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DIVISION 10 ROUTINE MAINTENANCE WORKS

SECTION 10.1 ROUTINE MAINTENANCE OF PAVEMENT, SHOULDER, DRAINAGE, ROAD FURNITURE AND BRIDGES

10.1.1 GENERAL

10.1.1.1 Description

The work covered by this Section shall comprise routine maintenance works to ensure that the pavement, shoulders, drainage, road furniture and bridges are maintained at all times in a serviceable condition to the satisfaction of the Engineer. The work shall be paid for in monthly installments from the lump sums bid for the various elements of work as specified in Article 10.1.7 of these Specifications.

The routine maintenance work is required to be commenced at the time of the Commencement Date until the issue of Taking Over Certificate.

The routine maintenance works carried out and paid for under this Section to maintain the works in a serviceable condition must be carefully differentiated by the Engineer by the larger-scale works which are carried out to either reinstate or improve the condition of the works and which are paid for under various other Sections of these Specifications.

As payment is made on a lump sum basis rather than on the basis of actual material quantities used, the Contractor shall be deemed to have inspected the site carefully during the Bid Period and satisfied himself that his price covers the works which will be needed during the **Time for Completion**, taking account of traffic volumes, residual strength of the existing pavement, weather conditions and the likely pavement deterioration between the time of bidding and the time of site handover to the Contractor.

10.1.1.2 Classification of Routine Maintenance Work

Generally, the differentiation of works classified as routine maintenance and works classified as either improvement or reinstatement works for pavement, shoulders, drainage, road furniture and bridges will be as specified hereinafter unless directed otherwise by the Engineer.

(a) Pavements

(i) Sealed Pavement

Routine maintenance works shall include operations aimed chiefly at maintaining a riding surface of a smoothness consistent with that typical for average quality surfacing of the type already existing on the road such as crack sealing, small pothole filling and small digouts not classified as Reinstatement Work.

The reinstatement of large potholes or patches exceeding 40 cm X 40 cm, failed edges, fine crack affecting more than 10 % of any 100 m length, wide crack requiring individual sealing, alligator type cracking deemed by the Engineer to be structural and which are therefor to be excavated and patched, and works aimed at improving the surface cross fall, shape or structural

strength of the pavement shall not be considered part of the routine maintenance works and shall be measured and paid for under the relevant Sections of these Specifications for the materials used, such as Hot Asphalt Mixtures, and so on.

(ii) Unsealed Pavement

Routine maintenance works shall include operations such as the filling of pot holes and corrugations, and light grading to redistribute loose material.

The reinstatement of severely rutted or broken section of unsealed road by re-gravelling in addition to grading shall not be included under routine maintenance. Such improvement works shall be measured and paid for according to the quantity of material used under Sections 5.2 and 8.1 of these Specifications.

(b) Shoulder

Routine maintenance work shall include operations such as pothole filling, the removal of weeds, unwanted trees with trunks of diameter less than 15 cm at a point measured one metre above the ground surface and other obstructions, and regrading.

Major shoulder improvement work involving re-gravelling or excavation and re-gravelling or the sealing of shoulder shall not be included under routine maintenance. Such shoulder improvement work shall be measured and paid for under the relevant Sections of these Specifications for the materials used, such as Aggregate Base Class B, Bituminous Surface Treatment and so on.

(c) Drainage

Routine maintenance works shall include operations such as the removal of silt, leaves, debris and vegetation from drains and culverts.

The reinstatement of Mortared Stonework or other drain linings or culverts and drainage improvement works such as the excavation of new ditches, the enlargement, regrading, realignment or lining of existing drains and ditches, or the replacement or extension or new construction of drainage, structures such as culverts, catch pits, etc, shall not be included under routine maintenance. Such drainage improvement works shall be paid for under the relevant other Sections of these Specifications such as Mortared Stonework, Reinforced Concrete Pipe Culvert, Concrete Work, etc.

(d) Road Furniture

Routine maintenance works shall include operations such as the cleaning and repair of damaged signs, guide posts and kilometre posts, the repair of guardrail and the repainting of illegible wording on signs.

