MODIFIED BY EI 05-021
EFFECTIVE 1/12/06

SUPERSEDED BY EB 06-057 EFFECTIVE 5/3/07

MODIFIED BY EI 06-004 EFFECTIVE 9/7/06

To:

New York State Department of Transportation

ENGINEERING INSTRUCTION

EI 02-037

Title: STANDARD SPECIFICATIONS
SECTION 209 - SOIL EROSION AND SEDIMENT CONTROL
SECTION 612 - SODDING

Distribution:
- ☐ Manufacturers (18)
- ☒ Main Office (30)
- ☒ Local Govt. (31)
- ☒ Regions/Agencies (32)
- ☐ Surveyors (33)
- ☒ Consultants (34)
- ☒ Contractors (39)

Approved:

P.J. Clark, Deputy Chief Engineer, Design — Date: 11/01/02

ADMINISTRATIVE INFORMATION

- **Effective Date.** This Engineering Instruction (EI) is effective with projects submitted for the letting of 05/08/03.
- **Superseded Issuances.** EI 00-023 Temporary Soil Erosion and Sediment Control Specifications - Revised, and Sections 209 and 612 of the Standard Specifications of January 2, 2002.
- **Disposition of Issued Materials.** The transmitted specifications will reside in the next update to the Standard Specifications.

PURPOSE

This EI issues revisions to Standard Specifications Sections 209 and 612. These revisions clarify the intent of the specification, and are the result of the Department's commitment to continuous improvement.

TECHNICAL INFORMATION

Designer Information - The items provided in Section 209 should be specified consistent with the guidance provided in Section 4.3 of the Environmental Procedures Manual, Chapter 8 Highway Drainage, Section 8.8 of the Highway Design Manual, and other design guidelines (e.g., Volume III of AASHTO's Highway Drainage Guidelines, Chapter 16 of AASHTO's Model Drainage Manual, New York Guidelines For Urban Erosion And Sediment Control, etc.).

The items provided in Section 209 should be used with the standard sheets issued with EB 02-060.

Actions of the Design Quality Assurance Bureau (DQAB) - DQAB will:

- insert the attached shelf notes into contract proposals for projects containing Section 612.xx/Section 209.xx pay items;
- disapprove all items provided in Section 209 and Section 612 **except** Item No. 612.01 of the Standard Specifications of January 2, 2002;
- disapprove item 10209.0510 M - Temporary Silt Dikes and item 01603.96 M Temporary Pipe Slope Drain;
- approve all Section 209 items issued with this EI.

TRANSMITTED MATERIALS

Standard Specification Section 209 - Soil Erosion and Sediment Control.
Standard Specification Section 612 - Sodding.

CONTACT - Direct questions regarding this Engineering Instruction to Gary Glath in the Landscape Architecture Bureau at (518) 457-4460 (e-mail gglath@gw.dot.state.ny.us).

SOIL EROSION AND SEDIMENT CONTROL

Make the following changes to *Volume I of the Standard Specifications of January 2, 2002:*

Page 2-45, line 4, **thru Page 2-52**, line 8; **delete** entirely and replace with the following:

"SECTION 209 - SOIL EROSION AND SEDIMENT CONTROL

209-1 DESCRIPTION. This work shall consist of furnishing, installing, inspecting, maintaining, and removing soil erosion and sediment control measures as shown on the contract documents or as ordered by the Engineer during the life of the contract to provide soil erosion and sediment control. This work shall be coordinated with the soil erosion and sediment control features specified elsewhere in the contract documents to the extent practical to assure effective and continuous soil erosion and sediment control throughout the construction and post construction period.

209-1.01 Erosion Control. See §101-02 Definitions of Terms, Erosion Control, for the definition of Erosion Control. The following items of work are provided in this section to address soil erosion control - mulch, straw/wood fiber mulch, seed and mulch, seed and straw/wood fiber mulch, all classes and types of rolled erosion control products, and soil stabilizers. Other items may be provided in the contract documents to provide soil erosion control (e.g., turf establishment, bank and channel protection, etc.).

209-1.02 Sediment Control. Sediment control is any action taken or item used as part of a project or as a separate action to minimize suspended solid material transport by water. The following items of work are provided in this section to address sediment control - haybale/strawbale, strawbale, sediment trap, turbidity curtain, silt fence.

209-2 MATERIALS. Unless otherwise stated elsewhere in the contract documents, materials shall be as stated herein.

209-2.01 Mulch. Mulch shall be §713-18 Hay, §713-19 Straw, or §713-11Wood Fiber Mulch. Straw/Wood Fiber Mulch shall be §713-19 Straw or §713-11Wood Fiber Mulch.

209-2.02 Seed. Seed shall be ryegrasses (annual or perennial) or cereal grasses suitable to the area and as a temporary cover which will not compete with the grasses sown later for permanent cover.

