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USACE / NAVFAC / AFCEA UFGS-02743N (September 1999)

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Preparing Activity: NAVFAC Replacing without revision  
NFGS of same number and date

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 25 June 2004

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### SECTION 02743N

#### BITUMINOUS PRIME COAT 09/99

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NOTE: This guide specification covers the requirements for bituminous prime coat.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

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## PART 1 GENERAL

### 1.1 REFERENCES

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NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest guide specification. Use of SpecsIntact automated reference checking is recommended for projects based on older guide specifications.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 140 (2001) Sampling Bituminous Materials

ASTM D 2026 (1997) Cutback Asphalt (Slow-Curing Type)

|             |   |
|-------------|---|
| ASTM D 2027 | (1997) Cutback Asphalt (Medium-Curing Type) |
| ASTM D 2028 | (1997) Cutback Asphalt (Rapid-Curing Type)  |
| ASTM D 2397 | (2002) Cationic Emulsified Asphalt          |
| ASTM D 977  | (2003) Emulsified Asphalt                   |

U.S. ARMY CORPS OF ENGINEERS (USACE)

|            |   |
|------------|---|
| EM 385-1-1 | (2003) Safety -- Safety and Health Requirements |
|------------|---|

## 1.2 SUBMITTALS

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NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Cutback asphalt

Submit temperature viscosity relationship.

SD-06 Test Reports

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NOTE: When certified laboratory tests would be adequate to ensure the quality of bituminous materials, use this paragraph and delete paragraph entitled "Field Quality Control." Where combination is possible, retain paragraph entitled "Field Quality Control."  
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Bituminous materials

### 1.3 DELIVERY, STORAGE, AND HANDLING

Inspect the materials for contamination and damage. Unload and store the materials with a minimum of handling.

### 1.4 ENVIRONMENTAL REQUIREMENTS

Apply the prime coat only when the surface is dry or contains moisture not in excess of the amount that will permit uniform distribution and the desired penetration. Apply the prime coat only when the ambient temperature is 10 degrees C 50 degrees F or above and when the temperature has not been below 1.7 degrees C 35 degrees F for 12 hours immediately prior to application, unless otherwise directed.

### 1.5 SAFETY REQUIREMENTS

Perform the work in accordance with EM 385-1-1.

### 1.6 CONSTRUCTION EQUIPMENT

Provide equipment dependable and adequate for the purpose intended and properly maintained in satisfactory and safe operating condition at all times. Calibrated equipment such as asphalt distributors, scales, batching equipment, spreaders and similar equipment, shall have been recalibrated by an approved calibration laboratory within [12] [\_\_\_\_\_] months prior to commencing work [and every [\_\_\_\_\_] months thereafter, by such laboratory from the date of recalibration, during the term of the contract].

#### 1.6.1 Bituminous Distributor

Bituminous distributor shall have pneumatic tires of such width and number that the load produced on the base surface shall not exceed 295 kg per 25 mm 650 pounds per inch of tire width. The bituminous distributor shall be designed and equipped to distribute the bituminous material uniformly at even heat on variable widths of surface at readily determined and controlled rates from 0.23 to 9.05 liters per square meter 0.05 to 2.0 gallons per square yard, with a pressure range of 172.4 to 517.1 kPa 25 to 75 pounds per square inch and an allowable variation not to exceed 5 percent from any specified rate. Distributor equipment shall include a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for

heating the materials to the proper application temperature, a thermometer for reading the temperature of the tank contents, and a hose and spray nozzle attachment for applying bituminous material to spots unavoidably missed by the distributor and to areas inaccessible to the distributor. The distributor shall be equipped to circulate and agitate the bituminous material during the heating process.

#### 1.6.2 Heating Equipment for Storage Tanks

The equipment for heating the bituminous material shall be steam, electric, or hot oil heaters. Steam heaters shall consist of steam coils and equipment for producing steam, so designed that the steam cannot get into the material. An armored thermometer with a temperature range from 4.4 to 204.4 degrees C 40 to 400 degrees F shall be fixed to the tank so that the temperature of the bituminous material may be determined at all times.

#### 1.6.3 Brooms and Blowers

Brooms and blowers shall be of the power type and suitable for cleaning prepared subgrades or bases.

