

23 Unsealed Pavements

23.1 Scope

This Section sets out the requirements for the maintenance of unsealed **pavements** including **running course, shoulders**, feathered edges and **surface water channels**. It also includes supply, cartage and laying of maintenance aggregate for unsealed roads including preparation of the surface prior to laying.

23.2 Definitions

Terms defined in Table 3.2 Definitions appear in **bold**.

23.3 Response Times

The Contractor must complete all unsealed **pavement** maintenance work as outlined in the following clauses.

23.3.1. Potholes

Potholes shall be repaired within the response time when the depth exceeds 75mm or the area exceeds 0.07m² and/or unless otherwise specified.

Table 23.1 states the response times for repairing all **potholes**. The response times apply from the time of **notification**.

The Contractor shall inspect all roads within the Contract area at least at the frequency listed in Table 23.2 and shall repair **potholes** within the response times.

| Class | Response Time | |
|---------|-----------------|-----------------|
| | May – September | October – April |
| M and U | N/A | N/A |
| R1 | N/A | N/A |
| R2 | 1 Week | 2 Weeks |
| R3 | 2 Weeks | 4 Weeks |
| R4 | 4 Weeks | 4 Weeks |

| Class | Inspection Frequency |
|----------|----------------------|
| M | N/A |
| U and R1 | N/A |
| R2 | Weekly |
| R3 | Weekly |
| R4 | Weekly |

23.3.2. Surface and Shape Restoration

The Contractor must complete all surface and shape restoration work so the **Network** complies with the Surface Condition section (see below) at all times.

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23.3.3. Pavement Repairs

The Contractor shall inspect the **network** and supply a work **programme** to the Engineer within 2 weeks of acceptance of the contract.

The Contractor shall submit monthly to the engineer the proposed **programme** of **maintenance** activities for the following month including the location of all repairs required, indicating priority work, and shall submit the **schedule** together with the proposed method of repair for agreement by the Engineer.

The Contractor shall then complete all work by the agreed completion date.

23.3.4. Maintenance Aggregate

The Contractor must complete the placement of all maintenance aggregate by the date shown on the agreed **Programme**.

Placing of maintenance aggregate shall be carried out as soon as possible following preparation of the road surface but no later than 24 hours following preparation.

The contractor shall notify the Engineer at least 48 hours in advance of the intent to commence carting and placing maintenance aggregate.

The loose surface layer of the maintenance aggregate placed shall not exceed 20 mm after a period of 48 hours.

23.4 Specific Requirements

23.4.1. Weather Conditions

Suitable weather conditions shall prevail during surface and shape restoration work and during cartage and placing of maintenance aggregate. Under no circumstances shall work be carried out during heavy rain, dry windy conditions, or snow.

23.4.2. Pavement Repairs

Materials used in the repair of **potholes** for unsealed roads shall have similar characteristics and properties to the surrounding **pavement** and sufficient fine material to ensure that the repair remains in place.

The finished surface of the repair shall be constructed in accordance with Corrugation and Rutting Repair section (see below).

23.4.3. Surface and Shape Restoration

The Contractor shall maintain the **running course**, feather edges, tapers and **surface water channels** and shall ensure that the maintenance aggregate is **maintained** in a smooth and compacted condition and that the **surface water channels** are **maintained** to meet the criteria

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listed in the **Drainage** section (see below), to prevent ponding of water, and to **maintain** the **pavement** condition by the date shown on the agreed **Programme**.

23.4.4. Widths and Crossfalls

The existing widths and crossfalls of the **running course**, feather edges, tapers and **surface water channels** shall be maintained.

23.4.5. Surface Condition

a) Corrugations

Corrugations shall not be permitted to exceed a maximum of 25 mm from crest to trough.

b) Rutting

Shallow surface ruts up to 50 mm deep, shall be removed and the surface restored to the general crossfall of the road.

c) Loose Surface

Depth of loose maintenance gravel on the **running course** shall not exceed 30 mm loose depth.

d) Transition from Unsealed to Sealed Carriageway

Where the **unsealed carriageway** changes to a **sealed carriageway**, a smooth transition shall be maintained between the two surfaces over a 20 m section within the **unsealed carriageway**. The **sealed carriageway** shall be kept free of all maintenance aggregate during surface and shape restoration.

23.4.6. Maintenance Operation

During any **maintenance** of the **running course** the following requirements shall be adhered to:

- a) The length of road where the **running course** is being disturbed by grading or other means, and which produces a windrow of loose material, shall not exceed 1.0 km.
- b) The height of the windrow of loose material shall not exceed that which will allow an average vehicle to negotiate and cross over without bottoming.