209-2.03 Stone Filling. Stone filling shall meet the requirements of §620-2.02 Stone Filling, light.

209-2.04 Haybale/Strawbale. Haybale/Strawbale shall meet the requirements of §713-18 Hay or §713-19 Straw. Strawbale shall be §713-19 Straw.

All bales shall be tightly bound; loose or broken bales will not be accepted. Hardwood stakes shall be at least 32 mm x 32 mm and a minimum of 0.6 m long.

209-2.05 Geotextile. Geotextiles shall meet the requirements of §207-2 Materials. UV sensitive geotextiles shall be protected from exposure to sunlight during transport and storage.

209-2.06 Prefabricated Check Dams and Drainage Structure Inlet Protection. The materials used for prefabricated check dams and drainage structure inlet protection shall be triangular-shaped in cross section, and have a height of at least 200 mm - 250 mm in the center with two equal sides and a 450 mm - 600 mm base. The triangular-shaped inner material shall be urethane foam. The outer cover

shall be a woven bedding type geotextile placed around the inner triangle and extend 600 mm - 920 mm beyond each side of the triangle base.

Other materials may be proposed by the Contractor who shall be solely responsible for their performance.

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209-2.07 Turbidity Curtain. Turbidity curtain shall be listed in the Approved List. Turbidity curtain assemblies shall consist of a geotextile, a flotation system that will float if punctured or cut, and a securing and anchoring system. Prefabricated turbidity curtain systems may be used provided that material requirements of this specification are met.

The flotation, anchoring and securing system shall be fabricated to hold the curtain in place, keep the bottom anchored, and shall be as shown in the contract documents.

209-2.08 Silt Fence. Silt fence shall be listed in the Approved List. A silt fence assembly shall consist of silt fence geotextile, posts, and fasteners and may include mesh support consistent with the Approved List.

A. Posts. Posts shall meet the following requirements:

1. Either wood, metal, or synthetic posts may be used. Softwood post shall be 38 mm x 89 mm, hardwood post shall be at least 32 mm x 32 mm, steel post shall be"T" or "L" shaped in cross section, with a minimum weight of 2 kg/m.

2. Posts shall be a minimum of 1.2 m long and shall be spaced consistent with the material selected and as indicated in the Approved List.

B. Mesh Support. For those silt fence assemblies on the Approved List that require a mesh support, the support shall consist of 14 gauge (min) welded wire mesh with a maximum 150 mm x 150 mm opening or polymeric mesh. All mesh support shall be a minimum of 750 mm in height.

C. Fasteners. Fasteners shall be heavy duty staples, hog rings, tie wires, or any other fastener compatible with the post material.

209-2.09 Gravel Bag. Bags shall be fabricated from reinforced woven geotextile and shall include ties. No burlap bags shall be allowed. Coarse aggregate shall meet the gradation requirements of size designation #1 or #2 of Table 703-4 and shall be used as the fill material. Each gravel bag shall be individually tied and double bagged. The bag with fill material shall be inversely inserted into the second bag in order to prevent leakage.

209-2.10 Sand Bag. Sand bags shall meet the requirements of §209-2.09 Gravel Bag except that sand meeting the gradation requirements of §703-06 Cushion Sand shall be used as the fill material.

209-2.11 Pipe Slope Drain. Pipe slope drain materials may consist of new or used material in satisfactory condition and suitable for the intended use. The Engineer will reject used materials determined to be unsatisfactory. Pipe couplings shall be appropriate for the pipe and as recommended by the Manufacturer. End sections may be steel, aluminum, or polyethylene.

209-2.12 Rolled Erosion Control Products and Soil Stabilizers. These materials shall meet the requirements of §713-07 Jute Mesh Or Other Approved Erosion Control Materials and shall be of the Type and Class specified in the contract documents.

209-2.13 Stabilized Construction Entrance. Construction entrances shall consist of a geotextile, crushed stone or gravel and, if necessary, a drainage pipe to maintain ditch flow.

A. Geotextile. Geotextile shall meet the requirements of §207-2 Materials, Geotextile Stabilization, Strength Class 1.

B. Crushed Stone or Gravel. Crushed stone or gravel shall be 150 mm of coarse aggregate material meeting the gradation requirements of size designation #3 on Table 703-4.

C. Drainage Pipe. The Contractor shall provide a drainage pipe sized with sufficient capacity to carry ditch flow. The pipe dimension shall be consistent with the modified soil erosion and sediment control plan approved by the Engineer. The drainage pipe may consist of new or used material in satisfactory condition and suitable for the intended use. The Engineer will reject any materials determined to be unsatisfactory.

209-2.14 Temporary Pipe Inlet/Outlet Protection. The materials used shall be as indicated on the standard sheets.

209-2.15 Temporary Sediment Trap. The materials used shall be as indicated on the standard sheets.

