the ultimate cost of the work to the Employer. No payment will be made for moving of the Contractor's equipment from one location to another at any of the individual sources approved by the Engineer.

The Contractor shall plan his/her exploitation of the borrow pit in such a manner that the various materials excavated can be in selected and either loaded directly for use or pushed to stockpile in the borrow area for later loading. When this is not feasible for reasons beyond the Contractor's control, material to be reserved for later use shall be loaded, hauled and temporarily stockpiled as ordered by the Engineer at locations outside the borrow area indicated by him and such temporary stockpiling shall be measured and paid for as specified in Clause 3610.

No material reserved for a specific purpose shall be used for other purposes without the written approval of the Engineer.

### **Opening and Working Borrow Pits**

#### a) Clearing and Grubbing, Topsoil and overburden

The Contractor's rate for borrowed material must include for clearing and grubbing and the removal of topsoil and overburden.

#### b) Excavation of Borrow Material

Where any borrow pit contains different types of materials, in separate layers which require to be mixed in order to produce a suitable product, the materials shall be excavated over the full depth of approved face in one operation without separation of the different types of materials.

The Contractor shall exercise all reasonable care so as to avoid contaminating of approved borrow material by the inclusion of clayey or otherwise unsuitable material from the floor of the borrow pit, from overburden, from unsuitable layers or from areas beyond the approved limits of the borrow area. During loading hard oversize material which will not break down during processing on the road shall be excluded as far as is practicable.

During the process of borrow operations and especially when excavating near the floor and outer boundaries of borrow areas the Contractor shall plan his/her operations so as to reduce as far as possible the amount of earth moving that will be necessary for the finishing off of borrow pits. Indiscriminate excavation without due regard for the desired final shape of the borrow pit will not be permitted.

The material in borrow pits shall be blasted or ripped and/or excavated in a manner that will ensure the effective breaking down of the material in the borrow pit before it is loaded. Rippable material which tends to break into large blocks shall be cross ripped.

#### c) Control at Borrow Pit

The Contractor shall be responsible for controlling his/her operations at every borrow pit where material is being excavated, to ensure compliance with the requirements of Sub-clause 3405(a).

He shall carry out sufficient tests on the material being excavated from the borrow pit in order to satisfy himself that the quality of the material will comply with the specified requirements for the particular layer for which it will be used.

#### d) Protection of Borrow Pits

Borrow pits shall be continuously protected against the ingress of surface water and the Contractor shall construct such temporary banks as may be required to divert surface water and as far as possible his/her operations shall be planned in such a way that the borrow pit is self draining. Where this is not possible, borrow pits shall be de-watered by pumping. The Contractor shall be solely responsible for keeping borrow areas dry and ensuring that borrow material is sufficiently dry when required for use.

### **Finishing off Borrow Areas**

On completion of his/her operations in a borrow area the Contractor shall reinstate the entire area so as to blend with the surrounding area and to permit the re-establishment of vegetation. For this purpose the borrow area shall be shaped to even contours. All material in and around the borrow area, whether spoil from road building operations, excess stock-piled material, oversized material left in the borrow pit, material resulting from clearing and grubbing operations and excess overburden, shall be used or disposed of as directed by the Engineer. Material not capable of supporting vegetation shall be buried and used in shaping the borrow area and subsequently covered with soft material. All available soft material shall be spread evenly to the thickness directed and where sufficient material is not available for this purpose to cover the entire area, the remaining portions shall be scarified along the contours so as to avoid undue erosion.

All haul roads shall be obliterated and the surface scarified, earth banks constructed to prevent erosion and all damaged fences and other structures reinstated.

The shaping and finishing-off of the borrow pit shall be done in such a way that the borrow pit will be properly drained whenever practicable and where required the Contractor shall place earth-banks to divert any surface water away from the borrow area.

The finishing-off of any borrow pit shall be to the entire satisfaction of the Engineer, and the Contractor shall submit to the Engineer a signed certificate from the landowner stating that he is fully satisfied with the finishing-off of any borrow area. The Contractor's attention is drawn to the provision of Clause 1213 in this respect.

The Contractor may be required to build an embankment and plant it with appropriate trees, bushes or other vegetation to form a screen to mask borrow pits where for-example these are left for maintenance purposes.

### **Disposal of Borrow Material**

The Contractor shall not have the right to use material obtained from borrow pits for any purpose other than for the execution of this Contract. He/she shall not dispose of any borrow material whether processed or not either by sale or donation to any person without the written authority of the Employer.

### **Borrow Pit Classification of Gravel Materials for Pavement Layers**

No additional payment will be made for excavation or processing material from borrow pits, regardless of the hardness or other properties of material.

The Engineer shall have the right to decide which borrow pit the Contractor shall operate from any particular stage of the work; to approve new borrow pits during the construction period; and to deviate from the estimated quantities shown in the Bills of Quantities.

### **Measurement and Payment**

Procuring and furnishing borrow material shall not be payable directly, but shall be considered as a subsidiary obligation of the Contractor covered under the contract prices paid for the various items of work. Certain items of work shall, however, be paid for separately where so specified.

Procuring and furnishing borrow materials shall include full compensation for all obligations, expenses, operations and work prescribed in Section 1200 of the Specifications as well as all supervision, labour, equipment, tools and incidentals necessary thereto, including all such expenses as may be necessary to control test all materials, to drain and protect borrow areas and to complete all negotiations with and payment to landowners as specified as well as clearing and grubbing, removal of top soil and overburden and the final shaping and finishing-off of the borrow pit.

The Contractor shall be required to obtain naturally occurring materials for the Works from sources within or outside the road reserve. It is the responsibility of the Contractor to locate, prove and propose for the Engineer's approval of sources of material. The selection shall be undertaken on an economic basis and minimise haulage.

All quarries and borrow pits shall be drained and kept drained and, where they have been excavated so that they will not drain naturally, they shall be kept pumped dry and back filled after work has finished.

Where the height of any face of the quarry or borrow pit is likely to be a danger either to the public or to animals, the Contractor shall provide, erect and maintain a shockproof fence and gates to prevent unauthorised access.

On completion of the work quarries, borrow pits and spoil to the sides of the excavations and spoil embankments shall be neatly trimmed to such slopes as shall be stable and safe for pedestrians and animals to negotiate.

Where it is impracticable to trim the faces to a reasonable slope the top edge shall be permanently fenced to the satisfaction of the Engineer.

The Site shall, as far as is practicable, be left in its original condition and all temporary fences and structures shall be demolished and removed, all latrine pits, etc. filled in or drained and the Site left neat and tidy.

Material in spoil tips shall not interfere with the drainage or adjoining property and shall be spread in layers, finishing off with the edge trimmed to line and slope and the whole area left neat and tidy as directed by and to the satisfaction of the Engineer.

Except as specially included in the Bills of Quantities no separate measurement or payment will be made of any work included in this clause, the relevant cost of all these requirements being included by the Contractor in his/her rates in the Bills of Quantities for other work items.

### **Environmental Protection and Waste Disposal**

#### **Landscape Preservation**

The Contractor shall exercise care to preserve the natural landscape and shall conduct his/her construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent works, approved construction roads, or excavation operations, all trees, native shrubbery, and vegetation shall be preserved and shall be protected from damage by the Contractor's construction operations and equipment. The edges of clearings and cuts through trees, shrubbery, and vegetation shall be irregularly shaped to soften the undesirable visual impact of straight lines. Movement of labour and equipment within the right-of-way and over routes provided for access to the work shall be performed in a manner to prevent damage to grazing land, crops or property.

The location, alignment and grade of construction roads shall be subject to approval of the Engineer. When no longer required by the Contractor, construction roads shall, if required by the Engineer, be restored to the original contour and made impassable to vehicular traffic.

The surfaces of such construction roads shall be access to pits scarified as needed to provide a condition which will facilitate natural re-vegetation, provide for proper drainage, and prevent erosion.

The Contractors workshops, offices and yard area shall be located and arranged in such a manner as to preserve trees and vegetation to the maximum practicable extent. On abandonment, all temporary buildings, including concrete footings and slabs, and all construction materials and debris shall be removed from the site. The area shall be removed, as required, so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural vegetation, provide for proper drainage and prevent erosion.