The provision of new signs, guide posts, kilometre posts or guard rail either in new locations or for the replacement of damaged sections or the painting of road markings shall be considered road furniture reinstatement works and shall be paid for separately under Section 8.4 of these Specifications.

(e) Bridges

Routine maintenance works shall include operations such as regular inspections and reporting on the condition of all major component of the Structure as well as the cleaning of drainage channels and ports, the cleaning of dirt and debris from expansion joints, bearings and other metal components susceptible to corrosion and the removal of any accumulated flood debris from the waterway.

The repair, reinstatement and replacement of damaged concrete, steel or timber components of the bridge structure, the repainting of structural or miscellaneous steel or timber works, the replacement of structural decking materials and the repair and reinstatement of any damaged road surfacing shall not be included in routine maintenance works for bridges. Such reinstatement or improvement works shall be paid for under other relevant Sections of these Specifications.

10.1.1.3 Related Work Specified Elsewhere

- | | | |
|-----|---|----------------|
| (a) | Traffic Management and Safety | : Section 1.8 |
| (b) | Field Engineering | : Section 1.9 |
| (c) | Cleaning | : Section 1.16 |
| (d) | Environmental Safeguards | : Section 1.17 |
| (e) | Reinstatement of Existing Pavement | : Section 8.1 |
| (f) | Reinstatement of Existing Shoulders on Sealed Roads | : Section 8.2 |
| (g) | Landscaping | : Section 8.3 |
| (h) | Reinstatement of Existing Bridge Structures | : Section 8.5 |
| (i) | Maintenance of Adjacent Roads and Bridges | : Section 10.2 |

10.1.2 ROUTINE MAINTENANCE OF PAVEMENT

10.1.2.1 Location of Areas Requiring Routine Maintenance

Areas of pavement requiring routine maintenance shall be designated by the Engineer, who will determine the areas by visual inspection.

The method and extent of corrective work shall be as instructed by the Engineer in writing who shall also specify a reasonable time for completion.

10.1.2.2 Sealed Pavement

(a) Description

- (i) The routine maintenance of sealed pavements shall comprise surface sealing of cracked areas (BURAS) not exceeding 10 % of any 100 m length, filling and patching of small potholes (excavation and reinstatement) each not exceeding 40 cm X 40 cm. All sections of pavement which are considered by the Engineer to be structurally unsound shall be excavated and reinstated.
- (ii) The required standard of work for sealed roads within the Contract will be such that within three months of the Site being handed over to the Contractor, or within such shorter period that the Engineer may direct, the existing pavement shall have no potholes and no unsealed cracks. Thereafter, the Contractor shall maintain all surfaces so that any potholes which develop at any time within the period stated in Article 10.1.1.1 above shall be repaired

within 14 days of their development. Cracks developing in the same period shall be sealed within 1 month of their development.

(b) Materials

(i) Pothole Repairs and Small Patches

Materials used for pothole filling and patching should be the same as or superior to the materials in the surrounding layer being repaired unless otherwise directed by the Engineer. The material used may consist of selected fill material, Class A Aggregate Base (for sealed roads), HRS-Base, HRS-WC, Penetration Macadam, Prime Coat, Tack Coat, Asphaltic Concrete, Asphaltic Cold Mix, Lasbutag or Latasbusir or any other pavement construction material, according to the pavement layer being repaired. These materials should generally comply with these Specifications or the relevant Technical Specifications, as directed by the Engineer.

(ii) Surface Sealing (on sealed existing pavements)

The materials and construction procedures used for this work shall comply with Section 6.7 of these Specifications.

(c) Execution

(i) Pothole Repairs

All potholes shall be filled. All structurally unsound pavement shall be excavated and refilled. The pothole or patch edges and base shall be cut back to sound material.

The prepared surfaces shall be clean and free of standing water before filling commences.

Each layer shall be filled and compacted in one operation commencing with the lowest layer. Filling and compaction shall be generally in accordance with the relevant specification for the material being used except that hand methods of placing and compaction may be used. Tack Coat shall be applied fully and uniformly to coat all surfaces against which bituminous mixtures are to be placed.