A. Impervious Embankment In Place.

1. The impervious embankment material shall have the following gradation:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
150 mm	90 - 100
19.0 mm	50 -100
4.75 mm	40 - 90
425 µm	30 - 85
75 µm	25 - 75

209-3 CONSTRUCTION DETAILS.

209-3.01 General. In the event of conflict between these specification requirements and pollution control laws, rules, regulations or permit conditions by other federal or state or local government agencies, the more restrictive laws, rules or regulations shall apply.

All work done under this section shall be performed consistent with §107-12 Water Quality Protection and included as part of the construction schedule submitted by the Contractor under §108-01 Start and Progress of Work. The Contractor's schedules and methods shall be consistent with the soil erosion and sediment control plan included in the contract documents or the modified plan approved by the Engineer. The Contractor shall begin earthwork only after receiving written approval from the Engineer for the scheduling of earthwork and work covered under this section.

SOIL EROSION AND SEDIMENT CONTROL

The Contractor shall designate to the Engineer an erosion and sediment control supervisor with adequate training, experience, and authority to implement and maintain all erosion and sediment control measures.

Perimeter sediment controls shall be installed prior to performing grubbing, excavation, and borrow or fill operations. The Contractor shall limit the area of clearing and grubbing, excavation, borrow and embankment operations in progress, commensurate with their capability and progress in keeping the finish grading, mulching, seeding and other temporary and/or permanent control measures current in accordance with the approved schedule. Under no condition shall earth material exposed by grubbing, excavation, borrow or fill or other work be left without application of temporary or permanent erosion controls for a period of greater than 7 days. The Engineer may determine that a potential for erosion or sediment transport exists and order the Contractor to install temporary erosion controls earlier. When permanent soil erosion and sediment control measures can not be installed due to seasonal or other limitations, temporary soil erosion and sediment control measures shall be installed. Prior to removing or disturbing any erosion or sediment control measure that may be required to be reestablished due to continual grading operations, the Contractor shall verify the proposed progression of operations and the reestablishment of control measures with the Engineer to ensure the continuity of erosion and sediment control.

Sediment control measures shall not be removed without the Engineer's approval.

209-3.02 Inspection and Maintenance. Soil erosion and sediment control measures shall be inspected and maintained by the Contractor during the life of the project, including winter shutdown, etc. Such inspection and maintenance shall continue until after the permanent stabilization measures are in place and the temporary control measures are ordered to be removed by the Engineer. The remaining disturbed area shall be permanently stabilized as indicated in the contract documents.

All temporary controls shall be inspected by the Contractor every seven calendar days, after each rainfall of 12 mm or more within a 12 hour period, or daily during prolonged rainfall to determine if the measure is functioning as intended. All inspections shall be completed within one calendar day.

Within 3 calendar days from completion of the inspection, the Contractor shall:

- Repair or rebuild the control measure to function as originally intended.
- Remove sediment deposition which reaches one half the height of the control measure. All sediment deposits shall be considered unsuitable material and disposed of in accordance with §203-3.08, *Disposal of Surplus Excavated Materials*. Material shall be disposed of away from wetlands, water courses or other bodies of water.

Torn or punctured silt fence fabric may be repaired by the placement of a patch, on the upstream side, consisting of an additional layer of fabric over the damaged area, or replacement of the damaged section.

Where erosion control materials have been used on final grade that have been permanently seeded, the Contractor shall care for the areas until acceptance of the Contract or acceptance of the turf, whichever is later. Where necessary, such care may include, but is not limited to providing warning signs or barricades for protection against traffic. Any surfaces that have settled, become gullied, or otherwise damaged due to the Contractor's operations shall be repaired at no additional expense to the state to re-establish the grade and soil conditions that existed prior to placing erosion control materials.

209-3.03 Temporary Mulch. The Contractor shall have the capability to mulch any disturbed areas on any given day (e.g., those areas where earthwork operations are ongoing, etc.). The Contractor shall apply mulch on disturbed areas consistent with the approved project schedule.

Mulch shall be spread uniformly in a continuous blanket at an approximate rate of 4 t/ha. Mulch may be spread by hand, mechanical spreaders, or blowers.

209-3.04 Temporary Seed and Mulch. The Contractor shall apply seed and mulch on disturbed areas consistent with the approved project schedule.

Prior to the application of seed, all areas where compaction has occurred shall be scarified. The seed bed shall be loose and friable for positive seed retention.

Ryegrasses shall be spread at a rate of 3.5 g/m^2 to uniformly cover the ground. Cereal grasses shall be spread at a rate of 11.2 g/m^2 to uniformly cover the ground. Seeds shall be evenly distributed by any method of sowing that does not injure the seeds in the process of spreading.