### PART 2 PRODUCTS

#### 2.1 BITUMINOUS MATERIAL

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NOTE: Delete all materials, designations and grades not applicable to or suitable for the project. In selecting alternate materials, consider the cost effect of competition between materials along with engineering considerations. In some states and localities, the use of cutback asphalt is prohibited or curtailed by local air pollution regulations. Cutback asphalt is also restricted in areas where there are water quality control restrictions. In areas where cutback asphalt is restricted by air pollution regulations or water quality control restrictions, emulsified asphalt should be used.  
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##### 2.1.1 Cutback Asphalt

[ASTM D 2026, Grade SC-70] [ASTM D 2027, Grade [MC-30] [MC-70]] [ASTM D 2028, Grade RC-70].

##### 2.1.2 Emulsified Asphalt

[ASTM D 977, Type [SS-1] [SS1h]] [ASTM D 2397, Type [CSS-1] [CSS-1h]].

### PART 3 EXECUTION

#### 3.1 SURFACE PREPARATION

Immediately before applying the prime coat, remove loose material, dirt, clay, and other objectionable material from the surface to be primed. After the cleaning operation and prior to the application of the prime coat, examine the area to be primed. Ensure that the area is fit to receive the bituminous priming material.

### 3.2 APPLICATION

Immediately following the surface preparation, apply the bituminous material by means of the bituminous distributor. Apply the bituminous material at a pressure range of 172.4 to 517.1 kPa 25 to 75 pounds per square inch within the temperature limits specified herein, and at the rate of not less than [0.91] [\_\_\_\_\_] liter nor more than [1.36] [\_\_\_\_\_] liters of bituminous material per square meter [0.20] [\_\_\_\_\_] gallon nor more than [0.30] [\_\_\_\_\_] gallon of bituminous material per square yard. Apply the bituminous material so that uniform distribution is obtained over the entire surface to be treated. Unless the distributor is equipped to obtain satisfactory results at the junction of previous and subsequent applications, spread building paper on the surface of the applied material for a sufficient distance back from the ends of each application, so that flow from the sprays may be started and stopped on the paper, and so that all sprayers will operate at full force on the surface to be treated. Immediately after the application, remove the building paper and apply bituminous material to spots missed by the distributor.

#### 3.2.1 Curing

Following the application of bituminous material, allow the surface to cure without being disturbed for a period of not less than 48 hours or longer, as may be necessary to attain penetration into the foundation course and evaporation of the volatiles from the bituminous material. Furnish and spread enough sand to effectively blot up and cure excess bituminous material. Maintain the primed surface until the succeeding layer of pavement is placed, by protecting the surface against damage and by repairing and repriming deficient areas.

#### 3.2.2 Application Temperature for Cutback Asphalt

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**NOTE: Application temperatures for cutback asphalt shall be within the following ranges, except that appropriate changes shall be made when the range of viscosity is raised or lowered:**

MC-30, 29-68 degrees C; RC-70, 49-88 degrees C;  
MC-70, 49-88 degrees C; SC-70, 49-88 degrees C.  
MC-30, 85-155 degrees F; RC-70, 120-190 degrees F;  
MC-70, 120-190 degrees F; SC-70, 120-190 degrees F.

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[As directed] [Between [\_\_\_\_\_] and [\_\_\_\_\_] degrees C] [Between [\_\_\_\_\_] and [\_\_\_\_\_] degrees F] and provide an application viscosity between 0.00004 and 0.00012 square meter per second 40 and 120 centistokes, kinematic, or 20 and 60 seconds, Saybolt Furol.

#### 3.2.3 Application Temperature for Emulsified Asphalt

Between 23.9 and 54.4 degrees C 75 and 130 degrees F.

### 3.3 FIELD QUALITY CONTROL

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**NOTE: When certified laboratory tests would be adequate to ensure the quality of bituminous materials, use paragraph entitled "Test Reports" and delete this paragraph. Where the possibility of**

contamination exists, retain this paragraph.

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Furnish samples of bituminous materials for testing. Sample bituminous materials in accordance with ASTM D 140.

#### 3.4 PROTECTION

Keep traffic off surfaces freshly treated with bituminous material. Provide sufficient warning signs and barricades to prevent traffic over freshly treated surfaces.

-- End of Section --