

SECTION 3010 – BITUMINOUS PAVEMENT MAINTENANCE AND REPAIR

BITUMINOUS PAVEMENT MAINTENANCE AND REPAIR

PART 1 – GENERAL

1.01 Section Summary

- A. Bituminous pavement patching, tack coat, crack sealing, and seal coating.

1.02 Related Sections

- A. Section 1500 – Removals
- B. Section 2900 – Aggregate Base Course
- C. Section 3000 – Hot Mix Asphalt Pavement

1.03 References

- A. North Dakota Department of Transportation “Standard Specification for Road and Bridge Construction” 2014 Edition, As Revised.
 - 1. Section 401 – Prime, Tack or Fog Coat
 - 2. Section 420 – Bituminous Seal Coat
 - 3. Section 430 – Hot Mix Asphalt (HMA)
 - 4. Section 816 – Aggregates
 - 5. Section 818 – Bituminous Materials
 - 6. Section 826 – Joint Materials
- B. North Dakota Department of Transportation “Field Sampling and Testing Manual” 2008 Edition, as revised.
- C. Federal Highway Administration “Manual on Uniform Traffic Control Devices” (MUTCD), 2009 Edition, as revised.

1.04 Submittals

- A. All submittals are due to the Engineer at least 14 days prior to construction.
- B. Submittals shall be as follows, as applicable to the project:
 - 1. Pavement patching/leveling: per Section 2900 – Aggregate Base Course and Section 3000 – HMA Pavement.

2. Crack sealing: per Section 826 of the NDDOT Specification, except submit manufacturer's data only; no samples are required.
3. Bituminous seal coating: per Section 420 of the NDDOT Specification.

PART 2 – PRODUCTS

2.01 Aggregate Base

- A. Aggregate base for patches, when required, shall conform to Section 2900 – Aggregate Base Course.

2.02 HMA Materials

- A. Aggregate: Conform to NDDOT Specification Section 430 for FAA 43.
- B. Asphalt Cement: Unless otherwise specified on the Plans, PG 58-28 asphalt cement conforming to AASHTO M 320 shall be specified.
- C. Tack Coat: CSS-1h or SS-1h emulsified asphalt.
- D. Fog Coat: CSS-1h diluted to equal parts water to emulsion (1:1).

2.02 Crack Sealing

- A. Sealant: Asphalt rubber sealant with a minimum of 12 percent rubber of the total weight of sealant, meeting ASTM-D6690 and AASHTO M226 or Federal Specification SS-S-1401C.

2.03 Seal Coating

- A. Bituminous Seal: Modified Cationic Emulsified Asphalt - CRS-2P.
- B. Aggregate: NDDOT Class 41M aggregate.
- C. Blotter Sand: NDDOT Class 44 aggregate.

PART 3 – EXECUTION

3.01 General

- A. Before pavement maintenance and/or repair operations can begin:
 1. Submittals must be received and approved by the Engineer.
 2. The Contractor shall place and maintain work zone traffic control devices as the work progresses in accordance with the MUTCD. Refer to specific requirements for seal coat projects below.

3. Any other designated work relative to the pavement maintenance and/or repair, i.e., structure adjustments, concrete curb and gutter and/or sidewalk ramps and concrete drive approaches shall be constructed and accepted.

3.02 Patching

- A. Pavement repair operations which require the use of a paving machine due to the extent of the repair being made shall be completed and paid for in accordance with Section 3000 – Hot Mix Asphalt Pavement.
- B. Pavement repair areas shall be marked by the Engineer.
- C. Patching shall include the removal of existing pavement and replacement with Hot Mix Asphalt Pavement (HMA) FAA 43, PG 58-28 to specified thickness.
- D. All pavement repair patches shall be saw cut full depth prior to removal. Coulter cutting shall be permitted as long as edges are cut straight.
- E. The existing base material must be approved by the Engineer prior to placement of bituminous materials. Areas requiring replacement of the existing base material or subgrade shall be excavated to the depths as indicated on the Plans or as directed by the Engineer. Sub-cuts shall be reviewed by the Engineer after notification of the condition by the Contractor. Engineer approval is required prior to the Contractor starting work on any over-excavation.
 1. Sub-cut areas shall be replaced with Class 5 Aggregate Base, and shall be constructed and paid for under the separate bid items for Common Excavation, Subgrade Preparation, Geotextile Fabric (if required by the Engineer), and Class 5 Aggregate Base (except for the first 3 inches) as indicated on the Bid Proposal Form.
- G. Edges of existing bituminous or concrete shall be tacked prior to placement of bituminous pavement. Tack coat shall not be measured separately and will be included in the Unit Bid Price for the Bituminous Pavement Repair Bid Item.
- H. HMA lift thickness: Base course lifts shall be from 1.5 inches to 2.5 inches in thickness. Wear course lift shall not exceed 2.0 inches.
- I. Each lift of all HMA patches shall be compacted by vibratory methods unless patches are larger than 450 SF and as specified otherwise on the plans or directed by the Engineer.

3.03 Leveling

- A. Shall be in accordance with Section 3000 – Hot Mix Asphalt Paving.

