

11 Surfacing

11.1 Scope

This Section sets out the requirements for:

- a) surfacings of repairs and **pre-reseal** repairs, including first coat seals, **premix** surfacings, and where required **second coat sealing**.
- b) repairing surface defects, including but not limited to **crack** sealing and filling, **scabbing**, **stripping**, **flushing** and **bleeding**.

11.2 Definitions

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

11.3 Response Times

The Contractor must complete all work required by this Section by the dates shown on the agreed **programme**. In addition:

- a) Table 11.1 states the response time for reinstatement of all **pavement** markings, raised **pavement** markers and removal of all loose chip from site.
- b) **incidents** requiring urgent attention will be managed using Section 9 **Incident** Response (e.g. **bleeding**)
- c) the Contractor shall monitor the weather throughout the contract period in accordance with the requirement of clause 11.3.1.1 and when **bleeding** is anticipated, respond in sufficient time.

Table 11.1: Reinstatement of Roadmarkings, Raised Pavement Markers and Removal of Loose Chip			
Class	Response Time		
	Pavement Markings*	Raised Pavement Markers	Removal of Loose Chip*
All Highways	Within 48 hours of completing first coat and, where required, second coat seals	Within 72 hours of completing the second coat seal , or as specified for pre-reseal repairs	Within 48 hours

* Note: All loose chip must be removed prior to reinstatement of **pavement** markings. All **pavement** markings must be reinstated and loose chip must be completely removed from site prior to the removal of temporary traffic control.

Where the repair is a **pre-reseal** repair, a **second coat seal** is not required.

11.3.1.1. Weather Observation (Monitoring)

The Contractor must determine when and where **pavement gritting** may be required and place the appropriate resources on stand by. This will be achieved through:

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- a) monitoring the weather throughout the contract period
- b) communicating regularly with the Engineer during periods when there is a risk of **bleeding**, to ensure, as far as possible, hazards are anticipated.

11.4 Specific Requirements

All **pavement** repairs must have a sealed surface:

- a) at the end of each day's work, unless circumstances, e.g. weather, are not suitable for surfacing (see Section 11.4.2)
- b) which is maintained for the duration of all public holidays and the periods specified in First **Schedule**, Part B, Clause 1.2, Definitions.

11.4.1. Surface Defect Repairs

- a) All surface defects must be repaired according to the Operational Requirements, the Maintenance Intervention Strategy and the following requirements, unless otherwise agreed.
- b) The PSV of all sealing chip and other surfacing aggregates must comply with TNZ T/10 or as stated in the Operational Requirements, unless otherwise agreed, except for:
 - first coat seals, which are programmed for a **second coat seal** within 3 months, and,
 - **pre-reseal** repairs.
- c) Surface defect repairs and, in particular, **texturising** must not be used for **pre-reseal** repairs. In general this work will be completed by the resurfacing contractor.

Much of the repair work associated with highway **routine maintenance** involves chip sealing the surface of repairs.

11.4.2. Construction of Surface Sealing

The final surfacing shall be of the same type as the surrounding **pavement**, except for **pre-reseal** repairs where the texture and hardness of the first coat seal must be consistent with the reseal design, at the intended time of reseal.

If for any reason the seal coat is not achieved on the same day, the Contractor shall take positive steps to ensure that the repair surface does not unravel allowing loose material on the road surface. Should ravelling occur the Contractor shall immediately remove all loose material from the road surface and stabilise the surface of the repair. The Contractor may maintain the integrity of the repair by application of a temporary holding coat providing this is not detrimental to the final seal coat and if a first coat seal cannot be achieved within two days.

All **pavement** repairs must have a **sealed carriageway** surface which is maintained for the duration of all public holidays and long weekends specified in First **Schedule**, Part B, Clause 1.2 Definitions.

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Once all surfacing work is complete, the repair must comply with the tolerances stated in Appendix 2.3 so there is a smooth transition from the adjoining **pavement** on to and off the repair and no ponding of water.

