




To: <b>SUPERSEDED BY EB 21-057</b> <b>EFFECTIVE 11/24/21</b>		New York State Department of Transportation <b>ENGINEERING</b> <b>INSTRUCTION</b>	<b>EI</b> <b>02-027</b>
Title: <b>Shoulder Backup Material</b>			
Distribution: <input type="checkbox"/> Manufacturers (18) <input type="checkbox"/> Surveyors (33) <input checked="" type="checkbox"/> Main Office (30) <input checked="" type="checkbox"/> Consultants (34) <input checked="" type="checkbox"/> Local Govt. (31) <input checked="" type="checkbox"/> Contractors (39) <input checked="" type="checkbox"/> Regions/Agencies (32) <input type="checkbox"/> ( )	Approved:  Philip Clark, Deputy Chief Engineer Design <div style="text-align: right;">           Date       </div>		

**Administrative Information:**

- **Effective Date:** This Engineering Instruction (EI) is effective with the letting of January 16, 2003.
- **Superseded Issuances:** It supersedes EI 01-021 "Shoulder Backup Material" and disapproves the special specification, Item 15203.23 "Shoulder Backup Material" which was issued under that EI and also disapproves Item 02304.0501 "Shoulder Backup Material", which was missed during the work-up of EI 01-021.
- **Disposition of Issued Materials:** Ultimately, the contents of this EI will be incorporated into the *Standard Specifications*. The *Highway Design Manual (HDM)* already contains design policy information on backing up shoulders.

**Purpose.** The purpose of this EI is to replace Item 02304.0501 "Shoulder Backup Material" and Item 15203.23 "Shoulder Backup Material" (the special specification issued under EI 01-021) and to supersede EI 01-021.

**Implementation:**

**Design Quality Assurance Bureau.** The transmitted special specification, Item 15203.24 "Shoulder Backup Material" replaces and supersedes Item 15203.23 "Shoulder Backup Material". DQAB will enter the item into the computer as a generally approved item and insert the item into proposals calling for its use.

**Designers.** Designers should include Item 15203.24 "Shoulder Backup Material" when this material is required by the project. Suitable projects would include 3R and resurfacing projects. Shoulder drop-offs greater than 50 mm should be backed up using either this material or one of the volume based standard items from the *Standard Specifications*.

Shoulder backup material is a sound and stable material. It is able to accommodate, without shoving or rutting, the occasional wheel load from an errant vehicle that leaves the paved shoulder. Designers should not, however, use shoulder backup material as a substitute for Item 203.03 "Embankment in Place" in situations where "Embankment in Place" would be the better choice. Particular situations where this might be the case include the following:

- In areas where the new shoulder is to be constructed wider than the existing shoulder;
- In areas where mowing strips will extend beyond the existing shoulder;
- In areas where offset distance from the back of guide rail posts to the shoulder break must be increased;
- In areas where there is to be new pavement or pavement widening;
- In areas where drainage ditches may become blocked by the material

If the usage pattern is not overly complex, designers should indicate clearly on the Typical Sections where the backup material is to be used. If the usage pattern is too complex for depiction on the typical sections, designers should indicate in tabular form where the item is to be used and how the quantities were developed.

Because the materials permitted under the transmitted item are gravels or broken stones, and therefore may not be appropriate in residential areas, ordinary Topsoil and Turf reestablishment items should be considered in these locations. Driveway radii in all areas should be sufficient so that turning traffic uses the driveway pavement and that the driveway edge needs no special support. Thus, most driveways, being in residential lawn areas, will be satisfactorily "backed up" using topsoil and turf establishment items. Those driveways in other locations may be appropriate locations

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for the transmitted item.

Because the specification will allow the contractor to choose among the various types, if a particular type or types of material is desired to the exclusion of the other optional materials, it will be necessary to indicate this on the plans. Use a note on the Typical Sections, a note in the general notes section of the plans, or a prominently placed note in the proposal in "no-plans" projects to exclude one or more of the optional types of materials.

**Transmitted Material.** This engineering instruction transmits the main office insert special specification Item 15203.24 "Shoulder Backup Material".

**Background and Abstract.** Shoulder backup material is placed along the edges of newly paved shoulders in resurfacing projects to reduce or eliminate the drop-off that occurs there. Formerly there were pay items that measured this work in linear meters, cubic meters loose measure, and in metric tons. A number of these were disapproved under EI 01-021. One overlooked item for shoulder backup material is replaced hereby. Contractors had indicated that it is difficult to estimate the cost of shoulder backup when it is measured in linear measure, and that a fairer, better unit of measure would be either volume or weight (mass). The transmitted special specification, Item 15203.24 replaces the pay item transmitted under EI 01-021 and the overlooked Item 02304.0501. This pay item provides for measurement in metric tons, but because sometimes there will be no scales close enough to be of practical use, conversion factors between cubic meters, loose measure and metric tons are provided. The engineering instruction advises that shoulder drop-offs greater than 50 mm on resurfacing or 3R projects are candidates for the shoulder backup item. It also provides a number of situations where other items, especially the items for Embankment-in-Place and turf establishment, should be used.

The primary reasons for revising item 15203.23 are that the Geotechnical Engineers objected to its stockpile provisions and requirements that materials come from "approved sources." Other objections addressed hereby include obtaining crusher-run from asphalt concrete pavements, and the top size of one of the options allowed under Type A.