#### Prevention of Water Pollution

The Contractors construction activities shall be performed by methods that will prevent entrance, or accidental spillage, of solid matter, contaminants, debris and other pollutants and wastes into streams, flowing or dry watercourses, lakes and underground water sources. Such pollutants and wastes include, but are not restricted to refuse, garbage, cement, and concrete, sanitary waste, industrial waste, radioactive substances, oil and other petroleum products, aggregate processing tailings, mineral salts and thermal pollution.

#### Compliance with Laws and Regulations

The Contractor shall comply with all applicable Ugandan laws, orders, regulations and water quality standards concerning the control and abatement of water pollution.

#### Abatement of Air Pollution

The Contractor shall comply with applicable Ugandan laws regulations concerning the Prevention and control of air pollution.

Notwithstanding the above in conduct of construction activities and operation of equipment, the Contractor shall utilise such practicable methods and devices as are reasonably available to control, prevent and otherwise minimise atmospheric emissions or discharges of air contaminants. Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments, or other inefficient operating conditions, shall not be operated until corrective repairs or adjustments are made.

Burning of materials resulting from clearing of trees and bush, combustible construction materials, and rubbish will be permitted only when atmospheric conditions (or burning are considered favourable and when authorised by the Engineer. In lieu of burning, such combustible materials may be disposed of by other methods as approved by the Engineer.

Where open burning is permitted, the burn piles shall be properly constructed to minimise smoke and in no case shall unapproved materials, such as tyres, plastics, rubber products, asphalt products or other materials that create heavy black smoke or nuisance odours, be burned.

#### Dust Abatement

During the performance of the work required by these specifications or any operations appurtenant thereto, whether on right-of-way provided by the Employer or elsewhere, the Contractor shall furnish all the labour, equipment, materials and means required and shall carry out proper and efficient measures wherever and as often as necessary to reduce the dust nuisance and to prevent dust which has originated from his/her operations from damaging crops, orchards, cultivated fields and dwellings or causing a nuisance to persons. The Contractor will be held liable for any damage resulting from dust originating from his/her operations under these specifications on the right-of-way or elsewhere. The Engineer may direct sprinkling or other measures for dust abatement as necessary to obtain adequate control.

The cost of complying with this paragraph shall be included in the prices tendered in the Bills of Quantities for other items of work.

#### Clean up and Disposal of Waste Materials

The Contractor shall, at all times, keep the construction area, including storage areas used, free from accumulations of waste materials or rubbish.

All waste water and sewage from office, residential and mobile camps shall be piped to soak pits or other disposal areas constructed in accordance with local government regulations, and where and when such regulations require it the Contractor shall obtain a permit or other appropriate documentation approving the disposal methods being used. All used fuels, other plant or vehicle fluids, and old tyres and tubes shall be collected to a central disposal point, on a regular basis and disposed as specified below.

All household, office, workshop and other solid waste shall be collected to a central disposal area on a daily basis and disposed of in a manner approved by the Engineer.

Servicing of plant, equipment and vehicles shall whenever possible be carried out at a workshop area. This workshop area shall be equipped with secure storage areas for fuels oils and other fluids constructed in such a way as to contain any spillage's which may occur and similar where used fluids can be stored securely prior to their disposal.

When servicing of plant, equipment and vehicles is carried out away from the workshop area it shall be done at locations and in such a manner as to avoid spillage and contamination of streams and other drainage courses.

Any spillages shall be cleaned up by either burning, in place or collecting the contaminated soils and burning in place or collecting the contaminated soils and burning them at the central disposal area all to the satisfaction of the Engineer.

Prior to completion of the Work, the Contractor shall remove from the vicinity of the work all plant facilities, buildings, rubbish, unused materials, concrete and other like materials belonging to him or used under his/her direction during construction.

All work areas shall be graded and left in a neat manner conforming to the natural appearance of the landscape.

Any residue deposited on the ground from washing out transit mix trucks or any similar concrete operations shall be buried or cleaned up in a manner acceptable to the Engineer.

In the event of the Contractor's failure to perform the above work, the work may be performed by the Employer, at the expense of the Contractor and his/her surety or sureties shall be liable therefore.

#### Measurement and Payment for Environment Protection and Waste Disposal

Except as specifically included in the Bills of Quantities or otherwise provided above no separate measurement or payment will be made for any work included in this Clause, the relevant cost of all these requirements being included by the Contractor in his/her rates in the Bills of Quantities for other items of work.

### 3 ROAD MAINTENANCE PERFORMANCE SPECIFICATIONS

These road maintenance performance specifications are to be used for maintenance activities that are carried out on engineered roads, when performing activities on non-engineered roads or on heavily deteriorated roads, the work methods have to be adjusted according to the specific needs, circumstances and funding possibilities.

#### 3.1 Labour-based Maintenance Performance Specifications

REPUBLIC OF UGANDA MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 1 Inspection and Removal of Obstacles	Priority  1	Activity Type  Routine	Road Type  Paved and Gravel
Work Definition			
Identification and disposal of obstructions (e.g. dead animals, minor anthills, earth slips, fallen trees etc.)			
Labour Work Supervisor Foreman Labourers		Standard/Specifications  L 1	
Tools  Claw Bars Shovels Matches Hoes Rakes Pick axes Axes Ropes Wheel Barrows Timber Planks	Traffic Signs Work in Progress Go slow Red/Green Flags Cones Diversion	Material       N/A	
Work Method			
<ol style="list-style-type: none"> <li>1. Determine the scope of work</li> <li>2. Institute safety measures</li> <li>3. Dispose of the obstruction</li> <li>4. Remove the safety signs to open the road</li> </ol>			
Special Considerations			
<ol style="list-style-type: none"> <li>1. If the obstruction is a dead animal, bury in to 1 m deep pit.</li> <li>2. In case of anthills special treatment should be given.</li> <li>3. If it is any other fallen material on the road, it shall be disposed off the road reserve.</li> </ol>			
Method of Measurement Lump sum		Average Daily Production N/A	

REPUBLIC OF UGANDA MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 2	Priority	Activity Type	Road Type
Clean side drains	1	Routine	Paved and Gravel
Work Definition			
Clear all vegetation, silts and debris including disposal			
Manpower		Standard/Specifications	
Work Supervisor		L 2	
Labourers			
Tools	Traffic Signs	Material	
Spades Hoes Pick axes Templates Wheel Barrows	Work in Progress Cones	N/A	
Work Method			
<ol style="list-style-type: none"> <li>1. Identify sections of the side drains containing (silt, vegetation, debris and ponding waters).</li> <li>2. Drain of ponding water from the side drains</li> <li>3. Remove silt, vegetation or debris and dispose.</li> <li>4. Shape side drains to required dimensions.</li> </ol>			
Special Considerations			
Material removed shall be disposed at least 10m from the centreline of the road or as directed by the Engineer.			
Section with Cliffs, urban centres to be given consideration for disposal.			
Method of Measurement		Average Daily Production	
Linear metres		Fully silted 30m/day/person Half silted 50m/day/person	

REPUBLIC OF UGANDA MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 3 Reinstate/repair scour checks	Priority  1	Activity Type  Routine	Road Type  Gravel and Paved
Work Definition Repair/Replace Scour checks made of stone or wood			
Manpower Artisans Labourers Work Supervisor		Standard/Specifications L 3	
Tools Wheel barrow Panga Axes Hammer Spades Hoes	Traffic signs  Work in Progress Cones	Material  - Stones - Wooden pegs	
Work Method			
<ol style="list-style-type: none"> <li>1. Identify side drains where scour checks are required</li> <li>2. Prepare stone or wooden pegs (min. 1.40cm)</li> <li>3. Construct scour checks.</li> <li>4. Clear site</li> </ol>			
Special Considerations Scour Check Spacing: Less 4% gradient – not required 5% gradient – 20m interval 8% gradient – 10m interval 10% gradient – 5m interval  In insecure condition scour checks shall be installed firmly			
Method of Measurement		Average Daily Production	
Number		4 pcs/day/person	