Mulch shall be spread immediately following application of seed. Mulch shall be spread uniformly in a continuous blanket at an approximate rate of 4 t/ha. Mulch may be spread by hand, mechanical spreaders, or blowers. Mulch and seed shall not be placed simultaneously, except in the case of hydroseeding.

209-3.05 Temporary Check Dam. Check dams shall be constructed where shown in the contract documents and in accordance with the standard sheets. A bedding type geotextile or stone scour protection shall be placed as indicated in the contract documents.

A. Prefabricated Check Dam. The length of each prefabricated check dam shall be as indicated in the contract documents. The dam shall be attached to the ground with wire staples. The staples shall be No. 11 gauge wire and be 150 mm - 210 mm long. Staples shall be placed as indicated in the contact documents.

The geotextile filter material shall be attached to the triangular frame by using wire ties or staples. The ties shall be placed evenly 0.3 m on center.

209-3.06 Temporary Haybale/Strawbale. Bales shall be placed with the cut ends vertical as shown in the contract documents. Each bale shall be embedded into the soil a minimum of 100 mm, and be securely anchored. Hardwood stakes shall be installed a minimum of 300 mm into the ground below the bale. The first stake in each bale shall be driven at an angle toward the previously laid bale to force the bales together.

209-3.07 Temporary Silt Fence. Unless otherwise detailed in the contract documents, silt fence shall be installed as follows:

1. Posts shall be driven into the ground.
2. Geotextile and any mesh support (if applicable) shall be placed on the upstream side of the posts.
3. The geotextile shall be fastened to each post in no less than 4 locations with approved fasteners.
4. The mesh support shall be fastened to each post at the top, bottom, and two additional evenly spaced locations, or by a continuous corded attachment along the top of the assembly.
5. Any geotextile or mesh splices necessary for fence erection shall be continuous between two post sections.
6. Geotextile at the bottom of the fence shall be buried in a trench to a depth of 150 mm. The trench shall be back filled with the excavated soil and the soil compacted by tamping.

209-3.08 Temporary Sediment Trap. Sediment traps shall be constructed where shown in the contract documents and in accordance with the standard sheets.

A. *Sand Bag Berm and Earth Berm.*

1. The area under which the sand bag berm or earth berm will be constructed shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared. All work shall be performed consistent with the requirements of §201-3 Construction Details.

2. The earth berm embankment shall be constructed consistent with the requirements of §203-Excavation & Embankment, except as herein modified. Immediately prior to placement of the impervious embankment material, the entire earth surface on or against which fill is to be placed, shall be thoroughly scarified to a depth of 150 mm and compacted to not less than 95 percent of Standard Proctor Maximum Density. Impervious embankment material shall then be deposited in horizontal layers not exceeding 200 mm in thickness prior to compaction. Each layer shall be compacted to not less than 95 percent of Standard Proctor Maximum Density. The moisture content of all impervious embankment material shall not be greater than 2 percent above Optimum Moisture Content as determined by A.A.S.H.T.O Designation: T-99, Method C at the time of compaction.

Sand bag and ditch dam sediment traps shall be constructed as shown on the Standard Sheets.

3. All fill slopes shall be 2:1 or flatter. Cut slopes shall be 1:1 or flatter.

4. Temporary mulch and rolled erosion control product shall be applied to earth berm side slopes.

5. Excavate and install light stone at emergency spillway.

B. Riser and Outlet Pipe. The section of the riser above the embedment shall be perforated with 25 mm diameter holes or slits spaced 150 mm vertically and horizontally and placed in the concave portion of the riser pipe. No holes shall be made within 150 mm of the outlet pipe.

The riser shall be wrapped with 6 mm to 12 mm hardware cloth wire then wrapped with Class A Geotextile Drainage Fabric. The geotextile shall extend 150 mm above the highest hole and 150 mm below the lowest hole. Where ends of geotextile come together, they shall be overlapped, folded and stapled to prevent bypass.

Straps or connecting bands shall be used to hold the geotextile and wire fabric in place. They shall be placed at the top and bottom of the cloth.

The riser shall be anchored with a steel plate base to prevent floatation. A 7 mm minimum thickness steel plate shall be attached and sealed to the riser by a continuous weld around the bottom to form a watertight connection. 600 mm of suitable material shall be placed on the plate and tamped.

Fill material around the outlet pipe shall be hand compacted in four 100 mm layers. A minimum of 600 mm of hand compacted backfill shall be placed over the outlet pipe before crossing it with construction equipment.

All outlet pipe connections shall be watertight.

C. Sediment Removal. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to ½ the design depth of the trap.

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209-3.09 Temporary Turbidity Curtain. Turbidity curtain shall be installed where shown in the contract documents and in accordance with the standard sheets.