After completion of the patch, a mechanical roller or vibrating plate shall be used to compact the top layer.

(ii) Seal Coating on Existing Sealed Pavement

Isolated areas of permeable or cracked bituminous pavement shall be restored by seal coating using one of the treatments given in the Section 6.7 of these Specifications. The treatment to be used shall be determined by the Engineer.

10.1.2.3 Unsealed Roads

(a) Description

The routine maintenance of unsealed roads shall in general comprise of light grading operations to improve the riding surface of roads that have become lightly potholed and corrugated.

(b) Light Grading

For unsealed roads which are not severely potholed and corrugated, the road surface shall be lightly trimmed with a motor grader on a routine basis, particularly in the dry season, to control roughness and corrugations. When undertaking light grading in the dry season, loose material should be graded towards the edge of the road. In the wet season, material should be graded towards the centre of the road.

(c) Precautions During Grading Operations

Care shall be taken by the Contractor to prevent the grader from passing down the centre of the road with the blade lowered, as this may result in a flattening of the road camber. Care must also be taken during the cutting operation to avoid blending soft clayey soil from the side drains on to the carriageway.

10.1.2.4 Standard of Routine Pavement Maintenance Work

The Contractor shall, from the time the Site is handed over to him until the end of the Defects Notification Period and both before and after the placing of any new pavement layer under the Contract, provide such routine pavement maintenance work as is necessary to ensure a well drained and serviceable road surface at all times.

To ensure that the standard of work is adequate, supervisory staff shall make monthly visual inspections of the road surface and shall inform the Contractor of any surface defects (potholes, cracks, etc) which need attention.

10.1.3 ROUTINE MAINTENANCE OF SHOULDERS

10.1.3.1 Description

(a) All Shoulders within the site of Works shall be regularly examined throughout the **Time for Completion** by the Contractor for their conformance with the standard of condition required by these Specifications and by the Drawings. Any area of shoulder which is considered in need of routine maintenance in any way shall be reported to the Engineer, who shall then issue appropriate instructions for the type of maintenance action required.

(b) Shoulder shall be considered deficient and the Engineer shall issue appropriate instructions for routine maintenance of them if any of the following conditions are noted:

(i) The shoulder requires regrading to remove small potholes or reshaping to improve smoothness or drainage;

(ii) The shoulder is in need of further compaction to render it serviceable;

- (iii) The shoulder is covered with long grass, shrubs or trees with trunks less than 15 cm in diameter which represent a safety hazard or which obstruct site distance;
- (iv) The shoulder is not free of loose materials, unwanted objects or any other material not related to the road function;
- (v) The shoulder does not require excavation or the removal of material but is in need of further regarding to provide free drainage of water from the sealed pavement to the ditch zone.
- (vi) Shoulder Maintenance Work carried out under the directions of the Engineer to correct any of the above conditions shall be paid for under Article 10.1.7 of these Specifications.

10.1.3.2 Materials and Execution

The quality of materials and the standard of preparation, placement and compaction of any materials under used in the routine maintenance of shoulders shall be in every respect in accordance with the provisions of Section 4.2 of these Specifications.

10.1.4 ROUTINE MAINTENANCE OF DITCHES, DRAINS, CUTTING AND EMBANKMENTS

- 10.1.4.1 Routine maintenance of both temporary and permanent ditches and drains shall be scheduled so that a free flow of water is maintained throughout the whole **Time for Completion**.
- 10.1.4.2 Existing and newly constructed ditches and drains shall be maintained free of all loose material, debris, sediment and undesirable vegetation growth likely to restrict the free flow of surface water run off. Such maintenance shall be carried out on a regular routine basis and directly after surface water run off from heavy rains has subsided.
- 10.1.4.3 During periods of heavy rain the Contractor shall provide a maintenance crew who will patrol the site and note any malfunction of the drainage system caused by blockage or other problems. Any irregularities in the drainage noted at such times, such as overflow, lack of capacity, erosion, improper alignment of drainage structures or other improper design shall be reported to the Engineer who shall issue appropriate instructions regarding the action to be taken.
- 10.1.4.4 Routine maintenance of embankments and cuttings shall include the cutting of grass, shrubs and small tress to improve the road appearance in and adjacent to built up areas or the sight distance or curves. Other work including the repair of unstable slopes, reinstatement or improvement of associated drainage and stabilization by vegetation shall be performed and paid for in accordance with the provisions of Section 8.3 of these Specifications.

