

PART IV—SURFACE COURSES

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Section 401

Aggregate Surface Course

401.01 DESCRIPTION. Furnish and construct aggregate surface courses for roadways, shoulders, drives, or other facilities in accordance with these specifications, and in conformity with the lines, grades, thicknesses, and typical sections shown on the plans or already established.

401.02 MATERIALS. Furnish materials complying with the following subsections.

Stone	1003.01 & 1003.05.1
Sand-Clay-Gravel (Lime Treated)	1003.01 & 1003.05.2
Reclaimed Portland Cement Concrete	1003.01.3.1 & 1003.05.1
Reclaimed Asphalt Pavement	1003.01.3.2 & 1003.05.3
Water	1018.01
Lime	1018.02

Use uniformly blended aggregate surface course materials that have been sampled and approved prior to placement.

Unless otherwise approved in writing, use the same type material throughout the project.

401.03 EQUIPMENT. Furnish and maintain equipment necessary to produce a finished product meeting the requirements of these specifications. Obtain approval of equipment prior to use.

401.04 CONSTRUCTION

401.04.1 General: Obtain approval of the subgrade before placing aggregate surface course. Uniformly spread material removed from shoulders adjacent to the shoulder material.

On existing surfaces, where only placing aggregate surface course, remove vegetation, shape, and satisfactorily compact the surface prior to placing aggregate surfacing. For new or reconstructed surfaces construct subgrade in accordance with Section 203.

401.05 PLACING MATERIALS. Place material directly on the prepared and approved subgrade. Do not place surface course on damaged subgrade until repairs conforming to 401.04 have been completed and approved.

Do not place or spread aggregate surfacing materials on adjacent portland cement concrete or asphalt concrete pavements. Conduct aggregate surfacing operations so that pavement surfaces, edges, and joints are not damaged. Repairs to damaged areas shall be at no expense to the Department.

401.06 MIXING. Uniformly mix sand-clay-gravel with 6 percent lime by volume; for central mixing, use 5 percent lime. The sand-clay-gravel shall be sampled and approved prior to treatment with lime.

Add moisture to adequately control compaction.

401.07 SHAPING AND COMPACTING AGGREGATE SURFACE COURSE

401.07.1 General: Place material to required thickness, shape to the required section, and compact with an approved roller to a tight, uniform surface free from ruts and waves.

401.07.2 Stone and Recycled Portland Cement Concrete: After initial compaction, wet the surface as directed.

401.07.3 Reclaimed Asphalt Pavement: Compact with at least three passes of a roller approved by the Project Engineer.

401.07.4 Lime Treated Sand-Clay-Gravel: Compact and finish lime treated sand-clay-gravel within 72 hours after initial mixing with lime. If not compacted and finished within 72 hours, due to contractor's operations, recut lime at half the specified rate at no additional cost to the Department.

401.08 DIMENSIONAL TOLERANCES. When specifying net section measurement, the thickness and width of completed aggregate surface course will be checked for acceptance in accordance with DOTD TR 602. Correct to plan dimensions areas with deficiencies in excess of the following tolerances as required at no additional cost to the department.

401.08.1 Thickness: Under-thickness shall not exceed 3/4 inch. Over-thickness may be waived at no additional cost to the Department.

401.08.2 Width: Under-widths shall not exceed 3 inches for shoulders and 6 inches for roadways. Over-width may be waived at no additional cost to the Department.

When using vehicular measurement, the engineer will take measurements to ensure the work's conformance to plan dimensions.

401.09 MEASUREMENT.

401.09.1 Net Section: The quantities of aggregate surface course for payment will be the design volumes as shown on the plans and adjustments thereto. Base design quantities on the horizontal dimensions and the compacted thickness of the completed aggregate surface course shown on the plans. Design quantities will be adjusted if the engineer makes changes to adjust to field conditions, plan errors are proven, or design changes are necessary.

401.09.2 Adjusted Vehicular Measurement: Surface course material will be measured at the point of delivery by the cubic yard in approved hauling vehicles in accordance with 109.01.

Materials delivered by volume will be measured by the cubic yard in hauling vehicles and divided by the factors in Table 401-1 to determine the pay volume:

**Table 401-1
Adjusted Vehicular Measurement
(Materials Delivered by Volume)**

Material	Factor
Stone	1.30
Lime Treated Sand-Clay-Gravel	1.30
Recycled Portland Cement Concrete	1.30
Reclaimed Asphalt Pavement	1.50

Materials delivered by weight will be measured by the ton (2000 pounds) in hauling vehicles and divided by the factors in Table 401-2 to determine the pay volume:

**Table 401-2
Adjusted Vehicular Measurement
[Materials Delivered by Weight]**

Material	Tons to Cubic Yards, Factor
Limestone	1.95
Sandstone	1.82
Porous Limestone	1.76
Lime Treated Sand-Clay-Gravel	1.89
Recycled Portland Cement Concrete	1.82
Reclaimed Asphalt Pavement	1.80

401.10 PAYMENT. Payment for aggregate surface course will be made at the contract unit price per cubic yard, which includes preparation of existing roadways and shoulders, and furnishing, placing, and compacting required aggregate materials, water, and lime.