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## ITEM 15203.24 M - SHOULDER BACKUP MATERIAL

### DESCRIPTION:

This work shall consist of furnishing, placing, grading, compacting, and trimming shoulder backup material of the type indicated adjacent to shoulders to the lines, grades, and locations indicated in the contract documents or to the lines, grades, and locations directed by the Engineer, in accordance with these specifications and details shown in the plans.

### MATERIALS:

**General.** Except as indicated below, §304-2 shall apply. Where the term "subbase course" is used in that subsection, "shoulder backup material" shall replace it.

Material incorporated into the work need not be stockpiled. The State may test for plasticity, soundness, and gradation at its discretion, or may decide not to test for these properties. Materials incorporated into the work shall consist of uncontaminated materials, free of glass, conforming with these specifications, the contract documents, and the directions of the Engineer.

Unless indicated otherwise in the contract documents, the Contractor may choose the type or types of material to use from the list of types given below. Intermixing of the permitted types, however, will be subject to the approval of the Engineer.

Material that proves to be, or that is determined by the Engineer to be impractical to place, grade, trim or compact as shown in the contract documents or as directed by the Engineer shall not be used.

**Type A (Crusher-run, crushed gravel, or crushed stone.)** Shoulder backup material of this type shall consist of well graded crusher-run material from a stone quarry or gravel source, or crushed Portland cement concrete. The material shall contain no organic, deleterious, hazardous or toxic material. Gradation shall be subject to the approval of the Engineer, but no material larger than 25 mm in greatest dimension will be allowed. Materials shall not show losses greater than 20% after four cycles of the Magnesium Sulfate Soundness test.

**Type B (Subbase Course, Type 2.)** Shoulder backup material of this type shall meet the material requirements of Subbase Course, Type 2. The Regional Geotechnical Engineer will examine each proposed source of material for compliance with these specification requirements, and submit an evaluation of the material including any limiting conditions to the Engineer.

**Type C (Subbase Course, Type 4.)** Shoulder backup material of this type shall meet the material requirements of Subbase Course, Type 4 of the Standard Specifications, except the material furnished shall consist of sand and gravel or a blend of sand and gravel and stone. The Regional Geotechnical Engineer will examine each proposed source of material for compliance with these specification requirements, and submit an evaluation of the material including any limiting conditions to the Engineer.

**Type D (Recycled Asphalt Concrete.)** Material provided under this option shall consist of uncontaminated recycled asphalt concrete pavement produced on the contract or from other sources as approved by the Engineer. Recycled asphalt concrete pavement shall be broken down into sizes no larger than 40 mm.

**Type E (Select Structural or Granular Fill.)** Material provided under this option shall consist of material conforming to the soundness, gradation, and pH requirements for Select Structural Fill or Select Granular Fill, except top size shall not exceed that for Type C.

## **ITEM 15203.24 M - SHOULDER BACKUP MATERIAL**

### **CONSTRUCTION DETAILS:**

The material shall be placed on the grade in a manner to minimize segregation using equipment and procedures approved by the Engineer. Uncontrolled spreading from piles dumped on the grade resulting in segregation will not be permitted. Maximum loose lift thickness prior to compaction shall be 150 mm. The contractor's compaction methods and equipment shall be approved by the Engineer. After compaction, the finished surface of the compacted material at the shoulder edge shall not extend above the edge of the shoulder nor be more than 10 mm below the shoulder. Tolerance elsewhere shall be  $\pm 40$  mm, except the surface shall be graded to drain at every location.

If the final grade of the material is not in reasonable close conformity to the lines and grades indicated in the contract documents, or to those directed by the Engineer, the material shall be trimmed to achieve reasonably close conformance. Additional material shall be brought in to fill deficiencies, and excess material (trimmings) shall be removed. Trimmings may be incorporated into the shoulder backup work at other locations along the project if such opportunities exist and provided gradation of the resulting material remains in conformance with the gradation requirement for the selected option. When it is not possible to incorporate the trimmings in the shoulder backup work the trimmings shall be disposed of or used elsewhere in the contract in a manner approved by the Engineer.

### **METHOD OF MEASUREMENT:**

Shoulder Backup Material will be measured for payment as the number of metric tons evidenced by delivery tickets, properly placed, graded, compacted, and trimmed along the edge of shoulder in accordance with these specifications and the directions of the Engineer.

When truck scales are not available within reasonable distance of the source of the material, as determined by the Engineer, the quantity paid for will be determined using conversion factors and the loose volume of shoulder backup material determined by measuring the dump truck bodies. The Contractor shall select the trucks to be used for delivery of the material with the approval of the Engineer. Once the trucks are selected and approved by the Engineer, no other trucks shall be used for delivery of this material. The trucks shall be uniformly loaded to the satisfaction of the Engineer.

Additional material brought in as part of the trimming operation to fill deficiencies will be measured for payment. The quantity of trimmings removed from the shoulder backup operation and not incorporated into the shoulder backup work elsewhere, however, will not be measured for payment under this pay item, and the Engineer will make an appropriate adjustment to the measured quantity.

Unless other conversion factors are indicated in the Contract Documents, the conversion factor shall be 1.68 metric tons per cubic meter, loose measure.

### **BASIS OF PAYMENT:**

The unit price bid per metric ton for Shoulder Backup Material shall include the cost of all labor, materials, and equipment necessary to satisfactorily furnish, place, grade, compact, and trim Shoulder Backup Material.