3.04 Crack Sealing

- A. Apply sealant when ambient air temperature is 40°F or higher.
- B. Cracks less than $\frac{3}{4}$ inch wide shall be routed to a depth not to exceed $\frac{3}{4}$ of the router bit diameter. Cracks larger than $\frac{3}{4}$ inch wide do not need to be routed.
- C. All cracks shall be cleaned with compressed air prior to placement of sealant.
- D. Sealant shall be applied at the rate necessary to fill the crack but shall not be excessively placed.
- E. Sealant shall be covered with paper to protect the sealant while curing.

3.05 Seal Coating

- A. Seal coat operations shall conform to NDDOT Specification Section 420 except as modified herein:
 - 1. Prior to seal coat application, all patching, leveling, and crack sealing must be complete and have been in place for at least 14 days. All masking and structure protection must be in place and approved by the Engineer.
 - 2. Seal Coat work shall be completed by September 1st unless written permission is obtained by the City Engineer.
 - 3. Steel wheel rollers shall not be allowed.
 - 4. Asphalt emulsion application rates shall be specified on the Plan or as directed by the Engineer. Aggregate shall be applied to cover the emulsion uniformly before the emulsion "breaks".
 - 5. Blotter material shall be used where bleeding occurs. Material must be spread with a mechanical spreader.
 - 6. The maintenance period shall be considered incidental and shall last 14 days after completion of the entire project.

7. After the seal coat has set and within 48 hours of application, the Contractor shall sweep and remove any loose cover coat material. If Contractor fails to sweep areas within the time specified, the City reserves the right to remove the material and assess the charges of doing so to the Contractor either directly or by offsetting any payments due.
8. Traffic signs shall be temporarily installed warning traffic with the phrase "Fresh Oil Loose Rock." The signs shall be located at each entrance to the project area and shall remain in place until the maintenance period is complete.
9. Temporary marking tabs shall be required on previously striped streets and on streets that will receive new pavement markings. Color shall match existing striping where applicable. Temporary marking tabs shall meet NDDOT Standard Detail D-704-3. Temporary marking tabs shall be removed after permanent markings are in place.
10. Manholes and gate valves shall be protected prior to application of the seal coat. All coverings shall be tabbed or marked and shall be removed after the seal coat has been applied and rolled.

3.07 Fog Coat

- A. Fog Coat operations shall conform to NDDOT Specification Section 401 except as modified herein:
 1. Fog Coat work shall be completed by September 1st unless written permission is obtained by the City Engineer.
 2. Application rates shall be specified on the Plan or as directed by the Engineer.

PART 4 MEASUREMENT AND PAYMENT

- A. General
 1. All preparatory cleaning of pavement surfaces and cracks as specified herein shall be considered incidental to related bid items.
 2. The price bid for each bid item shall include all materials, equipment and labor necessary to complete the work for that bid item as specified herein and as shown on the Plans.

B. HMA Full Depth Patch: Pavement patches shall be paid for by the square foot (SF) and shall include saw cutting and removal of existing pavement, removal of 3 inches of subgrade material where no aggregate base exists, placement of 3 inches of aggregate base material, leveling and compacting new or existing aggregate base, and placement of 3.5 inches (unless otherwise specified) of hot mix asphalt pavement with tack coat as specified and detailed on the Plans.

1. Price is dependent on the size of the patch and bid items will be provided as follows:

- a. Repair areas up to 60 SF.
- b. Repair areas between 60 SF and 200 SF.
- c. Repair Areas 200 SF and up.

2. Patches with HMA thicknesses over or under 3.5 inches will be paid proportionally based on linear interpolation by applying a pay factor to the bid item quantity. Pay factors for common thicknesses are as follows:

Remove and Replace Pavement Thickness	Bid Item Quantity Pay Factor
2.0 inches	0.571
3.5 inches	1.000
4.0 inches	1.143
4.5 inches	1.296
6.0 inches	1.714
7.0 inches	2.000

3. Contractor must notify the Engineer of subcut areas and patches with a thickness varying from 3.5 inches before work begins. Subcuts and patches with no notification will not be considered for additional quantity.

4. Subcut area items shall be paid for separately as follows:

- a. Common Excavation: Per Section 1800 – Excavation and Embankment.
- b. Subgrade Preparation: Per Section 1900 – Subgrade Preparation
- c. Geotextile Fabric: Per Section 2900 – Aggregate Base Course

- d. Class 5 Aggregate Base: Per Section 2900 – Aggregate Base Course (except for the first 3 inches, which is included in HMA Full Depth Patch item).
- C. Crack Sealing: Shall be paid for by the linear foot (LF) for Routed or Non-Routed.
- D. Bituminous Seal Oil, CRS-2P: Shall be paid for by the gallon (GAL) measured at 60° F.
- E. Cover Coat Aggregate, Class 41M: Shall be paid for by the square yard (SY) as measured in the field.
- F. Blotter Sand, Class 44: Shall be paid for by the ton (TN).
- G. Fog Coat, CSS-1h: Shall be paid for by the gallon (GAL) measured at 60° F.
- H. All costs to properly complete the work specified herein and/or shown on the Plans shall be included in the prices bid for these or other items unless applicable bid items are included on the Bid Form.

END OF SECTION