23.4.7. Corrugation and Rutting Repair

Materials used in the repair of corrugations and rutting for unsealed roads shall have similar characteristics and properties to the surrounding **pavement** and sufficient fine material to ensure that the repair remains in place.

The finished surface of the repair shall be constructed in accordance with the Surface Condition section (see above).

23.4.8. Ponding of Water

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The **running course**, **shoulders**, feathered edges and **surface water channels** shall be maintained so that no water ponds.

23.4.9. Pavement Repairs

Repairs shall be dense and stable and not move under the action of traffic.

The finished surface of the repair shall be constructed to the same crossfall and gradient as the adjacent **pavement**. The finished surface shall be such that it does not allow water to pond and there shall be no discernable difference in surface level at the joint between the existing **pavement** and the completed repair.

The contractor shall carry out **pavement** repairs in accordance with the contract documents and the adjusted **schedule**, and be responsible for subsequent maintenance of the repairs during the contract period.

23.4.10. Repair Design

The Contractor must design all digout repairs so a service life similar to that provided by the surrounding **pavement** can be expected.

The Contractor must:

- a) inspect
- b) investigate, including laboratory and field testing
- c) if appropriate, determine the type and quantity of stabilisation agent
- d) mark on the **pavement** surface the location and extent of all proposed digout repairs.

If the replacement of in situ material is the preferred repair method, the Contractor shall demonstrate that other lower priced methods are inappropriate.

23.4.11. Repair Construction

All repairs must be constructed according to this Section except the top 50mm of the repair must be maintenance aggregate complying with the Materials section (see below).

The scope of this section and **schedule** of rates recognises the following methods:

- a) excavation of failed area, backfilling with compaction, and the use of geotextile fabric and/or installation of **drainage** if required.
- b) In-Situ Stabilisation using either cement or lime or a combination of them and replacement of maintenance aggregate to the existing minimum depth at time of repair.

Alternative methods of repair shall be detailed by the Contractor at time of tender including a suitable **schedule** item for payment.

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23.4.12. Variation to Proposed Method

The Contractor shall immediately advise the Engineer of any variation required to the proposed method of undertaking the digout if such variations become apparent after excavation has commenced.

Once the digout is commenced the Contractor shall proceed promptly with the repair. Should any additional work be required due to delay in completion of the digout after commencement, the cost of additional work shall be borne by the Contractor.

23.4.13. Excavation and Drainage

All failed, weak or saturated areas in the existing **pavement scheduled** on the repair **schedule** shall be excavated to the dimensions agreed in the **programme**.

The digout and any **drainage trenches** shall be excavated with **side slopes** suitably **battered** inwards. The base of the excavation shall slope towards the berm at between 4.5% and 6% to match the crossfall of the existing **pavement**.

The base of the excavation shall be thoroughly compacted and contain no hollows which could pond water.

Any improvement to **drainage** proposed within the water tables shall be agreed with the Engineer.

23.4.14. Backfilling

The backfilling shall comprise thoroughly compacted basecourse overlaid with a compacted depth of maintenance gravel to the existing minimum depth at time of repair.

All basecourse and maintenance aggregate shall conform to the Materials section (see below).

23.4.15. Compaction

Compaction of the backfilled material shall produce a digout repair that is uniformly dense and stable and will not move under the action of traffic.

23.4.16. Finished Surface

The finished surface of the repair shall be constructed in accordance with the Surface and Shape Restoration and Surface Condition section (see above).

23.4.17. In-Situ Stabilisation Repairs

A stabilisation repair requires the stabilising of in situ material.

When the Contractor wishes to carry out in-situ stabilisation, full details of the method proposed shall be submitted to the Engineer.

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23.4.18. Maintenance Aggregate

23.4.18.1. Preparation of Carriageway prior to Placement of Maintenance Aggregate

Sections of State Highway **scheduled** to have maintenance aggregate placed shall be prepared by removing all corrugations, rutting and **potholes** and by restoring the road widths and crossfalls, all in accordance with this specification.

Preparation shall include the **running course**, feathered edges, tapers and **surface water channels**. Prior to placing of maintenance aggregate, loose depth of existing maintenance aggregate on the surface shall not exceed 20 mm. Compaction may be required to achieve this.

Placing of maintenance aggregate shall be carried out as soon as possible following preparation of the road surface but no later than 24 hours following preparation.

The contractor shall notify the Engineer at least 48 hours in advance of the intent to commence carting and placing maintenance aggregate.

23.4.18.2. Carting and Placing

Maintenance aggregate shall be placed to the required depth, true to grade and crossfall of the existing **pavement** without segregating.