REPUBLIC OF UGANDA MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 4  Reinstatement of eroded ditches	Priority  1	Activity Type  Routine	Road Type  Gravel and Paved
Work Definition			
Repair eroded ditches including side drains with suitable material			
Labour Work Supervisor Labourers		Standard/Specifications  L 4	
Tools  Hoes Spades Rammers	Traffic signs  Work in Progress  Cones	Material  - Murrum/gravel - Stones - Concrete (sand, cement)	
Work Method			
<ol style="list-style-type: none"> <li>1. Identify eroded side drains.</li> <li>2. Clean area to work on.</li> <li>3. Fill with suitable materials to the required shape and compact (construct to fall)</li> </ol>			
Special Considerations			
<ul style="list-style-type: none"> <li>- Compaction where required</li> <li>- Right shape</li> <li>- Suitable material</li> <li>- Dimensions</li> <li>- Relative location with respect to road centreline</li> </ul>			
Method of Measurement		Average Daily Production	
Linear metres/m		30m/day/person	

REPUBLIC OF UGANDA MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 5  Clean mitre/catch water drains	Priority  1	Activity Type  Routine	Road Type  Gravel and Paved
Work Definition			
Clear all silt, debris, vegetation and ponded water and dispose of appropriately			
Manpower Work Supervisor Manual - Headman Labourer		Standard/Specifications  L 5	
Tools Spades Hoes Pick axes Templates Wheel Barrows	Traffic signs  Work in Progress Cones	Material	
Work Method			
<ol style="list-style-type: none"> <li>1. Identity mitre drains containing silts, vegetation, debris and ponded water.</li> <li>2. Remove silts, vegetations, debris and drain off ponded water</li> <li>3. Shape the mitre drains.</li> <li>4. Dispose all material removed appropriately.</li> </ol> <p>The material removed shall be disposed at least 5m from drain and not less than 10 from the road centreline.</p>			
Special Considerations			
<p>In case the mitre drain is on slope, then material should be disposed on the descending side away the drain.</p> <p>Mitre drains formed by traxcavators may be given special consideration.</p>			
Method of Measurement		Average Daily Production	
Linear metres/m		Fully silted 40m/day/person Half silted 60m/day/person	

REPUBLIC OF UGANDA MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 6  Clean culverts	Priority  1	Activity Type  Routine	Road Type  Gravel and Paved
Work Definition			
Unblock all silted culverts including inlets, outlets and outflow channels			
Manpower Work Supervisor, contractors - Headman - Labourer		Standard/Specifications  L 6	
Tools  Torch, spirit level Long scoops Shovel Wheel Barrows Hoe Rake Panga Slasher	Traffic signs  Road Cones	Materials  N/A	
Work Method			
<ol style="list-style-type: none"> <li>1. Identify culvert for cleaning outlets according to diameter.</li> <li>2. Remove/Excavate all debris and silt up to invert levels. Set out and clear down at outlet.</li> <li>3. Clear inlet, vegetation, soil to specified fall to a maximum distance of 20m.</li> <li>4. Dispose</li> </ol>			
Special Considerations			
<ul style="list-style-type: none"> <li>- Outflow channels in excess of 20m to be treated as mitre drains.</li> <li>- 50m checks for outfall</li> <li>- The removed surplus/material shall be disposed of clean from outfall channel a distance of not less than 5m</li> </ul>			
Method of Measurement Unit: Linear metres (Measured length of Culverts)		Average Daily Production - Full silted – 4m/day/person - Half silted – 8m/day/person	

REPUBLIC OF UGANDA MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 7  Clean stream channels	Priority  1	Activity Type  Routine	Road Type  Paved and Gravel
Work Definition			
Clean all stream channels of debris and vegetation to ease the flow of water through bridges and culverts.			
Manpower Work Supervisor Headman Labourers		Standard/Specifications  L 7	
Tools  Shovels Forked hoe Rake Panga Slasher Canoe	Traffic signs  Red cones	Material  Protective wear (boots)	
Work Method			
<ol style="list-style-type: none"> <li>1. Define working areas both at inlet and outlet.</li> <li>2. Remove all vegetation, debris and dispose off 5m away from the edge of stream</li> </ol>			
Special Considerations Stream Channels shall be clear of debris and vegetation all the time 10 m both upstream and downstream and uniform width of stream maintained.			
Method of Measurement Unit: Linear metre/m (Measured length of stream channel)		Average Daily Production  15m/day/person	

REPUBLIC OF UGANDA MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 8	Priority	Activity Type	Road Type
Clean catch water drain	1	Routine	Paved and Gravel
Work Definition			
Clear all silt, debris, vegetation and ponded water and dispose of appropriately.			
Manpower		Standard/Specifications	
Work Supervisor		L 5	
Labourer			
Headman			
Tools	Traffic signs	Material	
Spades Hoes Templates Wheel Barrows	Cones		
Work Method			
<ol style="list-style-type: none"> <li>1. Identify, catchwater drains containing silts, vegetation, debris and ponded waters.</li> <li>2. Remove silts, vegetation, debris and drain of ponded waters.</li> <li>3. Shape the catch water drains to the correct size.</li> <li>4. Dispose all materials removed appropriately.</li> </ol>			
Special Considerations			
Material shall be disposed at least 5 metres from the drain and on the near side of the drain or as directed by the Engineer.			
Terrain during disposal of debris may be given special consideration.			
Method of Measurement		Average Daily Production	
Linear metres/m		Fully silted 25m/day/person Half silted 40m/day/person	

REPUBLIC OF UGANDA MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 9  Fill potholes	Priority  1	Activity Type  Routine	Road Type  Gravel/Earth
Work Definition  Filling of potholes that have developed on the carriageway using approved material.			
Manpower  Work Supervisor  Headman  Labourer		Standard/Specifications  L 8	
Tools  Wheel barrows Spades/shovels Hoes Rakes Rammers	Traffic signs  Work in Progress  Cones	Material  Approved material	
Work Method  1. Identify area. 2. Set up safety signs and devices. 3. Remove weak material from pothole and dig out until firm ground/material is reached. 4. Fill in new material in layers not more than 150 mm. 5. Compact each layer adequately.			
Special Considerations Material used should be in accordance with the existing inventory course, should be done filling, ramming should be in when filling. MOWT to provide approved material to a distance not more than 100m where necessary.			
Method of Measurement  Square metres/m <sup>2</sup>		Average Daily Production  30m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. 10  Fill minor gullies	Priority  1	Activity Type  Routine	Road Type  Gravel/Earth
<b>Work Definition</b> Filling of gullies that have developed on the carriageway using approved material.			
<b>Manpower</b>  Work Supervisor  Headman  Labourer		<b>Standard/Specifications</b>  L 8	
<b>Tools</b>  Wheel barrows Spades/shovels Hoes Rakes Rammers	<b>Traffic signs</b>  Work in Progress  Cones	<b>Material</b>  Approved material	
<b>Work Method</b>  1. Identify area. 2. Set up safety signs and devices. 3. Remove weak material from gullies and dig out until firm ground/material is reached. 4. Fill in new material in layers not more than 150 mm. 5. Compact each layer adequately.			
<b>Special Considerations</b> Material used shall be in accordance with the existing inventory course, should be filled, rammed and filled again up to acceptable thickness and level. MOWT to provide approved material to a distance not more than 100m where necessary.			
<b>Method of Measurement</b>  Square metres/m <sup>2</sup>		<b>Average Daily Production</b>  30 m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 11  Grubbing	Priority  1	Activity Type  N/A	Road Type  Gravel
Work Definition  Grubbing to reinstate road camber.			
Manpower  Headman Labourer		Standard/Specifications  L 9	
Tools  Hoes Rakes Shovels	Traffic Signs  Work in Progress	Material  Existing material	
Work Method  <ol style="list-style-type: none"> <li>1. Identify sections that need grubbing.</li> <li>2. Set up safety signs.</li> <li>3. Set up with pegs and string the width and crossfall.</li> <li>4. Rake existing material to original level and tamp.</li> </ol>			
Special Considerations  <ul style="list-style-type: none"> <li>- Item only to be instructed if the lump sum is sufficient to cover the required work.</li> <li>- The Contractor shall inform and seek authority to carry out activity.</li> <li>- Only to be covered out as and when directed in writing by the Engineer.</li> </ul>			
Method of Measurement  Square metres/m <sup>2</sup>		Average Daily Production  70 m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. 12	Priority	Activity Type	Road Type
Repair shoulder slope erosion	2	Routine	Gravel/paved
<b>Work Definition</b>			
Re-instatement of eroded shoulders and ditch slopes with appropriate material.			
Manpower		Standard/Specifications	
Headman Labourer		L 10	
Tools	Traffic Signs	Material	
Wheel barrows Spades/shovels Hoes Rakes Rammers	Work in Progress  Cones	Approved material	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify eroded shoulders.</li> <li>2. Set up safety signs and devices.</li> <li>3. Place material on damaged shoulders and slopes.</li> <li>4. Rake the material to original level.</li> </ol>			
<b>Special Considerations</b>			
Shoulders to be repaired to the gradient. Material used should be in accordance with the existing shoulder material. Where grass exists on the shoulder, it should be kept low to assist in preventing shoulder erosion and ease drainage.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		90m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 13  Weed Shoulders	Priority  2	Activity Type  Routine	Road Type  Gravel/paved
Work Definition  Weed along the shoulder edge in order to stop grass from encroaching to the carriageway.			
Manpower  Headman Labourers		Standard/Specifications  L 12	
Tools  Spades/shovels Hoes Rakes	Traffic Signs  Work in Progress  Cones	Material  N/A	
Work Method  1. Identify grass covered shoulder edges. 2. Set up safety and devices. 3. Weed. 4. Remove grass and roots from shoulder and dispose off the road reserve.			
Special Considerations  Use pegs and strings to clearly mark the shoulder edge on gravel and earth roads to guide the labourers. Dispose off weed not less than 10 m distance from the side drain.			
Method of Measurement  Square metres/m <sup>2</sup>		Average Daily Production  70m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. 14  Grass cutting	Priority  2	Activity Type  Routine	Road Type  Gravel/paved
<b>Work Definition</b> Cut grass to specified level			
<b>Manpower</b> Labourers		<b>Standard/Specifications</b> L 11	
<b>Tools</b> Slashers Sickles File Panga	<b>Traffic Signs</b> Flags	<b>Material</b>  N/A	
<b>Work Method</b> 1. Identify where grass is more than 75 mm high. 2. Cut grass to a width of 3m from the side ditch. 3. Clean the cut area of debris.			
<b>Special Considerations</b>  Grass should be cut to a width of not less than 10m from the ditch or 12m from the shoulder at the inner side of road curves. Dispose debris not less than 5 m from side drains.			
<b>Method of Measurement</b> Square metres/m <sup>2</sup>		<b>Average Daily Production</b> 1000m <sup>2</sup> /day/person	

