SECTION 430 - HIGH FRICTION SURFACE TREATMENT

##This section cross-references Sections 175 and 721.

If any of the above sections are relevant, they should be included in the specification.

If any of the above sections are not included in the specification, all references to those sections should be struck out, ensuring that the remaining text is still coherent:

430.01 GENERAL

This section covers the requirements for the supply and placement of high friction surface treatment (HFST).

430.02 DEFINITIONS

The following definitions apply to the high friction surface treatment clauses.

**Accelerant**

Accelerant refers to any material used to reduce the curing time of the binder.

**Aggregate**

Aggregate refers to any natural or synthetic particles used as a cover material applied to the binder, to provide texture and skid resistance to achieve a high friction surface treatment.

**Aggregate Coating**

Aggregate coating includes all materials used to cover and/or colour aggregate.

**Aggregate Retention**

Aggregate retention refers to the ability of the binder to adhere and retain the aggregate under traffic or maintenance conditions.

**Binder**

Binder refers to any resin used to bond the aggregate to the existing road surface.

Cleaning Agents

Cleaning Agents include all materials used to remove dirt, grime, fuel, oil and other materials from the existing surface.

Delamination

Delamination includes failure of the binder and aggregate to adhere to the existing pavement surface.

**High friction surface treatment**

High friction surface treatments provide increased skid resistance for vehicles. The treatment consists of a binder applied to the existing road surface, and aggregate spread over the binder surface. High friction surface treatment may include an additional layer of binder over the aggregate layer.

Paint

Paint shall comply with the relevant standard listed in Section 175.

Polished Stone Value

Polished Stone Value of aggregate shall be determined in accordance with VicRoads Test Method RC374.01, or BS EN 1097‑8.

Priming Material

Priming material refers to any substance used to clean and prepare the existing road for the application of binder. Priming materials may be used to improve the adhesion of the binder to the existing roadway.

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Protective Sealer

Protective sealer refers to any substance used to protect and seal the high friction surface treatment from fuel and oils spills from traffic.

Sideways Force Coefficient (sfc)

Sideways Force Coefficient, also called sideways-friction coefficient, is a general term for the sideways-force to the vertical reaction on the SCRIM ® test wheel.

Skid Resistance

Skid resistance is the friction between the vehicle tyre and the pavement surface. Skid resistance shall be measured using a Sideways-force Coefficient Routine Investigation Machine (SCRIM ®), and in accordance with VicRoads RC421.02.

Note: SCRIM ® is a registered trademark of WDM Limited.

Surface Texture

Surface texture refers to the mean height of aggregate particles above the level of the binder. Surface texture shall be measured in accordance with the VicRoads Surface Texture by Sand Patch RC317.04.

Test Lots

Acceptance of work and materials shall be based on testing of the work or material in lots. A lot will consist of a single batch or area of like work which has been constructed under essentially uniform conditions and is essentially homogeneous with respect to material and appearance. A lot shall be the smaller of either each day’s production, or each 500 m2 placed each day.

Discrete portions of a lot which are non-homogeneous with respect to material and appearance shall be excluded from the lot and either treated as separate lots, or replaced. Where the areas excluded from a lot as non-homogeneous exceed 20% of the total lot area, the whole of the lot shall be rejected.

Thermoplastic

Thermoplastic shall comply with the relevant standard listed in Section 175.

430.03 DETAILS OF MATERIALS

(a) Binder

 The binder shall be:

 • resistant to fuel and oils spills from traffic

 • non flammable after placement and curing on road surface

 • able to be broomed and high pressure water cleaned without damage

 • free from lead

 • capable of providing strong adhesion between the existing surface and the aggregate to achieve a uniform surface.

 Thermoplastic binders are not permitted. Paint is not permitted as a binder.