10.1.5 ROUTINE MAINTENANCE OF ROAD FURNITURE

- 10.1.5.1 The Contractor shall repaint any signs on which the existing paint has deteriorated and shall repaint the wording on signs where the wording is not clear.

- 10.1.5.2 The Contractor shall also carry out any repairs to damaged road signs, damaged section of guardrail less than 10 m in length in any given case, guide posts, kilometre posts and other road furniture, as directed by the Engineer.

10.1.6 ROUTINE MAINTENANCE OF BRIDGES

10.1.6.1 Description

- (a) Routine maintenance works for bridges shall apply to all bridges within the total length of the Contract, irrespective of the size or type of bridge, and shall principally comprise of regular inspections of the major components of the structure, preparation of detail inspection reports and routine cleaning of areas susceptible to deterioration if left unattended.
- (b) Inspection and cleaning operations for the routine maintenance of bridges shall be carried out at regular intervals throughout the entire period of the Contract. Inspection of the water channel area shall also be made during times of heavy rainfall induced flood and again when the floodwaters have subsided.

10.1.6.2 Inspection and Reporting

(a) **General**

The importance of accurate and regular inspection and reporting for bridge structures can not be overstressed. The service life of bridges will be considerably reduced if items requiring maintenance, either routine or periodic, are not detected during regular inspection activities.

In all types of bridge structure, dampness together with the accumulation of dirt and debris is the major cause of deterioration that can readily be stopped by simple routine maintenance cleaning operations. These conditions particularly occur in the darkest and most inaccessible parts of a bridge, so a thorough check in every crevice is necessary, particularly after flooding.

(b) **Inspection for Minor Design Revision**

Bridge structures will be inspected during the first thirty days of the Mobilization Period as part of the Contractor's field survey of the whole works carried out in accordance with Section 1.9 of these Specifications.

The purpose of this inspection is to identify areas of reinstatement works not detailed on the Drawings in order that the Engineer may refine the quantities and budget required for this work. This inspection is considered part of routine maintenance and the cost of carrying out such an inspection will therefore be covered by the lump sum price for Routine Maintenance for Bridges.

(c) **Routine Inspection**

The regular inspection activities carried out under this Section of the Specifications shall concentrate on the identification of cleaning and clearing operations to be carried out on a routine basis and any additional areas of the structure showing signs of distress as a result of the passage of time or flood action occurring within the Time for Completion.

Where additional defects and deficiencies within the structural components of the bridge are found during the routine inspections, they shall be reported to the Engineer who shall determine what remedial action will be required. The range and type of such remedial works may vary considerably depending on the size, type of construction, type of materials and age of the structure. Such work shall not therefore form part of routine maintenance and when included by the Engineer as part of the scope of this Contract, shall be paid for under Division 8, Reinstatement Works or, where necessary, Division 9, Day work. However, the inspection activity to identify such reinstatement work shall be paid for under this Section of these Specifications.

(d) Inspection during or after Flood Conditions

During heavy rainfall the more important bridges shall be observed to see if there is any tendency for the river to change its course. Any bridges where serious scour and debris build-up is detected shall be reported to the Engineer.

When heavy rainfall induces high flood level, all waterways adjacent to the bridge structure within the site of works shall be checked for scour and erosion directly after flood water levels have subsided. Measurement of the depth of the streambed below deck level around all piers and abutments shall be recorded using steel rods so that the Engineer can check the results against existing drawings or previous records to determine if any unusual changes that warrant additional reinstatement or protection works have occurred.