## Road Maintenance Specifications

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. 15	Priority	Activity Type	Road Type
Bush/Shrub clearing	3	Routine	Paved and Gravel
<b>Work Definition</b> Clear the road reserve of all bush/shrubs and remove the resultant debris			
<b>Manpower</b> Labourers		<b>Standard/Specifications</b> L 13	
<b>Tools</b> Slashers Pangas Axes Sickles	<b>Traffic Signs</b> Flags	<b>Material</b> N/A	
<b>Work Method</b> 1. Identify where there is bush. 2. Institute safety signs where required. 3. Cut bush to a width of 3m from side ditch on both sides of the road. 4. Clear cut debris off road reserve. 5. Remove safety signs to open the road.			
<b>Special Considerations</b> Clear the road reserve of all bush/shrubs to a level not exceeding 150 mm height to ensure visibility to road users. Bush should be cut to a width of not less than 10m from the ditch or 12m from the shoulder at the inner side of round curves			
<b>Method of Measurement</b> Square metres/m <sup>2</sup>		<b>Average Daily Production</b> 150m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 16	Priority	Activity Type	Road Type
Grass planting	N/A	N/A	Paved and Gravel
<b>Work Definition</b>			
Plant paspuram where required beyond the side drain			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Labourers		As directed by the Engineer.	
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
As appropriate Hoe Watering can Shovel	As appropriate	Paspuram plant	
<b>Work Method</b>			
- Remove any thick bushes and plant paspuram			
<b>Special Considerations</b>			
<ul style="list-style-type: none"> <li>- Item only to be instructed if the lump sum is sufficient to cover the required work.</li> <li>- The Contractor shall inform and seek authority to carry out activity.</li> <li>- Only to be covered out as and when directed in writing by the Engineer.</li> <li>- Spacing should be 300mm x 300mm (1ft x 1ft)</li> </ul>			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		50 m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 17	Priority	Activity Type	Road Type
Tree planting	N/A	N/A	Paved
<b>Work Definition</b>			
Plant trees along the paved roads as specified			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Labourers		L 14 As directed by the Engineer	
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
As appropriate Hoe Shovel Watering can	As appropriate	Tree seedlings Soil	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Dig a 300mm deep pit of 300mm diameter.</li> <li>2. Plant a tree seedling provided by MOWT.</li> <li>3. Back fill with top agricultural soil.</li> </ol>			
<b>Special Considerations</b>			
<ul style="list-style-type: none"> <li>- Item only to be instructed of the lump sum is sufficient to cover the required work.</li> <li>- The Contractor shall inform and seek authority to carry out activity.</li> <li>- Only to be carried out as an if directed in working by the Engineer</li> <li>- Spacing shall be 20m apart and 3 m from the side drain.</li> <li>- The pit should be 300 mm (1ft) diameter and 300mm (1ft) deep.</li> </ul>			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Number		20 pcs/day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. 18	Priority	Activity Type	Road Type
Tree Nursing	N/A	N/A	Paved and Gravel
<b>Work Definition</b>			
Weed around the tree and water as necessary			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Labourers		L 15	
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
Hoe Shovel Watering can	As appropriate	Water soil	
<b>Work Method</b>			
1. As appropriate.			
<b>Special Considerations</b>			
<ul style="list-style-type: none"> <li>- Maintenance must be guaranteed for at least 4 months.</li> <li>- Constant weeding around the tree is required.</li> <li>- Only to be carried out as and when directed in writing by the Engineer.</li> </ul>			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Number		40 pcs/day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 19	Priority	Activity Type	Road Type
Removal of debris and silt	1	Routine	Paved and Gravel
<b>Work Definition</b>			
Remove all silt and debris including disposal from carriageway			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		L 16	
Labourers			
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
Brooms	Work in Progress		
Spades			
Wheel Barrows	Cones	N/A	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify the road containing silt and debris.</li> <li>2. Broom the road</li> <li>3. Remove silt and debris and dispose.</li> </ol>			
<b>Special Considerations</b>			
Material removed shall be disposed at least 10m from the centreline of the road or as directed by the Engineer.			
Roads in urban centres to be given consideration for disposal.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		30m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. 20	Priority	Activity Type	Road Type
Sweeping the road	1	Routine	Paved and Gravel
<b>Work Definition</b>			
Sweep the road using a broom			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		L 17	
Labourers			
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
Brooms	Work in Progress		
Spades			
Wheel Barrows	Cones	N/A	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify the road containing aggregates, sand, silt and debris.</li> <li>2. Broom the road</li> <li>3. Remove aggregates, sand, silt and debris and dispose.</li> </ol>			
<b>Special Considerations</b>			
Material removed shall be disposed at least 10m from the centreline of the road or as directed by the Engineer			
Access roads and roads in urban centres to be given consideration for disposal.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		30m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 21	Priority	Activity Type	Road Type
Maintain footpaths	1	Routine	Paved and Gravel
<b>Work Definition</b>			
Maintain footpaths by weeding and removal of grass			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		L 18	
Labourers			
<b>Tools</b>		<b>Material</b>	
Slashers			
Pangas			
Wheel Barrows		N/A	
Traffic Signs			
Work in Progress			
Cones			
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify the footpath to be weeded.</li> <li>2. Weed grass at least 1 m wide.</li> <li>3. Remove weed and dispose at least 5 m from the footpath.</li> </ol>			
<b>Special Considerations</b>			
Footpath in urban centres to be given consideration for disposal.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		30m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 22	Priority	Activity Type	Road Type
Miscellaneous	N/A	N/A	Paved and Gravel
<b>Work Definition</b>			
Felling and removal of big trees, removal of anthills and anything not covered by Activity Nos 1 to 25			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Labourers		As directed by the Engineer.	
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
As appropriate	As appropriate	As appropriate	
<b>Work Method</b>			
1. As appropriate.			
<b>Special Considerations</b>			
a. Item only to be constructed if the lump sum is sufficient to cover the required work.			
b. The Contractor shall inform and seek authority to carry out activity.			
c. Only to be carried out as and when directed in writing by the Engineer.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Lump sum		N/A	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 23	Priority	Activity Type	Road Type
Bridge Deck Sweeping	1	Routine	Paved and Gravel
<b>Work Definition</b>			
Sweep all aggregates, sand, silt and debris including disposal from bridge deck			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		L 20	
Labourers			
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
Brooms	Work in Progress		
Spades			
Wheel Barrows	Cones	N/A	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify the bridge containing aggregates, sand, silt and debris.</li> <li>2. Broom the deck</li> <li>3. Remove aggregates, sand, silt and debris and dispose.</li> </ol>			
<b>Special Considerations</b>			
Material removed shall be disposed at least 10m from the centreline of the road or as directed by the Engineer.			
Bridges in urban centres to be given consideration for disposal.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		30m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. 24	Priority	Activity Type	Road Type
Expansion joint cleaning	1	Routine	Paved and Gravel
<b>Work Definition</b>			
Clean all aggregates, sand, silt and debris including disposal from expansion joints			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		L 21	
Labourers			
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
Brooms	Work in Progress		
Spades		N/A	
Steel rods			
Wheel Barrows	Cones		
<b>Work Method</b>			
1. Identify the expansion joint containing aggregates, sand, silt and debris.			
2. Clean the joint			
3. Remove aggregates, sand, silt and debris and dispose.			
<b>Special Considerations</b>			
Material removed shall be disposed at least 10m from the centreline of the road or as directed by the Engineer			
Bridges in urban centres to be given consideration for disposal.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		20m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 25	Priority	Activity Type	Road Type
Bridge drain pipe cleaning	1	Routine	Paved and Gravel
<b>Work Definition</b>			
Clean all aggregates, sand, silt and debris including disposal from drain pipes			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		L 22	
Labourers			
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
Brooms			
Spades	Work in Progress		
Wheel Barrows	Cones	N/A	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify the drain pipes containing aggregates, sand, silt and debris.</li> <li>2. Clean the pipes</li> <li>3. Remove aggregates, sand, silt and debris and dispose.</li> </ol>			
<b>Special Considerations</b>			
Material removed shall be disposed at least 10m from the centreline of the road or as directed by the Engineer			
Bridges in urban centres to be given consideration for disposal.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Number		30 pcs/day/person	