The placed maintenance aggregate shall be compacted throughout the layer with equipment appropriate to the depths placed. The finished surface shall be dense and trafficable.

The finished surface shall retain its shape and grade. The loose surface layer of the maintenance aggregate placed shall not exceed 20 mm after a period of 48 hours.

23.4.19. Removal and Reinstatement of Existing Edge Marker Posts

Where edge marker posts require temporary removal in order to facilitate work, edgemarker posts shall be reinstated prior to the end of each day and before temporary traffic control signs are removed. Edge marker posts shall be replaced in accordance with TNZ P/16 and materials shall comply with TNZ M/14.

Any marker posts **damaged** by the Contractor's operations shall be replaced with a new marker posts at the Contractor's expense.

23.4.20. Drainage

23.4.20.1. General

The Contractor must pay specific attention to any **drainage** works that may be necessary to ensure the service life is provided.

23.4.20.2. Surface Water Channels

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If required, existing **surface water channels** must be either regraded and **trimmed** or new **surface water channels** constructed. The **side slope** and **batter slopes** forming the **surface water channel** must be according to SOMAC Definitions diagram 3.1.

The **surface water channels** must be graded and shaped so the tie-in with the existing **drainage facilities** is smooth and continuous so water does not pond.

23.4.21. Materials

23.4.21.1. Maintenance Aggregate

All maintenance aggregate must comply with:

- a) the grading for Type 1 or Type 2 Maintenance Aggregate specified in Table 23.3 and the requirements of this clause, or
- b) the grading specified in the Operational Requirements.

| Sieve Size (mm) | Aggregate Grading % Passing | |
|-----------------|-----------------------------|---------|
| | Type 1 | Type 2 |
| 37.5 | - | 100 |
| 19 | 100 | 70 -80 |
| 9.5 | 45 – 75 | 50 – 60 |
| 4.75 | 25 – 55 | 35 – 50 |
| 2.36 | 15 – 35 | 25 – 40 |
| 1.18 | 2 – 35 | 20 – 35 |
| 0.75 | 8 Max | 8 Max |

To reduce the loss of fines from the Type 1 aggregate, the Type 1 aggregate must, with the Engineer's approval, be blended with a cohesive clay fraction, up to 15% by volume. The actual quantity of clay blended with the aggregate must be varied so the desired result is achieved.

The clay fraction must:

- a) be free of all organic, **vegetable** or other deleterious material
- b) pass the 4.75mm sieve
- c) be blended so the blended aggregate has a uniform texture with no segregation of fine and coarse material.

The blended aggregate must have a:

- i) plasticity index of less than or equal to 6. The testing frequency shall be 1 test per 2,000m² of maintenance aggregate constructed
- ii) laboratory 4 day soaked CBR of greater than 60, unsurcharged. The testing frequency shall be 1 test per 5,000m² of maintenance aggregate constructed.

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23.4.21.2. Repair Aggregate

Materials used in the repair of **potholes** for unsealed roads shall have similar characteristics and properties to the surrounding **pavement** and sufficient fine material to ensure that the repair remains in place.

23.5 Performance Criteria

The performance of the Contractor during the Contract Period will be measured by the following criteria:

- a) that all activities are carried out within the timeframes in the agreed monthly **programme** of **maintenance** activities.
- b) the Contractor's demonstrated ability to identify and **schedule** repair work in a competent manner.
- c) that all **potholes** are repaired in accordance with this specification within the response times stated.
- d) that the material used to repair **potholes** remains in place for the duration of the Contract
- e) that all **digouts** placement of maintenance aggregate and **drainage treatments** are repaired in accordance with this specification within the response times stated.
- f) that repaired **digouts** maintain a smooth riding surface for the duration of the contract of no lesser quality than the balance of the road.
- g) that the loose depth of maintenance aggregate does not exceed 20 mm, 48 hours following placing of aggregate
- h) that **roadside furniture damaged** by the contractor is either replaced or repaired promptly.
- i) that no reasonable complaints are received by the engineer on the contractors operation or condition of the road during and after grading
- j) that separate contractors shall at all times co-ordinate and co-operate with each other to ensure standards are meet.
- k) that there are no corrugations exceeding a maximum of 25 mm from crest to trough.
- l) that there are no shallow surface ruts deeper than 50 mm deep, and that in repairing rutting the surface is restored to the general crossfall of the road.
- m) that the depth of loose maintenance gravel on the **running course** does not exceed 30 mm loose depth.
- n) that where the **unsealed carriageway** changes to a **sealed carriageway**, a smooth transition is maintained between the two surfaces over a 20 m section within the **unsealed carriageway**.

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The sealed carriageway shall be kept free of all maintenance aggregate during surface and shape restoration.