(e) Reporting

The results of each inspection shall be reported to the Engineer in a format and form acceptable to the Engineer.

10.1.6.3 Execution of Routine Cleaning and Clearing Operations

(a) Waterways

Within the waterway channel the following routine cleaning and clearing operations shall be carried out to the satisfaction of the Engineer :

- (i) any vegetation growth that is obstructing or diverting or is likely to obstruct or divert the river or stream flow shall be removed ;
- (ii) any flood deposited debris such as logs, branches, or other vegetation that may cause flow diversion or scour shall be removed and disposed of tidily above and beyond the reach of any flood flow that the waterway may carry;
- (iii) all debris of any kind that is lodged against the bridge substructure shall be removed and disposed of.

(b) Superstructure and Substructure

Within the bridge superstructure and substructure the following routine cleaning and clearing operations shall be carried out to the satisfaction of the Engineer:

- (i) all overhanging vegetation shall be cleared adequately but not excessively and all lopping tidily disposed of ;

- (ii) all weep hole provided on abutments and wing wall shall be kept free of clogged debris ;
- (iii) all bridge seats and pier caps shall be kept free from debris, dirt and moisture ;
- (iv) all joints in timber surfaces shall be kept free from debris and dirt so that moisture is not retained, thereby accelerating decay ;
- (v) all steel surfaces shall be kept free from debris and dirt so that moisture is not retained, thereby accelerating corrosion ;
- (vi) all scuppers, downspouts, drainage channels and outlets shall be kept clear of debris to allow free discharge of water, thus avoiding spillage onto bearings, bearing seats and seepage through joints and cracks ;
- (vii) no bridge spikes, bolts or broken timbers shall be left projecting above the deck surface to rip the tires of passing vehicles.

10.1.7 MEASUREMENT AND PAYMENT

10.1.7.1 Measurement for Payment

- (a) All work designated by the Engineer as routine maintenance work in accordance with the limits given in Article 10.1.1 of these Specifications, shall be certified for payment each month on the basis of the Engineer's written confirmation that the standard of serviceability of the pavement, shoulders, drainage, road furniture and bridges has been satisfactorily maintained in accordance with the provisions of this Section of these Specifications.
- (b) For areas in which the Engineer has directed that the scope of work is greater than the limits for routine maintenance works define in Article 10.1.1, the works performed will be classified as reinstatement works and will not therefore be paid for under this Section of the Specifications. Measurement and payment for such work shall be made on the basis of the quantities of materials actually used in the work, as provided for under Division 8 of these Specifications.

10.1.7.2 Basis of Payment

- (a) The routine maintenance work described in the foregoing articles shall be paid for from the Contract lump sum prices for the Pay Items listed below and in the Bill of Quantities, which prices shall constitute full compensation to the Contractor for furnishing of all materials, labor equipment, tolls and other incidentals necessary or usual for the routine maintenance of pavements, shoulders, drainage, road furniture and bridges to the satisfaction of the Engineer.
- (b) Subject to the issue each month of the Engineer's written confirmation of satisfactory performance by the Contractor in performing all necessary routine maintenance operations, each lump sum Pay Item shall be paid to the Contractor in the following monthly installments:

$$\text{Months 1 to 3 inclusive} = \frac{\text{Lump Sum}}{8}$$

$$\text{Subsequent Months} = \frac{5 \times \text{Lump Sum}}{8 \times (\text{Time for Completion in Months} - 3)}$$

- (c) If in any month of the **Time for Completion**, the Contractor should fail to carry out to the Engineer’s satisfaction the routine maintenance works described in this Section, the Engineer may issue a written notice to the Contractor and the Contractor is required to respond promptly to such notice. If such written notice has been made twice within a period of one week without any response from the Contractor, the Engineer may opt to perform the work using his own resources or such other resources as he deems necessary.

The additional cost of any such work performed by the Engineer shall be compensated for, by deducting the total cost incurred by the Engineer from the unpaid balance of the lump sums for routine maintenance or from other monies owing to the Contractor.

