

## PART IV -- SURFACE COURSES

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## **Section 401 Aggregate Surface Course**

**401.01 DESCRIPTION.** This work consists of furnishing and constructing aggregate surface courses for 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 established.

**401.02 MATERIALS.** The contractor has the option of furnishing any one of the following types of aggregate surface course materials complying with the following Subsections.

Stone	1003.01 & 1003.04(a)
Sand-Clay-Gravel (Lime Treated)	1003.01 & 1003.04(b)
Recycled Portland Cement Concrete	1003.01 & 1003.04(c)
Reclaimed Asphaltic Pavement	1003.01 & 1003.04(d)
Crushed Slag	1003.01 & 1003.04(e)
Water	1018.01
Lime	1018.03

Aggregate surface course materials shall be a uniform blend, sampled in dedicated stockpiles and approved prior to placement.

Unless otherwise approved in writing, the same type material shall be used throughout the project.

**401.03 EQUIPMENT.** Equipment necessary to produce a finished product meeting specification requirements shall be furnished and maintained by the contractor. Equipment will be approved prior to use.

### **401.04 SHOULDER CONSTRUCTION.**

**(a) General:** The subgrade shall be approved before aggregate surface course is placed. Material removed from shoulders shall be uniformly spread adjacent to the shoulder material.

**(b) Existing Shoulders:** On existing shoulders, where only aggregate surface course is to be placed, vegetation shall be removed and the shoulders shaped and satisfactorily compacted prior to placing aggregate surfacing. For reconstructed shoulders, the top layer under the

subgrade shall be a usable soil complying with Subsection 203.06 and shall be compacted to a minimum of 95.0 percent of maximum dry density. Maximum dry density will be determined in accordance with DOTD TR 415 or DOTD TR 418 and percent in-place density in accordance with DOTD TR 401.

**(c) New Shoulders:** For new shoulders, the top layer under the subgrade shall be a usable soil complying with Subsection 203.06 and shall be compacted to a minimum of 95.0 percent of maximum dry density. Maximum dry density will be determined in accordance with DOTD TR 415 or DOTD TR 418 and percent in-place density in accordance with DOTD TR 401.

**401.05 PLACING MATERIALS.** The material shall be placed directly on the prepared and approved subgrade from hauling vehicles or spreading equipment. No surface course shall be placed on damaged subgrade until repairs conforming to Subsection 401.04 have been completed and approved.

Aggregate surfacing materials shall not be placed or spread on adjacent portland cement concrete or asphaltic concrete pavements. Aggregate surfacing operations shall be conducted so that pavement surfaces, edges, and joints are not damaged.

**401.06 MIXING.** Sand-clay-gravel shall be uniformly mixed with 6 percent lime by volume, except that for central mixing, 5 percent lime will be used. The sand-clay-gravel shall be sampled and approved prior to treatment with lime.

Adequate moisture shall be added to control compaction.

#### **401.07 SHAPING AND COMPACTING AGGREGATE SURFACE COURSE.**

**(a) General:** The material shall be shaped by suitable means and compacted. Shaping and compacting shall continue until the surface conforms to the required sections and is free from ruts and waves.

**(b) Aggregate Surfacing:** Aggregate surfacing shall be compacted to the satisfaction of the engineer by approved methods. After initial compaction, the surface shall be wetted as necessary and rolled with a pneumatic-tire or steel-wheel roller to a tight, uniform surface.

**(c) Reclaimed Asphaltic Pavement:** Reclaimed asphaltic material shall be placed to required thickness, shaped to the required

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section, and compacted with at least three passes by an approved pneumatic-tire roller to a tight, uniform surface.

**(d) Lime Treated Materials:** Finishing and compacting of lime treated materials shall be completed within 72 hours after initial mixing with lime.

**401.08 DIMENSIONAL TOLERANCES.** When net section measurement is specified, the thickness and width of completed aggregate surface course will be checked for acceptance in accordance with DOTD TR 602. Areas with thickness and width deficiencies in excess of the following tolerances shall be corrected to plan dimensions by furnishing, placing, reworking, shaping, and compacting additional materials as required at no direct pay.

**(a) Thickness:** Underthickness shall not exceed 3/4 inch (20 mm). Overthickness may be waived at no additional cost to the Department.

**(b) Width:** Underwidth on shoulders shall not exceed 3 inches (75 mm). Overwidth may be waived at no additional cost to the Department.

When vehicular measurement is used, no DOTD TR 602 measurements will be made. The engineer will take measurements to ensure the work's conformance to plan dimensions.

## 401.09 MEASUREMENT.

**(a) Net Section:** The quantities of aggregate surface course for payment will be the design volumes as specified in the plans and adjustments thereto. Design quantities are based 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, if plan errors are proven, or if design changes are necessary.