A. Installation. Unless otherwise detailed on the plans, the curtain shall be installed as follows:

1. Be anchored and secured to prevent any soil material from passing beneath, over, around or through the barrier.

2. Have sufficient slack to permit the curtain to rise to the maximum expected high water level including wave action without being overtopped and still be in continuous contact with the bottom.

3. Have adjacent portions of the curtain secured so that suspended soil particles will not pass between the sections. Where the Contract documents requires sewn seams, the fabric will be overlapped a minimum of 100 mm and be stitched with two rows of rot and ultraviolet resistant thread.

4. Not be placed across a flowing stream.

5. Additional anchorage and/or anchorage cables are required in tidal applications.

6. The turbidity curtain shall remain in place until such time that construction activities have ceased in the area and the water contained within is free from turbidity.

B. Curtain Removal.

1. The area behind the turbidity curtain shall be cleaned prior to removal and the turbidity curtain shall remain in place until such time that water contained within is free from any resultant turbidity. The curtain shall be removed within 72 hours after this determination has been made.

2. The turbidity curtain shall be removed in such a manner so as to minimize release of sediment adhering to the turbidity curtain.

209-3.10 Temporary Pipe Slope Drain. Pipe slope drain shall be placed where shown in the contract documents and constructed in accordance with the standard sheets.

209-3.11 Drainage Structure Inlet Protection. Drainage structure inlet protection shall be placed where shown in the contract documents and constructed in accordance with the standard sheets.

209-3.12 Rolled Erosion Control Products and Soil Stabilizers. The time and method of placement shall be as specified in the contract documents and/or according to Manufacturer's recommendations.

For areas at final grade, all loose stones, clods, sticks, or other undesirable material shall be removed in accordance with the manufacturer's recommendations or as specified elsewhere in the contract documents. In addition, those areas at final grade shall be scarified to a minimum depth of 25 mm immediately prior to installation, unless topsoil is being placed and the erosion control material will be installed within 2 workdays of topsoil placement.

A. Rolled Erosion Control Products.

1. Class II, Type A, Jute Mesh. Jute mesh shall be placed without stretching on the freshly prepared surface so that it lays loosely on the soil and in contact with the soil at all points; and then it shall be rolled or tamped firmly into the soil surface. The upper end of each roll shall be turned down and buried to a depth of 150 mm with the soil firmly tamped against it. Unless otherwise specified in the contract documents, check slots shall be constructed at 15 m intervals down the slope. The construction procedure shall consist of placing a fold of material 150 mm vertically into the ground and tamping soil firmly against it. Jute mesh shall be placed so that all edges shall have a minimum overlap of 150 mm. The ends of rolls shall be placed with the upgrade section on top. Jute mesh shall be held tightly to the soil by anchors driven firmly into the ground. Anchors shall be spaced not more than 1 m apart on the sides and along the centerline of all drainage ways. Jute mesh ends and check slots shall have anchors spaced at 300 mm intervals.

2. Class I, Other Class II, and Class III Rolled Erosion Control Products. These products shall be placed and firmly anchored as stated in the manufacturer's instructions.

B. Class IV Soil Stabilizers. These materials shall be applied as recommended by the Manufacturer. Type A & B are intended to be applied with hydroseeding equipment. Type B may also be placed through dry spreading. When dry spreading method is used, the Contractor shall apply the material uniformly. Where applied, Type A shall be minimum of 6 mm thick. When Type A is used in conjunction with turf establishment, seeds must be sown separately and prior to the application of the soil stabilizer.

209-3.13 Construction Entrances. Construction entrances shall be placed where shown in the contract documents and constructed in accordance with the standard sheets.

The Contractor shall grade, including excavating or placing fill, to prepare the original ground surface for the placement of a stabilized pad of 150 mm of coarse aggregate material, underlain by a geotextile. If necessary, a drainage pipe shall be installed to maintain the capacity of the ditch. The pipe dimension shall be consistent with the modified soil erosion and sediment control plan approved by the Engineer. All areas cut or filled and not stabilized by the construction entrance material shall be covered with an erosion control treatment (temporary mulch, temporary seed and mulch, etc.) and shall be included in this pay item.

When washing is performed, the washing area within the construction entrance shall be located in an area which will drain into an approved sediment control measure(s).

The construction entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto the right-of-way. All sediment spilled, dropped, washed or tracked onto the right-of-way shall be removed immediately. In the event the entrance is no longer performing properly (i.e. the entrance aggregate becomes clogged with sediment), the Contractor shall top-dress the entrance with additional coarse aggregate material.

209-3.14 Temporary Pipe Inlet/Outlet Protection, Silt Fence. Temporary pipe inlet/outlet protection, silt fence, shall be placed where shown in the contract documents and constructed in accordance with the standard sheets.

209-4 METHOD OF MEASUREMENT. Measurement will be made for installation or reinstallation of temporary soil erosion and sediment controls shown in the contract documents.