## 3.2 Manual Maintenance Performance Specifications

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. M 101	Priority	Activity Type	Road Type
Weeding of gravel carriageways and shoulders	1	Routine	Paved and Gravel
<b>Work Definition</b> Where directed by the Employer all grass and other vegetation occurring within the gravel carriageway or gravel shoulder shall be uprooted by pulling up each individual plant or shoot.			
<b>Labour</b>  Work Supervisor  Foreman  Labourers		<b>Standard/Specifications</b>  Manual Maintenance Specification M101	
<b>Tools</b>  Spades/shovels Hoes Rakes	<b>Traffic Signs</b>  Work in Progress	<b>Material</b>  N/A	
<b>Work Method</b> 1. Determine the scope of work 2. Institute safety measures 3. Weed the carriageway and shoulders 4. Dispose of the obstruction 5. Remove the safety signs to open the road			
<b>Special Considerations</b> All the arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way. If the aforesaid weeding disturbs the surface of the carriageway or shoulder then the surface shall be watered and recompacted.			
<b>Method of Measurement</b> Lump sum		<b>Average Daily Production</b> N/A	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. M102	Priority	Activity Type	Road Type
Grass cutting and bush clearing	2	Routine	Paved/Gravel
<b>Work Definition</b>			
Cut grass and other vegetation to specified level			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Labourers		Manual Maintenance Specification M102	
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
Slashers Sickles File Panga		N/A	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify where grass is more than 75 mm high.</li> <li>2. Cut grass to a width of 3m from the side ditch.</li> <li>3. Clean the cut area of debris</li> </ol>			
<b>Special Considerations</b>			
<p>All grass and other vegetation within a width of 10 metres from the road centreline or 1 metre beyond the limits of the side drains or earthworks or structures, whichever is the greater shall be cut such that it is maintained at a height not greater than 75 mm above the in-situ ground level, and all the cutting shall be suitably disposed off at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way.</p> <p>All vegetation within a width of 3 metres beyond the limits of the side drains or earthworks or structures, whichever is the greater shall be cut such that it is maintained at a height not greater than 500 mm above the in-situ ground level, excepting only throughout the inside of horizontal curves with radii of less than 500 metres in which case the aforesaid vegetation control shall be extended to 10 metres beyond the limits of the side drains or earthworks or structures, whichever is the greater and all the cuttings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way.</p>			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		1000m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. M103	Priority	Activity Type	Road Type
Removal of deposits on the carriageway and shoulders	2	Routine	Paved/Gravel
<b>Work Definition</b>			
All extraneous deposits on the carriageway and shoulders and all associated vegetation therein occurring above the original as-built formation level shall be removed.			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Labourers		Manual Maintenance Specification M103	
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
Slashers Sickles File Panga	Work in Progress  Go slow  Red/Green Flags	N/A	
<b>Work Method</b>			
1. Identify area where deposit or vegetation occurs. 2. Remove deposits and vegetation. 3. Clean the cut area of debris			
<b>Special Considerations</b>			
Notwithstanding the vegetation control specified separately, all extraneous deposits on the carriageway and shoulders and all associated vegetation therein occurring above the original as-built formation level shall be removed without disturbing the remaining formation which shall thereby be reinstated to its' original level and cross fall, and all cleared spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		1000m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. M 104  Removal of obstructions from the carriageway, shoulders and drainage	Priority  1	Activity Type  Routine	Road Type  Paved and Gravel
Work Definition All extraneous items to obstruct the free flow of traffic or drainage water shall be removed and disposed			
Labour  Work Supervisor Foreman Labourers		Standard/Specifications  Manual Maintenance Specification M 104	
Tools  Claw Bars Shovels Matches Hoes Rakes Pick axes Axes Ropes Wheel Barrows Timber Planks	Traffic Signs  Work in Progress  Go slow  Red/Green Flags  Cones  Diversion	Material    N/A	
Work Method 1. Determine the scope of work 2. Institute safety measures 3. Dispose of the obstruction 4. Remove the safety signs to open the road			
Special Considerations Notwithstanding the removal of deposits specified separately, all extraneous items which form or threaten to form an obstruction to the free flow of traffic or drainage of water shall be removed without disturbing the remaining formation; and all arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way. Where such obstructions comprise carcasses of dead animals, each carcass shall be disposed off by burial in a 1 metre deep pit.			
Method of Measurement Lump sum		Average Daily Production N/A	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. 105	Priority	Activity Type	Road Type
Culvert cleaning	1	Routine	Paved and Gravel
<b>Work Definition</b>			
All debris, deposits and vegetation shall be removed from culverts including inlets, outlets and outflow channels			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor, contractors		Manual Maintenance Specification M 105	
- Headman			
- Labourer			
<b>Tools</b>	<b>Traffic Signs</b>	<b>Materials</b>	
Torch, spirit level Long scoops Shovel Wheel Barrows Hoe Rake Panga Slasher	Road Cones	N/A	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify culvert for cleaning outlets according to diameter.</li> <li>2. Remove/Excavate all debris and silt up to invert levels. Set out and clear down at outlet.</li> <li>3. Clear inlet, vegetation, soil to specified fall to a maximum distance of 20m.</li> <li>4. Dispose</li> </ol>			
<b>Special Considerations</b>			
All debris, deposits and vegetation shall be suitably removed from within the culverts and their inlets and outlets such that they remain clean and free flowing at all times, and all cleared spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/ private property in any way.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Unit: Linear metres (Measured length of Culverts)		- Full silted – 4m/day/person - Half silted – 8m/day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. 106	Priority	Activity Type	Road Type
Cleaning of streams, channels and other water courses	1	Routine	Paved and Gravel
<b>Work Definition</b>			
All debris, deposits and vegetation shall be removed from streams, channels and other water courses			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor, contractors		Manual Maintenance Specification M 106	
- Headman - Labourer			
<b>Tools</b>	<b>Traffic Signs</b>	<b>Materials</b>	
Torch, spirit level Long scoops Shovel Wheel Barrows Hoe Rake Panga Slasher	Road Cones	N/A	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify streams, channels or other water courses for cleaning.</li> <li>2. Remove/Excavate all debris and vegetation.</li> <li>3. Dispose</li> </ol>			
<b>Special Considerations</b>			
All debris, deposits and vegetation shall be suitably removed from within the streams, channels and other water courses such that they remain clean and free flowing at all times, and all cleared spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/private property in any way.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Unit: Linear metres (Measured length of Culverts)		- Full silted – 4m/day/person - Half silted – 8m/day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. M 107	Priority	Activity Type	Road Type
Clean side drains	1	Routine	Paved and Gravel
<b>Work Definition</b>			
All debris and vegetation shall be removed from side drains			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		Manual Maintenance Specification M 107	
Labourers			
<b>Tools</b>	<b>Traffic Signs</b> Work in Progress	<b>Materials</b>	