**(b) Adjusted Vehicular Measurement:** Surface course material will be measured by the cubic yard (cu m) in approved hauling vehicles at the point of delivery in accordance with Subsection 109.01.

Materials delivered by volume will be measured by the cubic yard (cu m) in hauling vehicles and divided by the following factors to determine the pay volume:

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

Material	Factor
Stone or Crushed Slag	1.30
Lime Treated Sand-Clay-Gravel	1.30
Recycled Portland Cement Concrete	1.30
Reclaimed Asphaltic Pavement	1.50

Materials delivered by weight (mass) will be measured by the ton (2,000 pounds) [Mg (1,000 kg)] in hauling vehicles and divided by the following factors to determine the pay volume:

**Table 401-2  
Adjusted Vehicular Measurement (Materials Delivered by Weight (Mass))**

Material	Tons to Cubic Yards, Factor	Megagrams to Cubic Meters, Factor
Limestone	1.95	2.34
Sandstone	1.82	2.15
Porous Limestone	1.76	2.08
Lime Treated Sand-Clay-Gravel	1.89	2.21
Recycled Portland Cement Concrete	1.82	2.15
Reclaimed Asphaltic Pavement	1.80	2.10

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

Payment will be made under:

<b>Item No.</b>	<b>Pay Item</b>	<b>Pay Unit</b>
401-01	Aggregate Surface Course (Net Section)	Cubic Yard (Cu m)
401-02	Aggregate Surface Course (Adjusted Vehicular Measurement)	Cubic Yard (Cu m)

## **Section 402**

### **Traffic Maintenance Aggregate**

**402.01 DESCRIPTION.** This work consists of furnishing and constructing aggregate surfacing for maintenance of traffic as directed and in accordance with the following requirements.

**402.02 MATERIALS.** Aggregate for maintenance of traffic shall be stone, wash gravel, recycled portland cement concrete, or reclaimed asphaltic pavement (RAP) satisfactory to the engineer.

**402.03 EQUIPMENT.** Equipment, necessary to produce a finished product meeting specification requirements shall be furnished and maintained by the contractor.

**402.04 CONSTRUCTION REQUIREMENTS.** The contractor shall satisfactorily place, shape, compact and maintain areas requiring traffic maintenance aggregate. When directed, the aggregate material shall be reused at adjacent locations when the material can be reasonably shifted by blading at no direct pay. When directed, material shall be loaded, hauled and re-used and paid at 50 percent of the contract unit price. Unless otherwise allowed by the project engineer, aggregate surfacing no longer necessary for maintenance of traffic shall be removed and disposed of in accordance with Section 202.

**402.05 MEASUREMENT.** Traffic maintenance aggregate will be measured by the cubic yard (cu m) in approved hauling vehicles at the point of delivery in accordance with Subsection 109.01. No adjustment factor will be used.

**402.06 PAYMENT.** Payment for traffic maintenance aggregate maintained and subsequently removed (when required) will be made at the contract unit price under:

<b>Item No.</b>	<b>Pay Item</b>	<b>Pay Unit</b>
402-01	Traffic Maintenance Aggregate (Vehicular Measurement)	Cubic Yard (Cu m)

## **Section 403 Aggregate Roadway Surfacing**

**403.01 DESCRIPTION.** This work consists of furnishing and constructing aggregate roadway surfacing in accordance with plan details and the following requirements.

**403.02 MATERIALS.** Aggregate surfacing material shall be gravel conforming to Subsection 1003.08(c)(1) or stone or recycled portland cement concrete conforming to Subsection 1003.04.

**403.03 EQUIPMENT.** Equipment, necessary to produce a finished product meeting specification requirements shall be furnished and maintained by the contractor.

**403.04 CONSTRUCTION REQUIREMENTS.** The subgrade shall be prepared as provided in Section 203 and shall be approved before surfacing material is placed. After placement of aggregate surfacing, the aggregate shall be blended with the top two inches (50 mm) of the subgrade materials by blade mixing or other approved methods.

Surface course material shall be satisfactorily shaped and compacted. Shaping and compacting shall continue until the surface conforms to the required section and is free from ruts and waves.

**403.05 MEASUREMENT.** Aggregate surfacing will be measured by the cubic yard (cu m) in approved hauling vehicles at the point of delivery in accordance with Subsection 109.01.

**403.06 PAYMENT.** Payment will be made at the contract unit price under:

<b>Item No.</b>	<b>Pay Item</b>	<b>Pay Unit</b>
403-01	Aggregate Roadway Surfacing (Vehicular Measurement)	Cubic Yard (Cu m)