 The following binder details shall be provided to the Superintendent at least 14 days prior to the start of works:

 (i) priming materials type and source

 (ii) manufacturer's recommendations/instructions for priming material supply and placement

 (iii) binder type and source

 (iv) manufacturer's recommendations/instructions for binder mix quantities and tolerances on mixing components

 (v) manufacturer's recommendations/instructions for mixing of binder (and components)

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 (vi) manufacturer's recommendations/instructions for pot life of binder, i.e. time of mixing to time of spreading

 (vii) manufacturer's recommendations/instructions for placement of binder including placement quantities and tolerances and placement temperatures

 (viii) manufacturer's recommendations/instructions for curing

 (ix) manufacturer's recommendations/instructions for accelerants (if applicable)

 (x) manufacturer's recommendations/instructions for supply and placement of protective sealers.

(b) Aggregate

 The aggregate shall be clean, of uniform shape and quality, free from dirt, free from clay and organic matter, resistant to fuel and oils spills from traffic, able to withstand traffic stresses without damage, and able to be broomed and cleaned with high pressure water without damage.

 The following aggregate details shall be provided to the Superintendent at least 14 days prior to the start of works:

 (i) aggregate type, source and gradation

 (ii) manufacturer's or Contractor’s recommendations/instructions for placement of aggregate including spread rate

 (iii) Polished Stone Value of the aggregate.

(c) Product Performance

 Documented evidence of satisfactory performance over at least 5 years for the high friction surface treatment in a heavy urban traffic environment shall be provided with the Tender. The documentation may include; references from clients, details of sites with the high friction surface treatment, evidence of texture with time, evidence of skid resistance with time, evidence of colour retention with time, evidence of durability with time.

 Restricted use of untried products on a trial basis shall be subject to the approval of the Superintendent.

 The Superintendent may request additional information regarding performance of the proposed high friction surface treatment at no additional cost. The Superintendent shall determine if the documented evidence is satisfactory. Only products with satisfactory documented evidence will be considered for award of the works.

 Acceptance of the documented evidence and acceptance of the proposed high friction surface treatment does not guarantee the performance of the high friction surface treatment, and does not relieve the Contractor from any of the requirements of this document.

430.04 ENVIRONMENTAL PROTECTION

The high friction surface treatment shall not emit offensive odours after opening to traffic, such that complaints are received by VicRoads. The Superintendent shall determine if the high friction surface treatment is producing offensive odours, and if the material is therefore unacceptable. The Superintendent’s decision will be final.

High Friction surface Treatment which is deemed to be unacceptable shall be rectified with the agreement of the Superintendent.

430.05 SITE PREPARATION

The existing pavement markings at the site may be covered by the surface treatment by the Contractor as part of the site preparation works, or may be masked to ensure the high friction surface treatment is not applied to the markings. All Raised Reflective Pavement Markers (RRPMs) may either be removed from the area of works prior to any high friction surface treatment being placed, or masked to ensure the high friction surface treatment is not applied to the RRPMs. All masking shall be removed prior to opening the site to traffic.

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All reinstatement of RRPMs and pavement markings shall be in accordance with Section 721.

Any damage caused to the surface by the removal of pavement marking and RRPMS shall be repaired prior to placement of high friction surface treatment. The proposed methods of removal and repair shall be submitted to the Superintendent for approval.

All loose material, grit, stones, vegetative matter, and rubbish shall be removed from the area of works prior to placement of high friction surface treatment.

The site may be further cleaned and prepared as required by the Contractor. Cleaning and preparation shall not cause structural damage to the pavement. All cleaning agents and collected material shall be removed from site in accordance with EPA requirements for the type of waste generated.

##(stikeout this paragraph if not required):Cracks and sawcut traffic detector loops in the existing surface shall be masked with a maximum of 50 mm total width of tape. The masking tape shall ensure high friction surface treatment is not placed over the cracks and detector loops, and shall be removed after the high friction surface treatment is placed.

**HP High friction surface treatment shall not be placed until the Superintendent and Contractor agree the road surface is ready for surfacing.**

430.06 PLACEMENT

High friction surface treatment shall be applied to produce a visually uniform surface. The edges of the work shall provide a neat and clean line onto the adjacent surface.

(a) Priming Materials

 Priming Materials may be used on all or part of the site at the Contractor’s discretion.