That the finished **pre-reseal** repair, including asphaltic joints, is **flush** with existing **pavement** surfaces and utility covers so as not to create adverse noise and vibration effects.

11.5 Treatments

11.5.1. First Coat Sealing

The first coat seal must overlap the area of the repair by 100mm to 150mm and when complete present a tidy appearance of rectangular shape; ragged edges will not be accepted.

If agreed, the Contractor may use alternatives such as two coat sealing, slurry seal or thin **asphaltic concrete** overlay.

11.5.2. Second Coat Sealing

Unless otherwise agreed or specified in the Contract Documents, all repairs except **pre-reseal** repairs, must be **second coat sealed**.

- a) The **second coat seal** must overlap the first coat seal by 100mm to 150mm, and when complete present a tidy appearance of rectangular shape; ragged edges will not be accepted
- b) be constructed such that six months after completion, the texture of the repair shall be consistent with the surrounding **pavement** surfacing
- c) not show evidence of blackening of the surface of the **pavement** immediately beyond the repair caused directly by excess binder tracked from the repair.

11.5.3. Premix Surfacing

All **premix** surfacing must be designed and constructed to comply with the requirements of the Definition section and, six months after completion, the texture of the repair shall be consistent with the surrounding **pavement** surfacing, or in the case of **pre-reseal** repairs, the texture and hardness of the **premix** must be consistent with the reseal design, at the intended time of reseal.

11.5.4. Crack Sealing and Filling

The Contractor shall ensure that **cracks** are effectively sealed and shall be responsible for the chip size, binder type and quantity proposed for use in the particular repair.

Crack filling shall be completed to a sufficient width to ensure that the **crack** is fully covered with sealing product.

The Contractor shall ensure that the final surface texture matches the existing and that no **bleeding** or **flushing** occurs during the Contract period.

Cracks requiring filling are covered below.

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11.5.4.1. Crack Filling

When **crack** filling either prior to sealing or as a single **treatment** is specified, it is the Contractor's responsibility to ensure that areas to be treated are free from excess moisture and prepared by removing any **grit**, dirt, **detritus** or other deleterious matter prior to the filling of the **cracks** with one of the following materials, or an approved alternative material.

a) **Cracks** not wider than 5 mm

A bituminous binder.

b) **Cracks** wider than 5 mm but not wider than 20 mm

A bituminous binder with filler. A waterproofing seal coat shall be applied following **crack** sealing.

c) **Cracks** wider than 20 mm

A fine **premix** material. A light tackcoat shall be applied to the sides of the **cracks** to be filled, and a waterproofing seal coat shall be applied following **crack** sealing.

d) Polymer modified proprietary materials

Such materials shall be applied strictly in accordance with the manufacturers' instructions. These may be used for all **cracks** over 5 mm in width. In **asphaltic concrete**, polymer modified material shall be applied over all **cracks** in a 100 mm wide strip as a stress-absorbing bandage.

11.5.4.2. Slippage Cracks

If removal and replacement of the in situ material is required in order to repair a slippage **crack**, the repair must be completed as a digout repair (see Section 12).

11.5.5. Scabbing and Stripping

11.5.5.1. Extent of Area to be Treated

Only the area of **scabbing** or **stripping** shall be treated and this shall be marked on the road surface.

11.5.5.2. Surface Preparation

Areas to be treated shall be free from excess moisture and prepared by removing any **grit**, dirt, **detritus** or other deleterious matter prior to the application of binder.

11.5.5.3. Alternative Treatment for Stripping

Where the Contractor considers there to be adequate bitumen present, a proposal to liven the binder using diluent may be submitted to the Engineer for approval.

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11.5.5.4. Application of Binder

Binder shall be applied in a fine mist spray.

a) Scabbing

Binder shall be applied only to the area of **scabbing**. Care must be taken to avoid spraying binder on to the surrounding **pavement**.

b) Stripping

Binder shall be applied to the width specified by the Engineer.