Spades Hoes Pick axes Templates Wheel Barrows	Cones	N/A	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify sections of the side drains containing (silt, vegetation, debris and ponded waters).</li> <li>2. Drain off ponded water from the side drains</li> <li>3. Remove silt, vegetation or debris and dispose.</li> <li>4. Shape side drains to required dimensions.</li> </ol>			
<b>Special Considerations</b>			
All debris and vegetation shall be suitably removed from within the side-drains such that the design cross-section and longitudinal profile are retained or where the design of this is not known the side drain shall be maintained at a depth of 0,5 m below the adjacent road shoulder level and to a width of 0,5 m at the invert with side slopes of 1 in 1.5 with a fall to the nearest outlet point, such that the side-drain is maintained clean and free flowing at all times; an all cleared spoils and other arisings shall be suitably deposited of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Linear metres		Fully silted 30m/day/person Half silted 50m/day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. M 108	Priority	Activity Type	Road Type
Cleaning of off shoots	1	Routine	Paved and Gravel
<b>Work Definition</b>			
All debris and vegetation shall be removed from off shoot channels			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		Manual Maintenance Specification M 108	
Labourers			
<b>Tools</b>	<b>Traffic Signs</b>	<b>Materials</b>	
Spades Hoes Pick axes Templates Wheel Barrows	Work in Progress  Cones	N/A	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>5. Identify sections of the off shoots containing (silt, vegetation, debris and ponded waters).</li> <li>6. Drain off ponded water from the off shoots</li> <li>7. Remove silt, vegetation or debris and dispose.</li> <li>8. Shape side drains to required dimensions.</li> </ol>			
<b>Special Considerations</b>			
All debris and vegetation shall be suitably removed from within the offshoot channels such that they remain clean and free flowing at all times, and all cleared spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation, pavement or structures or adjacent public or private property in any way and all to the satisfaction of the Employer.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Linear metres		Fully silted 30m/day/person Half silted 50m/day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. M 109	Priority	Activity Type	Road Type
Earthworks erosion repair	1	Routine	Paved and Gravel
<b>Work Definition</b>			
All potholes, ruts, runnels, scour points, washouts or other erosion damages shall be repaired			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		Manual Maintenance Specification M 109	
Labourers			
<b>Tools</b>	<b>Traffic signs</b>	<b>Material</b>	
Hoes Spades Rammers	Work in Progress  Cones	- Mineral aggregates	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify damaged sections.</li> <li>2. Remove loose material, trim to shape.</li> <li>3. Fill with suitable materials to the required shape and compact (construct to fall)</li> </ol>			
<b>Special Considerations</b>			
All earthworks potholes, ruts, runnels, scour points, washouts or other erosion damage occurring in the carriageway, shoulders, drainage or formation extending to 1 metre beyond the limits of earthworks shall be repaired. The repair to include the removal of loose or deleterious material from within the indentions, the trimming of the indentation back to sound material to render it suitably trimmed and shaped to act as a key to fill material, together with the provision and placing of suitably selected gravel wearing course material and watering and compaction of the fill and subsequent surface trimming to adjacent surface level. The selected fill is to be provided from approved borrow pits, and all cleared spoil and other arisings shall be suitable disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/private property in any way.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		30m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. M 110	Priority	Activity Type	Road Type
Headwall, wingwall and scour control repairs	1	Routine	Paved and Gravel
<b>Work Definition</b>			
All damaged or deteriorated headwall, wingwalls and scour controls shall be repaired			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		Manual Maintenance Specification M 110	
Labourers			
<b>Tools</b>	Traffic signs	<b>Material</b>	
Hoes Spades Rammers	Work in Progress Cones	- Mineral aggregates	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify damaged sections.</li> <li>2. Remove loose material, trim to shape.</li> <li>3. Fill with suitable materials to the required shape and compact (construct to fall)</li> </ol>			
<b>Special Considerations</b>			
<p>All damaged or deteriorated headwalls, wingwalls or scour controls shall be reported to the Employer and shall subsequently be repaired at the direction and to the satisfaction of the Employer, using materials supplied by the Employer, and all spoil or other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/private property in any way.</p> <p>The aforesaid reinstatement shall conform to the original as-built design and standard unless specifically directed otherwise by the Employer, although scour controls shall normally be reinstated at intervals of 5 metres where the drainage gradient exceeds 10%, at 10 metre intervals for gradients of 8-10%, and at 20 metre intervals for gradients of 6-8 %.</p>			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m2		30m2/day/person	

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>			
Maintenance Activity No. M 111	Priority	Activity Type	Road Type
Painting of guardrails and headwalls	1	Routine	Gravel and Paved
<b>Work Definition</b>			
All guardrails, headwalls or other roadside furniture and structures shall be painted			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		Manual Maintenance Specification M 110	
Labourers			
<b>Tools</b>	<b>Traffic signs</b>	<b>Material</b>	
Hoes Spades Rammers	Work in Progress  Cones	- Mineral aggregates	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify damaged sections.</li> <li>2. Remove loose material, trim to shape.</li> <li>3. Fill with suitable materials to the required shape and compact (construct to fall)</li> </ol>			
<b>Special Considerations</b>			
<p>All damaged or deteriorated headwalls, wingwalls or scour controls shall be reported to the Employer and shall subsequently be repaired at the direction and to the satisfaction of the Employer, using materials supplied by the Employer, and all spoil or other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public/private property in any way.</p> <p>The aforesaid reinstatement shall conform to the original as-built design and standard unless specifically directed otherwise by the Employer, although scour controls shall normally be reinstated at intervals of 5 metres where the drainage gradient exceeds 10%, at 10 metre intervals for gradients of 8-10%, and at 20 metre intervals for gradients of 6-8 %.</p>			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m <sup>2</sup>		30m <sup>2</sup> /day/person	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity No. M 111	Priority	Activity Type	Road Type
Painting of guardrails and headwalls	1	Routine	Gravel and Paved
<b>Work Definition</b>			
All guardrails, headwalls or other roadside furniture and structures shall be painted			
<b>Manpower</b>		<b>Standard/Specifications</b>	
Work Supervisor		Manual Maintenance Specification M 111	
Labourers			
<b>Tools</b>	<b>Traffic signs</b>	<b>Material</b>	
Hoes Spades Rammers	Work in Progress  Cones	- Paint	
<b>Work Method</b>			
<ol style="list-style-type: none"> <li>1. Identify damaged sections.</li> <li>2. Clean damaged area and remove loose material.</li> <li>3. Repaint according to manufacturer's guidelines</li> </ol>			
<b>Special Considerations</b>			
All guard-rails, headwalls or other roadside furniture and structures in need of painting shall be reported and subsequently shall be painted at the direction of and to the satisfaction of the Employer, using materials supplied by the Employer; and all surplus materials, spoil and other arisings shall be suitably disposed of at least 25 metres distant from the road centreline; all without damaging the road formation pavement or structures or adjacent public or private property in any way.			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Square metres/m2		30m2/day/person	

