To:		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 01-021
SUPERSEDED BY EI 02-027 EFFECTIVE 1/16/03			
Title: **Shoulder Backup Material**			
Distribution: ☐ Manufacturers (18) ☒ Main Office (30) ☒ Local Govt. (31) ☒ Regions/Agencies (32) ☐ Surveyors (33) ☒ Consultants (34) ☒ Contractors (39) ☐ _____( )	Approved: Philip J. Clark, Deputy Chief Engineer Design 08/28/01 Date		

Administrative information. This engineering instruction becomes effective with the letting of January 10, 2002. Designers wishing to use the specification in earlier contracts may do so, but should include a copy of the specification in the PS & E. This engineering instruction does not supersede any existing engineering instructions or bulletins. It does disapprove the special specifications listed below. Ultimately its contents will be incorporated into the *Standard Specifications*. The *Highway Design Manual* already contains design policy information on backing up shoulders.

Purpose. The purpose of this engineering instruction is to replace a number of regional special specifications with a main office insert specification in which the unit of measurement is metric tons. This instruction also establishes a policy that metric tons be the standard unit of measure for this kind of work.

Implementation:

Design Quality Assurance Bureau. The attached special specification, 15203.23 Shoulder Backup Material will be a main office insert. DQAB will also disapprove the following regional special specifications:

01203.0309 02203.0501 02304.0502 03623.8701 03623.8702 04203.0307
05203.1407 05203.1408 05203.1409 06303.87 08203.520301 09203.03
63203.030901 63203.030902.

The disapproval date will be the effective date of this engineering instruction.

Designers. Designers should include Item 15203.23 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 volume based standard items from the *Standard Specifications*.

Shoulder backup material must be a sound and stable material. It must be 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 stone, 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 that the driveway edge needs no special support. Most driveways, being in lawn areas, will be "backed up" using topsoil and turf establishment items. Those in other locations

may be appropriate locations 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 to exclude one or more of the optional types of materials. A special specification patterned after the transmitted specification should be written in preference to a note in the Proposal.

Transmitted material. This engineering instruction transmits main office insert special specification 15203.23 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. Presently there are pay items that measure this work in linear meters, cubic meters loose measure, and in metric tons. Contractors have indicated that it is difficult to estimate the cost of this item 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 provides for measurement in metric tons, but reflecting the reality that often 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 Embankment in Place, should be used .

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ITEM 15203.23 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. §304-2, including the provisions for stockpiling, shall apply. Where the term "subbase course" is used in that subsection, "shoulder backup material" shall replace it. Materials incorporated into the work shall consist of uncontaminated materials conforming with these specifications, the contract documents, and the directions of the Engineer. Unless indicated otherwise, the Contractor may choose the type or types of material to use. 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, 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 an approved stone or gravel quarry source, Portland cement concrete, or asphalt concrete. The material shall contain no organic, deleterious, hazardous or toxic material. Gradation shall be subject to the approval of the Engineer, however no material larger than 25 mm in greatest dimension will be allowed.

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 visually inspect each proposed source of material for compliance with these specification requirements, and submit an evaluation of the material in writing including any limiting conditions to the Engineer-In-Charge.

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 approved sand and gravel or a blend of sand and gravel and stone. The Regional Soils Engineer will visually inspect each proposed source of material for compliance with specification requirements, and submit an evaluation of the material in writing including any limiting conditions to the Engineer-In-Charge.

Type D (Asphalt Concrete Millings.) Material provide under this option shall consist of uncontaminated asphalt concrete millings produced on the contract or from other sources approved by the Engineer. Milling waste shall be broken down into sizes no larger than 40 mm.

CONSTRUCTION DETAILS:

Shoulder backup material shall be furnished, placed, graded, compacted, and trimmed to the lines and grades shown in the contract documents, or to those directed by the Engineer. The provisions of §304-1 Construction Details of Section 304, Subbase Course shall apply.

METHOD OF MEASUREMENT:

Shoulder Backup Material will be measured for payment as the number of metric tons, properly placed, graded, compacted, and trimmed along the edge of shoulder in accordance with the details shown on the plans or as directed by the Engineer.

When truck scales are not available within reasonable distance of the stockpile, 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.

Conversion factors 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.