(b) Binder

 Binder shall be spread to provide a uniform thickness over the site. The spread rate for each lot of material shall be determined by mass or volume divided by the area, and the result recorded. All spread rates for the work shall be provided to the Superintendent.

(c) Aggregate

 Aggregate shall be spread to provide a uniform thickness over the site. The spread rate for each lot of material shall be determined by mass or volume divided by the area, and the result recorded. All spread rates for the work shall be provided to the Superintendent.

(d) Temperature

 The pavement temperature of the site shall be measured and recorded at least every 2 hours during the works. The temperature shall be measured using an infrared temperature gauge accurate to +/‑2˚C. The temperature results shall be provided to the Superintendent.

(e) Accelerants

 Accelerants may be used to reduce the time of curing for the high friction surface treatment. The spread rate for each lot of material shall be determined by mass or volume divided by the area, and the result recorded. All spread rates for the work shall be provided to the Superintendent.

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430.07 SCHEDULE OF DETAILS

**\*\*\*** The details for each site of works for HFST are:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Job No** | **Road Name** | **Map Ref** | **Location** | **Approx Area (m2)** | **24 hr AADT** | **Other requirements** |
| ##: | ##: | ##: | ##: | ##: | ##: | ##: |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

No additional payment or deduction shall be made where the measured total area of each job falls within 2.5% of the listed area.

430.08 CLEAN-UP

All excess material shall be removed from the site. The removal of loose aggregate and disposal from site is the responsibility of the Contractor.

Excess aggregate shall be removed from the finished surface prior to opening the site to traffic. Excess aggregate shall be removed from the roadway, kerb and channel, driveways and any trafficked and untrafficked areas prior to opening to traffic.

**HP The Contractor and Superintendent shall agree the site is neat, tidy and free of excess aggregate, prior to opening to traffic.**

Material which becomes loose after the initial clean-up shall be removed at 24 hours, 3 days and 14 days after placement unless otherwise directed by the Superintendent.

430.09 ACCEPTANCE OF WORK

High friction surface treatment shall provide a visually uniform surface with uniform aggregate retention, and be free from delamination, stripping and areas of wear/scuffing.

(a) Surface Texture

 The surface texture of high friction surface treatment shall be a minimum of 0.6 mm as measured using VicRoads Surface Texture by Sand Patch. Each lot of material shall be tested within 2 weeks of initial placement, and within 8 weeks prior to the end of the defects liability period.

(b) Skid Resistance

 The skid resistance of the high friction surface treatment shall be a minimum of 0.60 sfc during the defects liability period.

 The length of entire site shall be tested using SCRIM ® in the left and right wheel paths in every through traffic lane of the site. The site shall be tested within 4 weeks of initial placement, and within 8 weeks prior to the end of the defects liability period. The Superintendent may undertake additional skid resistance testing of the site at any time during the defects liability period.

 VicRoads will undertake the skid resistance testing using SCRIM ®. The cost of the testing will be covered by VicRoads. A copy of the results will be available to the Contractor on request.

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430.10 MAINTENANCE AND REPAIRS

The Contractor shall be responsible for monitoring and maintenance of the high friction surface treatment from the time of placement, until the end of the defects liability period.

The Contractor shall carry out any works necessary to protect and maintain the surface, and effect repairs to all surface failures. Such failures include but are not limited to loss of aggregate, bleeding, fatty areas, flushing, loss of skid resistance, and delamination from the existing surface.

The Contractor is not responsible for defects caused by either settlement or failure of the existing pavement, or for damage (including gouging and vehicle fire) and repairs to the surface caused by traffic incidents.

Areas of delamination less than 0.5 m2 are not required to be repaired, unless the total of defective areas exceeds 10% of any area. Areas of defect shall be agreed with the Superintendent. Areas shall be squared-up and extend to the width of the traffic lane. Defective high friction surface treatment shall be removed and replaced.

Repairs shall be undertaken within 4 weeks of notification by the Superintendent. Urgent repairs shall be started onsite within 3 hours of notice by the Superintendent.

**HP The Contractor shall advise the Superintendent in writing of the proposed treatment for any repairs before undertaking the work.**

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