## 3.3 Mechanical Maintenance Performance Specifications

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION		
Maintenance Activity	Activity Type	Road Type
Mechanical ditch cleaning/reinstatement	Routine	Paved & Gravel
Work Definition		
The cleaning/reinstatement of roadside ditches, using a grader to restore free flowing drainage ditches and channels to their original profile and cross section.		
Labour	Equipment	
Foreman Civil 1	Grader 1	
Operator Heavy 1	Motorcycle 1	
Headmen 1		
Porter 10		
Tools	Traffic Signs	Material
Shovel 7	Work in Progress 2	None
Hoes 4	Red flag 2	
Work Method		
<ol style="list-style-type: none"> <li>1. Define work area using signs and safety devices.</li> <li>2. Use grader to pull material from ditch and dispose of arisings. This may require 2 or 3 passes.</li> <li>3. Shape edge of ditch to provide smooth transition from shoulder to front shape of ditch.</li> <li>4. Labour to provide final trimming of the works and to dispose off excess material and organize jettisoning it beyond ditch line.</li> <li>5. Remove signs and safety devices.</li> </ol>		
Special Considerations		
Method of Measurement		Average Daily Production
Unit: Lm (Linear metres) of ditches and channels cleaned but also record the length of the road section for which drainage is here by reinstated in linear metres.		1,000 linear metres of ditch cleaning.

## Road Maintenance Specifications

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>		
Maintenance Activity Shoulder repair	Activity Type Routine	Road Type Paved
<b>Work Definition</b>  The addition of selected gravel to isolated areas of shoulder where low spots have developed/grading of shoulders		
<b>Labour</b> Foreman Civil ..... 1 Headmen ..... 1 Operator Heavy ..... 3 Operator Light..... 1 Driver Heavy ..... 2 Driver Light ..... 1 Site Clerk ..... 1 Mechanic ..... 2 Labourer ..... 5		<b>Equipment</b> Pick up..... 1 Tippers.....2 Water Bowser ..... 1 Motorcycle ..... 1 Traxcavator..... 1 Grader ..... 1 Roller PTR or Vib. Drum..... 1 Water Pump
<b>Tools</b> Shovels 6 Hard Brooms 4 Camber boards level 1	<b>Traffic Signs</b> Work in Progress 2 Red flag 2	<b>Material</b> Selected gravel 135m3
<b>Work Method</b>  1. Define work area and set up safety signs, flags etc. 2. Grade shoulder to restore even cross-section, lightly scarify and water. 3. Haul and place selected gravel. 4. Spread and shape gravel to approximate level and cross fall. 5. Water and compact, rolling from outer edge inwards. 6. Skim shoulder to edge of pavement level and correct 4-6 cross fall, by grader. 7. Lightly water and complete compaction, rolling from the outer edge inwards. 8. Brush/clean pavement edge. 9. Clear drainage from side drain and jettison well clear of ditch. 10. Remove safety signs and devices.		
<b>Special Considerations</b> 1. Special care has to be taken (i) to avoid damaging the pavement edge and (ii) to avoid grading off the shoulder at too great across fall, so it is important to use a camber board to maintain a cross fall of 4-6% (but not on superelevated sections of curve where the superelevation cross fall will govern). 2. When cleaning the ditch, it is important to ensure the spoil is disposed of well clear of the edge of ditch so that (i) the spoil does not get washed back into the ditch with rainwater run-off and (ii) it does not form a berm, which will obstruct rainwater run-off entering the ditch.		
<b>Method of Measurement</b>  Unit: Square metre (m2) Measure the cumulative lengths of work done.		<b>Average Daily Production</b>  5000 square metre of shoulder spot recharging.

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION			
Maintenance Activity	Activity Type	Road Type	
Emergency Repair/Spot Regravelling	Emergency	Gravel	
<b>Work Definition</b>			
To effect emergency spot repairs to any failed section of gravel road.			
<b>Labour</b>		<b>Equipment</b>	
Foreman Civi .....	1	Pick up.....	1
Headmen .....	2	Tippers.....	2
Operator Heavy .....	3	Water Bowser .....	1
Operator Light.....	2	Motorcycle .....	1
Driver Heavy.....	4	Traxcavator.....	1
Drive Light .....	1	Grader .....	1
Mechanic .....	2	Roller PTR or Vib. Drum.....	1
Porter.....	10	Water Pump	
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>	
Pick axe 4	Work in Progress 2	Selected gravel	135m3
Shovel 6	Red flag 2		
Wheel barrow 2			
Hand rammer 2			
Camber boards level 1			
<b>Work Method</b>			
(Note: Emergency repairs cannot be universally defined or quantified but it is assumed sections of road which have collapsed will primarily required spot regravelling and side drainage works)			
1. Define work area and set up safety warning signs etc.			
2. Identify source of selected gravel and commence hauling to work site.			
3. Prepare formation to receive gravel overlay; scarify, water and compact as necessary.			
4. Place, spread and mix 150mm thick layer of gravel over full width of formation, water and compact.			
5. Continue construction of additional gravel layer(s) up to finished level and final crossfall.			
6. Reinstate side drains, offshoots and channels.			
7. Remove safety signs.			
<b>Special Considerations</b>			
1. The repair should reinstate the road and remedy the cause of failure. 2. The above mechanized unit is intended primarily for spot regravelling of failed sections of road and reinstatement of side drainage. However, in the event culvert replacement is required then that specialized unit will also have to be deployed			
<b>Method of Measurement</b>		<b>Average Daily Production</b>	
Unit: Cubic Metre (m3) Measure length, width and thickness of fill placed and compacted.		120 cu.m (0.25km)	

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION		
Maintenance Activity Culvert replacement	Activity Type Routine	Road Type Paved & Gravel
Work Definition The replacement of collapsed or damaged culverts (including masonry headwalls) to reinstate effective drainage.		
Labour Foreman Civil ..... 1 Headmen ..... 1 Operator Heavy ..... 1 Operator Light..... 2 Driver Heavy ..... 1 Site clerk..... 1 Skilled Labourer (Mason Carpenter) ..... 1		Equipment Truck flat bed..... 1 Backhoe..... 1 Hand Vib. plate/roller.....2 Water trailer 1200lt ..... 1 Water pump ..... 1 Tract. air compressor..... 1
Tools Shovel            2	Red Flag        2	Traffic Signs Diversion/Safety Barriers, Road works ahead Work in progress
Work Method  <ol style="list-style-type: none"> <li>1. Determine culvert diameter, dependant on flow and minimum cover.</li> <li>2. Determine length of culvert required, dependant on angle of slew, depth and cross-section of formation.</li> <li>3. Define work area with safety signs and flags.</li> <li>4. Close half road width at a time.</li> <li>5. Set out works, with profile boards to correct invert level and gradient.</li> <li>6. Break out asphalt pavement and stabilized base course over width of excavation.</li> <li>7. Excavate, allowing 600mm for side cover and 150mm for bedding.</li> <li>8. Remove old culvert and headwalls.</li> <li>9. Hand trim excavation.</li> <li>10. Place bedding, water and compact.</li> <li>11. Lay pipe culvert(s) to a uniform gradient and alignment.</li> <li>12. Restrain pipe culvert against lateral movement and floatation during backfilling.</li> <li>13. Carefully place initial backfill material in excavation and work it under and around pipe. Water and compact in 150mm layers.</li> <li>14. Transfer safety barriers to other lane, repeat steps 4-13.</li> <li>15. Prepare culvert ends for headwall construction and construct, ensuring headwall is taken down to 300mm below invert level and finished flush with shoulder level.</li> </ol>		
Special Considerations  <ol style="list-style-type: none"> <li>1. Absolute minimum cover for corrugated steel pipes is 300mm i.e. 450mm below finished gravel surface level for gravel roads and at and 300mm below to of base course for paved roads, measured at the critical point – which is at the edge of shoulder and never at the road centre line.</li> <li>2. The culvert pipe will be displaced it backfill is tipped directly into the excavation. Backfill material should be tripped alongside the excavation and progressively placed and spread by hand.</li> <li>3. Flotation of the pipe will occur during the backfill operation unless the pipe is restrained against upward displacement. This is usually achieved by use of structural timber over the pipe, with the pipe wedged against the timbers and the timber anchored to the road bed.</li> </ol>		
Method of Measurement  Unit: Linear metre (m) Measure length of each culvert run in meters for each culvert diameter		Average Daily Production  5 linear metres of culvert replaced