209-4.01 Temporary Mulch. Measurement will only be made for work directed or approved by the Engineer. This work will be measured as the number of square meters of mulch to the nearest square meter.

209-4.02 Temporary Seed and Mulch. Measurement will only be made for work directed or approved by the Engineer. This work will be measured as the number of square meters to the nearest square meter.

209-4.03 Temporary Check Dams. Stone, gravel, and sand bag check dams will be measured by the number of check dams. All other check dams will be measured by the number of meters to the nearest meter.

209-4.04 Temporary Haybale/Strawbale. Bales will be measured by the number of meters to the nearest meter.

209-4.05 Temporary Silt Fence. Silt fence will be measured by the number of meters of silt fence to the nearest meter. No measurement will be made for seams or overlaps.

209-4.06 Temporary Sediment Trap. Sediment traps will be measured by the number of traps.

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209-4.07 Temporary Turbidity Curtain. VACANT Turbidity curtains will be measured by the number of square meters, to the nearest square meter, computed from payment lines provided in the contract documents. No measurement will be made for seams or overlaps.

209-4.08 Temporary Pipe Slope Drain. Pipe slope drain will be measured by the number of drains.

209-4.09 Drainage Structure Inlet Protection. Silt fence geotextile, and prefabricated drainage structure inlet protection measures will be measured by the number of meters to the nearest meter. Gravel bag measures will be measured by the number of cubic meters to the nearest cubic meter.

209-4.10 Rolled Erosion Control Products and Soil Stabilizers. Rolled erosion control products and soil stabilizers will be measured as the number of square meters to the nearest square meter.

209-4.11 Construction Entrances. Construction entrances shown in the contract documents will be measured by the number of square meters to the nearest square meter. Measurement will not be made for construction entrances associated with the contractor's operations (e.g., staging areas, storage yards, borrow sites, etc.).

209-4.12 Temporary Pipe Inlet/Outlet Protection, Silt Fence. Temporary pipe inlet/outlet protection, silt fence, will be measured by the number of meters to the nearest meter.

209-5 BASIS OF PAYMENT.

209-5.01 General. The unit price bid for all work items shall include the cost of furnishing all labor, equipment, and materials necessary to satisfactorily complete the work as shown in the contract documents, including the cost of excavation associated with the removal of accumulated sediment and the installation of erosion and sediment control measures covered by this Section.

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Progress payments will be made for check dams, turbidity curtain, silt fence, pipe slope drain, and sediment traps. Fifty percent of the price bid will be paid after installation. The remaining percentage will be paid when the temporary control measure is removed and the remaining area is permanently stabilized.

Payment will not be made for work which is attributed to the Contractor's negligence, carelessness or failure to install temporary or permanent controls in accordance with the contract documents.

209-5.02 Mulch. Mulching will only be paid for when directed or approved by the Engineer.

209-5.03 Seed and Mulch. Seed and mulch will only be paid for when directed or approved by the Engineer. In addition to the provisions of §209-5.01, the unit price bid for this item shall include water.

209-5.04 Sediment Trap - Temporary. In addition to the provisions of §209-5.01, the unit price bid for this item shall include bags, excavation, impervious embankment material, outlet pipe, riser assembly, light stone filling, and geotextile. Temporary mulch and rolled erosion control product will be paid for under their respective items.

209-5.05 Pipe Slope Drain - Temporary. In addition to the provisions of §209-5.01, the unit price bid for this item shall include bales, pipe, pipe end sections, stone, and geotextile.

209-5.06 Construction Entrances. In addition to the provisions of §209-5.01, the unit price bid for this item shall include any erosion control treatments (temporary mulch, temporary seed and mulch, etc.) required to stabilize an erodible surface produced by the installation of the construction entrance, periodic top-dressing with additional coarse aggregate material, and washing station provisions.

Additional sediment control measures (silt fence, haybale/strawbale, sediment trap, etc.) required to control a washing area will be paid for under their respective item(s).

Payment will be made under:

Item No.	Item	Pay Unit
209.1001	Mulch - Temporary	Square Meter
209.1002	Straw/Wood Fiber Mulch - Temporary	Square Meter
209.1003	Seed and Mulch - Temporary	Square Meter
209.1004	Seed and Straw/Wood Fiber Mulch - Temporary	Square Meter
209.110101	Check Dam (Ditch Bottom Width 0.0 to 1.0 m), Stone - Temporary	Each
209.110102	Check Dam (Ditch Bottom Width >1.0 to 2.0 m), Stone - Temporary	Each
209.110103	Check Dam (Ditch Bottom Width >2.0 to 3.0 m), Stone - Temporary	Each
209.110104	Check Dam (Ditch Bottom Width >3.0 m), Stone - Temporary	Each
209.110201	Check Dam (Ditch Bottom Width 0.0 to 1.0 m), Gravel Bag - Temporary	Each
209.110202	Check Dam (Ditch Bottom Width >1.0 to 2.0 m), Gravel Bag - Temporary	Each
209.110203	Check Dam (Ditch Bottom Width >2.0 to 3.0 m), Gravel Bag - Temporary	Each
209.110204	Check Dam (Ditch Bottom Width >3.0 m), Gravel Bag - Temporary	Each
209.110301	Check Dam (Ditch Bottom Width 0.0 to 1.0 m), Sand Bag - Temporary	Each
209.110302	Check Dam (Ditch Bottom Width >1.0 to 2.0 m), Sand Bag - Temporary	Each
209.110303	Check Dam (Ditch Bottom Width >2.0 to 3.0 m), Sand Bag - Temporary	Each
209.110304	Check Dam (Ditch Bottom Width >3.0 m), Sand Bag - Temporary	Each
209.1104	Check Dam, Silt Fence - Temporary	Meter