11.5.6. Flushing and Bleeding

The Contractor must nominate the method to repair **bleeding** or **flushed** areas.

11.5.6.1. High Pressure Water Treatment

If high pressure water **treatment** (e.g. waterblasting) is proposed then it must be performed in accordance with Transit Specification TNZ P/26.

11.5.6.2. Diluent and Chip

Precoated chip or heated chip shall be produced by a method approved by the Engineer.

Sufficient diluent shall be sprayed on the road surface under suitable weather conditions to liven the binder to ensure a satisfactory chip take.

The Contract shall select appropriate chip size, diluent and adhesion agent following the principles in *Chip Sealing in New Zealand*, Chapters 8 and 12.

Chip spreading must follow immediately on spraying of the diluent. The Contractor must ensure there is sufficient rolling to bed the chip.

11.5.6.3. Pavement Gritting

Pavement gritting is used for the **treatment** of **bleeding**. **Gritting** must be completed with sealing chips that are no larger than the surrounding surface, but sufficiently large to prevent subsequent **flushing** through binder rise.

The sealing chip may be hand spread, but care must be taken to avoid over chipping.

All surplus chip must be removed from the traffic lanes at the end of each day and completely removed from the Site once the **bleeding** is controlled.

11.5.7. Cold Milling

11.5.7.1. Extent of Area to be Treated

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Only the area marked or defined by the Engineer on the road surface shall be **cold milled**.

11.5.7.2. Cold Milling

Where the **cold milled** area is to be backfilled, all edges shall be finished vertical. No longitudinal or transverse vertical edges shall be left unprotected and exposed to traffic overnight.

All **cold milling** machines with a drum width of more than 750 mm shall be equipped with a self loading conveyor.

All contaminants and milled material shall be intercepted and disposed of at an approved disposal site or stockpiled for future recycling or other reuse.

All stormwater outlets, sumps, service boxes and **manholes** shall be protected against **damage**. All spoil shall be removed from the site.

11.5.7.3. Finished Surface

The depth **cold milled**, after removal of all loose material, shall be -0 mm, $+5$ mm of the specified depth. The finished surface shall vary by no more than 5 mm from a 3 m straightedge laid longitudinally or a 1 m straightedge laid transversely, including between adjacent runs.

11.5.8. Other Treatments

The Operational Requirements details the technical requirements and applications of the other **treatments**.

11.6 Performance Criteria

11.6.1.1. Area of Compliance

The performance criteria listed under clause 11.6.1.2 shall apply to the entire surface area of the work, or to any part of it providing the area affected by failure is no less than an area of 0.1m^2 .

11.6.1.2. Performance Criteria

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

- a) that all repairs are carried out in accordance with this Specification by the date shown on the agreed **programme**, and within the response times stated.
- b) inspections are completed on time and inspection records are available when requested by the engineer.
- c) the chip sealing, including first coat seals, **second coat seals** and repairs of all surface defects:
 - i) does not **flush, bleed** or **strip** before the end of the **defects liability period**,

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- ii) there are no loose chips on the road surface on completion of the repair,
 - iii) the surfacing aggregate remains proud of the binder
 - iv) the binder is not picked up by tyres
 - v) the skid resistance shall not deteriorate such that it is significantly lower than that apparent in the same cross section location on the **pavement** immediately before and after the work.
- d) that the **sealed carriageway** surface of **second coat seals** and repairs of all surfaces have a consistent texture 6 months after the construction of the **second coat seal**, except for **pre-reseal** repairs where the texture and hardness of the first coat seal must be consistent with the reseal design, at the intended time of reseal.
- e) that material used for **crack** filling and sealing shall remain in place, waterproofing the **crack**, for the length of the **defects liability period**.
- f) that **treatment** of **flushing**, **scabbing** or **bleeding** leads to an improvement in road condition.
- g) repairs shall be constructed to the tolerances in Appendix 2.3.