<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>		
Maintenance Activity Premix pothole patching	□ Activity Type Routine	Road Type Paved
<b>Work Definition</b> Patching of potholes in the pavement surface with a premix bitumen mixture, using a mobile mixing plant.		
<b>Labour</b>		<b>Equipment</b>
Foreman ..... 1		Pick up..... 1
Operator Light..... 3		Tippers..... 2
Driver Light ..... 1		Motorcycle ..... 1
Headmen ..... 3		Premix Plant ..... 1
Porters ..... 15		Hand vibrator plate/roller ..... 2
		Backhoe..... 1
<b>Tools</b>	<b>Traffic Signs</b>	<b>Material</b>
Bucket 2	Work in Progress 2	Bitumen 80/100
Wheelbarrow 2	Red flag 2	Prime coat bitumen Mc70
Shovel 6		Aggregate 20mm down
Pick axe 3		Aggregate 15mm down
Asphalt rake 2		Aggregate crusher dust
Asphalt broom 2		Marking paint
Hand rammer 2		
<b>Work Method</b>		
<ol style="list-style-type: none"> <li>1. Define work area and set up safety signs etc.</li> <li>2. Mark out the limits of each pothole repair with paint, to a rectangular shape.</li> <li>3. Excavate the area to be repaired, taking care to use the pick axe to always chop towards the centre of the pothole, to avoid levelling the old bituminous surface which causes the outward propagation of surface cracks. The excavation should continue until soil material is encountered on all excavated faces.</li> <li>4. Trim and clean the excavated area, ensuring the side walls are chopped out vertical and all loose material is removed from the excavation and brushed clean of dust.</li> <li>5. Slightly dampen all the excavated surface to stabilize any remaining dust particles.</li> <li>6. Apply bituminous prime coat to all excavated surface and allow time for penetration (approx. 30 minutes)</li> <li>7. Place premix and compact in layers of 75mm (3 inches) max thickness, ensuring extra compaction at the edges of the pothole. Prior to final rolling shape surface to ensure a domed final profile is achieved at final compaction.</li> <li>8. Blind surface with crusher dust.</li> <li>9. Remove surplus arisinigs and loose aggregates and dispose of these, clear of the road and drainage.</li> <li>10. Clean tools and equipment.</li> <li>11. Remove safety signs.</li> </ol>		
<b>Special Considerations</b>		
<ol style="list-style-type: none"> <li>1. This is a dry weather activity only, requiring a dry road bed and dry material for the premix. 2. Open excavated potholes are a severe traffic hazard, particularly at night. The excavation of potholes should, therefore, be limited to the potholes which can be patched within the day. Any surplus heaps of premix also represent major traffic hazards and in addition, are difficult to remove ones hardened – so they should be properly disposed off clear of the road. Similarly, all excavated material must be disposed off clear of the road. 3. The domes surface of the finished pothole is (i) to allow for further compaction of the premix under traffic and (ii) to ensure the pothole never becomes a low point which held water and trigger renewed failure.</li> </ol>		

<p>Method of Measurement Unit: Square metres (m<sup>2</sup>) Measure the length and width of each pothole to determine the total area of patching completed in the day.</p>	<p>Average Daily Production 15 square metres of concentrated works. (Note: production will be reduced for scattered pothole patching)</p>
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<b>REPUBLIC OF UGANDA</b> <b>MINISTRY OF WORKS AND TRANSPORT</b> <b>WORK PERFORMANCE SPECIFICATION</b>		
Heavy grading (incorporating a spot regravelling element)	Activity Type Routine	Road Type Gravel
<b>Work Definition</b>		
<p>Pure heavy grading is the reshaping and recompaction of the formation, after recovering displaced material from the drainage ditches and shoulders; which is scarified and watered, prior to shaping and compaction. And in this instance, given the MOWT's existing equipment, it is proposed to combine the heavy grading activity with a spot regravelling element, for provision of additional selected material from borrow pits.</p>		
<b>Labour</b> Foreman Civil ..... 1 Headmen ..... 1 Operator Heavy ..... 3 Operator Light..... 1 Driver Heavy ..... 2 Driver Light ..... 1 Mechanic ..... 2 Porters ..... 10		<b>Equipment</b> Tippers.....2 Water Bowser ..... 1 Water pump ..... 1 Motorcycle ..... 1 Traxcavator..... 1 Grader ..... 2 Roller vibro double drum ..... 1 Pick up..... 1
<b>Tools</b> Spades           6 Rakes            6 Camber borads level 1	<b>Traffic Signs</b> Work in progress 2 Red flag           2 Stop/Go board    2	<b>Material</b> Selected gravel
<b>Work Method</b>		
<ol style="list-style-type: none"> <li>1. Define work area and set up safety signs, flags etc.</li> <li>2. Use grader to clean/reinststate side drains, drawing arisings onto the shoulders.</li> <li>3. Use graders to spread ditch arisings over the width of formation, and simultaneously grade formation to approximate final cross-section profile.</li> <li>4. Remove organic material from arisings and dispose, using labour.</li> <li>5. Identify locations lacking sufficient gravel, deliver and spread additional selected gravel from borrow.</li> <li>6. Scarify formation over full width.</li> <li>7. Grader mix loose material and shape to correct 5% crossfalls.</li> <li>8. Water and compact, rolling from the edge of formation towards the centre.</li> <li>9. Clean side drains of construction rubble, by labour.</li> <li>10. Remove safety signs.</li> </ol>		
<b>Special Considerations</b>		
<p>This operation requires continuous traffic control both for (i) safety during working and (ii) to ensure that trafficking during the impaction phase is evenly distributed, avoids rutting and assists with compaction. 2. It is also important to actively use the camber board to ensure crossfalls of 5% are maintained through the reconstruction phase and not simply as a final check.</p>		
<b>Method of Measurement</b>		<b>Average Daily Production</b>
Unit: Square metre (m2) Measure total length of road way heavy graded.		2500 square metres

<b>REPUBLIC OF UGANDA</b> MINISTRY OF WORKS AND TRANSPORT WORK PERFORMANCE SPECIFICATION		
Maintenance Activity	Activity Type	Road Type
Medium/Light grading	Routine	Gravel
<b>Work Definition</b>		
The routine light grading of gravel roads to provide a smooth riding surface and to arrest the development of ruts and corrugations, by evening-out surface irregularities.		
<b>Labour</b>		<b>Equipment</b>
Foreman Civil .....	1	Grader .....
Operator Heavy .....	1	Motorcycle .....
Porters .....	2	
<b>Tools</b>	<b>Safety Signs</b>	<b>Traffic Signs</b>
Shovel	2	Work in progress <sup>2</sup> No.
Red Flag	2	Red flag 2 No.
		Stop/Go board 2 No.
<b>Work Method</b>		
<ol style="list-style-type: none"> <li>1. Define work area using signs and safety devices as required.</li> <li>2. Grade shoulder to re-establish crossfall to ditch or run-off point.</li> <li>3. Grade adjacent traffic lane to re-establish crossfall to shoulder and ditch.</li> <li>4. Repeat steps 3 and 4 for the other traffic lane and shoulder.</li> <li>5. Labour (i) to dispose off any excess loose material or oversize remaining on the carriageway (ii) to hand trim shoulder/ditch interfere passage of rainwater run-off to ditch and (iii) to dispose off any vegetation drawn in to the workings by the grading operations.</li> </ol>		
<b>Special Considerations</b>		
<ol style="list-style-type: none"> <li>1. As always, the angle of grader blade should be set to draw graded material towards the centre of the road and never outwards.</li> <li>2. There may be localized sections which require medium grading to ensure rainwater runoff. Such spot treatment should be carried out at the direction of the foreman – and should be measured separately.</li> </ol>		
<b>Method of Measurement</b>		<b>Average Daily Production</b>
Unit: Squarer metre (m <sup>2</sup> ) of road graded. Measure length of road light graded		12000 square metres per day.