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209.1105	Check Dam, Prefabricated - Temporary	Meter
209.1201	Haybale/Strawbale - Temporary	Meter
209.1202	Strawbale - Temporary	Meter
209.13	Silt Fence - Temporary	Meter
209.1401nn	Sediment Trap, Earth Berm - Temporary	Each
209.1402nn	Sediment Trap, Sand Bag - Temporary	Each
209.1403nn	Sediment Trap, Ditch Dam - Temporary	Each
209.15	Turbidity Curtain - Temporary	Square Meter
209.160101	Pipe Slope Drain, 150 mm - Temporary	Each
209.160102	Pipe Slope Drain, 200 mm - Temporary	Each
209.160103	Pipe Slope Drain, 300 mm - Temporary	Each
209.160104	Pipe Slope Drain, 375 mm - Temporary	Each
209.160105	Pipe Slope Drain, 450 mm - Temporary	Each
209.160106	Pipe Slope Drain, 600 mm - Temporary	Each
209.160107	Pipe Slope Drain, 750 mm - Temporary	Each
209.1701	Drainage Structure Inlet Protection, Silt Fence - Temporary	Meter
209.1702	Drainage Structure Inlet Protection, Gravel Bag - Temporary	Cubic Meter
209.1703	Drainage Structure Inlet Protection, Prefabricated - Temporary	Meter
209.1801	Rolled Erosion Control Product, Class I Type A, Short Term	Square Meter
209.1802	Rolled Erosion Control Product, Class I Type B, Short Term	Square Meter
209.1803	Rolled Erosion Control Product, Class I Type C, Short Term	Square Meter
209.1901	Rolled Erosion Control Product, Class II Type A, Intermediate	Square Meter
209.1902	Rolled Erosion Control Product, Class II Type B, Intermediate	Square Meter
209.1903	Rolled Erosion Control Product, Class II Type C, Intermediate	Square Meter
209.2001	Rolled Erosion Control Product, Class III Type A, Permanent	Square Meter
209.2002	Rolled Erosion Control Product, Class III Type B, Permanent	Square Meter
209.2003	Rolled Erosion Control Product, Class III Type C, Permanent	Square Meter
209.2004	Rolled Erosion Control Product, Class III Type D, Permanent	Square Meter
209.2101	Soil Stabilizers, Class IV Type A	Square Meter
209.2102	Soil Stabilizers, Class IV Type B	Square Meter
209.22	Construction Entrance	Square Meter
209.23	Pipe Inlet/Outlet Protection, Silt Fence - Temporary	Meter

NOTE: nn denotes serialized pay item, see §101-02 Definition of Terms under "Specifications". These items will be paid for by the each within established size groups.

SODDING

Make the following changes to *Volume II of the Standard Specifications of January 2, 2002*:

Page 6-68, line 21, **thru Page 6-72**, line 1; **delete** entirely and replace with the following:

SECTION 612 - SODDING

612-1 DESCRIPTION. This work shall consist of preparing the sod bed including topsoil, furnishing, delivering, placing, and caring for sod in the locations shown and specified in the contract documents.

612-2 MATERIALS. Materials for sodding shall meet the following requirements.

Water	712-01
Topsoil	713-01
Sod	713-14
Fertilizer	As specified in the contract documents. Where not specified, fertilizer shall be 713-03 Type No. 1 or as approved by the Engineer.

612-3 CONSTRUCTION DETAILS.

612-3.01 Limitations. The Contractor shall notify the Engineer at least two working days before beginning to place sod. The Contractor shall not begin the work until written permission from the Engineer has been received.

No frozen sod shall be placed nor shall sodding be done when the ground surface is frozen. When frost or excessive moisture exist that will prevent satisfactory results from being obtained for any stage of work, the Engineer will stop the work and it shall be resumed only when allowed by the Engineer.