Pay Item No.	Description	Unit of Measurement
10.1.1	Routine Maintenance of Pavement	Lump Sum
10.1.2	Routine Maintenance of Shoulders	Lump Sum
10.1.3	Routine Maintenance of Ditches, Drains, Cuttings and Embankments	Lump Sum
10.1.4	Routine Maintenance of Road Furniture	Lump Sum
10.1.5	Routine Maintenance of Bridges	Lump Sum

SECTION 10.2

MAINTENANCE OF ADJACENT ROADS AND BRIDGES

10.2.1 GENERAL

10.2.1.1 Description

It is the intent of the Articles in this Section to ensure that during the performance of the Works all existing roads and bridges either adjacent to or leading to the site of the works that are traversed by the Contractor's construction plant and equipment are kept open for traffic and are maintained in a safe and usable condition.

In certain circumstances existing structures may need to be strengthened and temporary bridges and embankments may need to be constructed during the Construction Period to facilitate the transportation of the Contractor's Plant and equipment, to and from the site of works.

10.2.1.2 Related Work Specified Elsewhere

- | | |
|-----------------------------------|--------------------|
| (a) Conditions of Contract | : relevant Clauses |
| (b) Mobilization | : Section 1.2 |
| (c) Transportation and Handling | : Section 1.5 |
| (d) Traffic Management and Safety | : Section 1.8 |
| (e) Cleaning | : Section 1.16 |
| (f) Environmental Safeguards | : Section 1.17 |

10.2.1.3 Submittals

When existing structures are required to be strengthened or temporary bridges and embankments are required to be constructed, the Contractor shall submit a detailed schedule of the temporary works required, details of the proposed execution methodology and the proposed start and finish dates for the strengthening or construction of each structure. The submission of such a temporary works programmed shall be made in conjunction with the submission of such a temporary works programmed shall be made in conjunction with the submission of the Contractor's mobilization schedule submitted in accordance with Section 1.2 of these Specifications.

10.2.2 MAINTENANCE OF ADJACENT ROAD AND BRIDGES USED BY THE CONTRACTOR

Existing public roads and bridges adjacent to the project which are use by the Contractor in the course of his transport and haulage operations in performing the Works, including existing bridges strengthened by the Contractor, temporary bridges constructed by the Contractor and quarry access roads subjected to additional heavy loading as a result of the Contractor's activities, shall be fully maintained by the Contractor at his own expense throughout the duration of the Works and shall be left in a condition of serviceability, quality and amenity such is no worse than before the Contractor's operations were commenced. Temporary bridges constructed by Contractor under this Section of Specification shall not be removed by the Contractor at the completion of the Works unless directed otherwise by the Engineer.

10.2.3 MAINTENANCE FOR TRAFFIC SAFETY

10.2.3.1 Existing Temporary Road Works and Traffic Control

All temporary road works and traffic control installations provided by the Contractor on adjacent or feeder roads to the site of works shall at all times during the **Time for Completion** be maintained in a safe and serviceable condition to the requirements and satisfaction of the Engineer, to ensure the safety of other traffic and of the public using the road. Traffic control provisions shall be in accordance with the requirements of Section 1.8. Maintenance of Traffic Flow.

10.2.4 BASIS OF PAYMENT

No separate payment shall be made for the maintenance of adjacent road and bridges executed in accordance with this Section of the Specifications. The cost of this work shall be included in the Unit Prices of all other Pay Items included in the Contract, which prices shall be deemed full compensation for furnishing all materials, labor, equipment, tools, and other incidentals necessary for the maintenance of roads and bridges adjacent to the Contract which are used by the Contractor in his haulage operations, including where required, strengthening of existing bridges, installation and maintenance of temporary bridges of other installations, and for traffic control during the performance of the haulage operations and the removal of any traffic controls upon completion of the Works.

Failure of the Contractor in the performance of these works shall entitle the Engineer to carry out such work as he deems to be necessary and to charge the Contractor with the full cost for all operation of maintenance of adjacent roads and bridge which to be carried out by the Engineer or other parties as directed by the Engineer.