Payment will be made under:

Item No.	Pay Item	Pay Unit
401-01	Aggregate Surface Course (Net Section)	Cubic Yard
401-02	Aggregate Surface Course (Adjusted Vehicular Measurement)	Cubic Yard

Section 402

Traffic Maintenance Surfacing

402.01 DESCRIPTION. Furnish and construct surfacing for maintenance of traffic on driveways, pipe crossings, short-term traffic on raw embankment, slope corrections, or other disturbed roadway sections as directed and in accordance with the following requirements.

402.02 MATERIALS. Furnish any of the following types of materials complying with the following sections and subsections and in accordance with the following requirements. Other materials must be approved in advance by the engineer.

Stone	1003.01 & 1003.05.1
Recycled Portland Cement Concrete	1003.01.3.1 & 1003.05.1
Reclaimed Asphalt Pavement	1003.01.3.2 & 1003.05.3
Asphalt Concrete ¹	502
Flowable Fill ²	710

¹ All asphalt mixes in Section 502 will be allowed for surfacing materials.

² Flowable fill surface shall meet the excavatable requirements of Table 710-1.

402.03 EQUIPMENT. Furnish and maintain equipment necessary to produce a finished product meeting the requirements of these specifications. Obtain approval of equipment prior to use.

402.04 CONSTRUCTION REQUIREMENTS. Satisfactorily place, shape, compact, and maintain areas requiring traffic maintenance surfacing. When directed, reuse the aggregate material at adjacent locations when the material can be reasonably shifted by blading. When directed, material shall be loaded, hauled, and reused. Unless otherwise directed by the project engineer, remove and dispose of traffic maintenance surfacing when no longer necessary. Dispose in accordance with Section 202.

402.04.1 Mainline Surfacing: For mainline roadway, use traffic maintenance surfaces in accordance with Table 402-1 at the posted speed limit during construction. Aggregate surface is allowed only when all

aggregate table criteria are met. Hard surface is required when any hard surface table criteria is met.

Hard surface will be either asphalt concrete or excavatable flowable fill with a minimum thickness of 6 inches. Surfacing shall be uniform and smooth. Surfacing shall meet a 1/2 inch longitudinal tolerance with a 10-foot static straight edge and shall properly drain. Asphalt concrete surfaces shall have a minimum of 89 percent of maximum dry density.

Should a contractor’s operation or sequence of construction extend the time an aggregate surface remains in place under traffic beyond four weeks, hard surfacing will be at no additional pay.

Should a contractor’s operation or sequence of construction necessitate the use of aggregate in areas requiring hard surface, place the hard surface within 48 hours. Placement of aggregate surfacing in this case will be at no direct pay.

402.04.2 Non-Mainline Surfacing: Use either aggregate or hard surfacing for turnouts, drives, crossovers and other non-mainline segments of roadway. If using hard surfacing, it shall meet the requirements of 402.04.1.

**Table 402-1
Mainline Traffic Maintenance Criteria**

Surface Type	ADT	Posted Speed, mph	Time Surfacing to Remain In Place Under Traffic
Aggregate	≤5000	≤45	≤4 weeks ¹
Hard Surface	>5000	>45	>4 weeks

¹ Time may be extended with approval of the Project Engineer.

402.05 MEASUREMENT. Aggregate used for traffic maintenance surfacing will be measured at the point of delivery by the cubic yard in approved hauling vehicles in accordance with 109.01. No adjustment factor will be used.

Hard surfacing will be measured by the square yard at the roadway location.

402.06 PAYMENT. Payment for traffic maintenance surfacing, maintained and subsequently removed, when required, will be made at the contract unit prices per cubic yard or per square yard.

Aggregate materials reused by blading to adjacent locations will be at no expense to the Department. Aggregate material reloaded, hauled, and re-used will be paid at 50 percent of the contract unit price.

Payment will be made under:

Item No.	Pay Item	Pay Unit
402-01	Mainline Traffic Maintenance Surfacing (Aggregate) (Vehicular Measurement)	Cubic Yard
402-02	Mainline Traffic Maintenance Surfacing (Hard)	Square Yard
402-03	Non-Mainline Traffic Maintenance Surfacing (Aggregate) (Vehicular Measurement)	Cubic Yard