612-3.02 Procuring Sod. The Contractor shall exercise maximum care to retain the soil existing on the roots of the sod during transporting, handling and transplanting operations. Dumping or dropping of sod from vehicles will not be permitted. Sod shall be planted within twenty-four hours from the time of harvesting, unless it is tightly rolled, or stored roots-to-roots. All sod in stacks shall be kept moist and protected from exposure to the sun and from freezing. The maximum period of time from harvesting to planting shall not exceed forty-eight hours. Sod that is stored on the project site prior to planting shall meet the moisture requirements of §713-14 at the time of planting.

612-3.03 Ground Preparation. There shall be a minimum of 50 mm of topsoil under all sod unless otherwise specified. The subgrade of areas to be sodded shall be excavated and firmed to a sufficient depth below the finished grade of the sod to accommodate the tamped or rolled thickness of topsoil and sod.

Fertilizer shall be applied at a rate of 6 grams of nitrogen per square meter unless otherwise specified in the contract documents.

Fertilizer applied under this work shall be uniformly mixed with the topsoil to a depth of at least 50 mm before the sod is laid, unless otherwise specified or approved.

612-3.04 Finished Grade for Sod . When laid in strips adjacent to paths, pavements, drain inlets and other structures, the finished sod surface shall be flush with surface of the adjacent soil and the adjacent structures. Sod laid in drainage ways, and areas to be continuously or solidly sodded shall meet

the finished grades as shown in the contract documents. Grades shall be formed with special care at the junction of drainage ways.

612-3.05 Placing Sod. The soil on which the sod will be laid shall be moist. The soil shall be watered prior to sodding, if so directed. The sod shall be laid smoothly, edge to edge and all openings shall be plugged with sod. In drainage ways and where continuous or solid sodding is indicated and/or specified in the contract documents, the sod shall be laid with the longest dimension parallel to the contours. Sodding shall start at the base of slopes and progress upwards in continuous parallel rows. Vertical joints between sides shall be staggered. Immediately after laying, sod shall be pressed firmly into contact with the sod bed by tamping, rolling, or by any other method that will eliminate air pockets, provide true and even surfaces, ensure knitting and protect all exposed sod edges, but without damaging or displacing the sod or deforming the finished sod surface. At the time of placing, the sodded areas shall be watered evenly and at a rate of 20 liters per square meter.

612-3.06 Anchoring. Sod shall be firmly anchored in all drainage ways, on slopes 1 on 2 or steeper, and wherever else specified or directed. Sod shall be anchored immediately after tamping. All anchors shall be driven flush to the ground.

612-3.07 Finishing. Excess sod or excess soil resulting from the sodding operation shall be disposed of by the Contractor. Excess soil shall not be left to form a ridge adjacent to the sodded area or sodded strips.

612-3.08 Care During Construction. The Contractor shall care for the sodded areas until all work on the entire contract has been completed and accepted. When necessary, such care shall consist of providing protection against traffic by warning signs or barricades. In locations where mowing is specified, the grass shall be mowed until the acceptance of the Contract to a height of 75 mm when the growth reaches a height of 125 mm or as directed.

All sod shall be watered at weekly intervals for a minimum of four weeks following installation and in accordance with §615-3.01, unless otherwise specified or directed. Additional watering shall be performed if specified in contract documents. When watered, sufficient water shall be applied to wet the sod at least 50 mm into the sod bed. Watering shall be done in a manner that will not cause erosion or other damage to the finished surfaces. Any surfaces that have settled, become gullied or otherwise damaged shall be repaired at the Contractor's expense to re-establish the grade and conditions of the soil prior to sodding and shall then be re-fertilized and re-sodded as specified under this work.

612-3.09 Period of Establishment. When the Engineer decides that any area that has been sodded fails for any reason to produce a satisfactory turf after a suitable period of time has elapsed, the Contractor shall re-sod such areas in the same manner as specified in the contract until a satisfactory turf has been established. Any work to be corrected shall be at the Contractor's expense. The contract will not be accepted until a satisfactory turf has been produced unless the work necessary to assure satisfactory turf will be done under the provisions of an uncompleted work agreement.

612-4 METHOD OF MEASUREMENT. Sodding including top soil bed will be measured as the number of square meters of surface area that have been acceptably completed.

612-5 BASIS OF PAYMENT. The unit price bid per square meter shall include the cost of all labor, equipment, materials, including topsoil placed under the sod, water used during planting, and necessary excavation, equipment and incidentals necessary to acceptably complete and care for the work as

specified. When the quantity of sod is equal to or less than 400 square meters, the watering necessary to establish the sod after planting shall be included in the price bid for sodding including top soil bed. When the quantity of sod exceeds 400 square meters, the watering, except initial watering at time of planting, shall be paid for under the watering vegetation item in the Contract.

Payment will be made under:

Item No.	Item	Pay Unit
612.01 M	Sodding including Top Soil Bed	Square Meter