8-6-2012

Supplemental Specifications (Section 200) of the Standard Specifications for Road and Bridge Construction, March 1, 2006

Tennessee. Department of Transportation.

S T A T E **O F** **T E N N E S S E E**

Rev. 10-20-07 March 1, 2006
Rev. 03-23-09
Rev. 05-5-2010
Rev. 08-06-2012

Supplemental Specifications - Section 200

of the

Standard Specifications for Road and Bridge Construction

Subsection 201.03-Clearing and Grubbing. Replace the entire subsection with the following:

201.03-Clearing and Grubbing. The Engineer or Contractor when required will establish rights-of-way lines and construction lines, and the Engineer will designate all trees, shrubs, plants, and other objects to remain. The rights-of-way necessary for construction, as directed by the Engineer, shall be cleared of all dead trees, stumps, brush, projecting roots, hedge, weeds, pole stubs, logs, and other objectionable material. All trees, stumps, roots, pole stubs, brush, hedge, and other protruding obstructions within the area bounded by lines 5 ft. (1.5 m) outside the construction lines shall be completely grubbed except sound undisturbed stumps and roots which will be a minimum of 5 ft. (1.5 m) below subgrade or slope of embankment may be allowed to remain in place provided undercutting or other corrective measures, or topsoil stripping is not stipulated in the Plans or directed by the Engineer and providing stumps do not extend more than 6 in. (15 cm) above the ground surface. This work shall be done in advance of excavation and embankment operations.

Before construction activities begin, two types of areas must be marked within the project site. First, the limits of disturbance (clearing limits) must be clearly marked using staking or another acceptable visible marking method. Second, any environmentally sensitive areas such as streams, wetlands, buffers and ARAP boundaries that are included in the project boundaries must be marked with highly visible markers. Highly visible markers must be readily visible to project personnel including equipment operators.

Clearing and grubbing operations shall be avoided in areas designated to remain undisturbed as specified in the project's Stormwater Pollution Prevention Plan and any other applicable environmental permits. For clearing and grubbing activities associated with borrow pits or waste areas furnished by the Contractor, the borrow pits or waste areas must be approved in advance by the Project Supervisor, the Environmental Coordinator, and the Environmental Division and operated and maintained in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

When embankments are to be constructed in swampy areas, and undercutting or other corrective measures are not stipulated in the Plans or directed by the Engineer for these areas, undisturbed trees and stumps may be cut off at not more than 6 in. (15 cm) above the ground surface or low water level and the stump and root mass remain in place, if approved by the Engineer.

Unless marked for removal by the Engineer, living trees more than 5 ft. (1.5 m) outside the construction lines of the road are to be undisturbed, and are to be protected by the Contractor during construction of the project. Cut or scarred surfaces of trees or shrubs shall be treated with a paint prepared especially for tree surgery.

Clearing of hedge, weeds, pole stubs, logs, and other objectionable material inside the rights-of-way but outside the construction lines shall be completed to the ground surface.

Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be removed as directed. Branches of trees extending over the roadbed shall be trimmed to give a clear height of 20 ft. (6 m) above the roadbed surface. All trimming shall be done by skilled workmen and in accordance with good tree surgery practices.

Trees more than 5 ft. (1.5 m) outside the construction lines and marked for removal by the Engineer shall be cut off within 6 in. (15 cm) of the ground surface. All stumps more than 5 ft. (1.5 m) outside the construction lines shall be trimmed to within 6 in. (15 cm) of the ground surface.

Wood debris that is chipped on site shall be properly disposed of so that does not become part of embankment. Within the areas where embankments are to be constructed, all depressions resulting from grubbing operations shall be backfilled with suitable excavation material and compacted in accordance with the provisions of Section 205 to natural ground elevation before embankment construction is started.

Depressions in excavation areas which are below finished subgrade elevation resulting from grubbing operations shall be backfilled with suitable material and compacted to finished subgrade in accordance with the provisions of Section 205 during the excavation operations.

Backfilling shall be completed a satisfactory distance ahead of embankment construction operations.

All slopes of cuts, embankments, ditches, channels, waterways and all structures both old and new, shall be cleared of all brush, hedges, weeds, heavy vegetation, and other objectionable material; and shall be maintained in a neat and satisfactory condition until the project is accepted.

Areas approved as borrow pits by the Engineer shall be cleared and grubbed of all trees, stumps, brush and heavy vegetation. Areas designated for obtaining construction material other than borrow material shall be cleared and grubbed of trees, stumps, brush and vegetation, and in addition shall be stripped of overburden laying above the material to be obtained. This work shall be completed well in advance of the removal of borrow or construction materials. Any offsite borrow areas must also be in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual

Areas within the limits of all drainage structures shall be cleared of all objectionable material to within 3 in. (75 mm) of the ground surface. Such areas shall extend the full length of the structures, as measured along the center-line of the highway, and to the rights-of-way lines along lines parallel to the centerline of the inlet and outlet channel or drainage of the structure. These areas shall also include the entire area of all easements obtained for drainage purposes.

Subsection 201.04- Disposal of Debris. Replace second paragraph with the following:

When permitted by the Engineer, perishable materials and debris may be removed from the rights-of-way and disposed of at locations off the project, outside the limits of view from the project during all seasons as long as the work is in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. The cost involved shall be

included in the bid cost for the project. In addition the material shall be disposed of in accordance with all applicable laws and ordinances regarding solid wastes as per Tennessee Department of Environment and Conservation requirements.

Subsection 201.05-Method of Measurement. Add the following to the end of the first paragraph.

"When the bid schedule contains an item for Clearing and Grubbing on a lump sum basis, no measurement of area will be made."

Subsection 201.06-Basis of Payments. Revise entire subsection to the following:

"Payment for Clearing and Grubbing shall be made at the contract unit price per lump sum and shall be full compensation for completing the Clearing and Grubbing as outlined on the Plans and in these Specifications."

Payment for Clearing and Grubbing (Borrow Pits) at the contract unit price per acre (hectare) shall be full compensation for completing the Clearing and Grubbing of Department furnished borrow pits as outlined in the Plans and in these Specifications. These borrow areas will be furnished in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Subsection 202.03-General. Replace the last sentence of the first paragraph with the following:

Material disposed of on private property shall be disposed of in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Subsection 202.04- Removal of Bridges, Culverts, and Other Drainage Structures. Replace the entire subsection with the following:

202.04-Removal of Bridges, Culverts, and Other Drainage Structures. Bridges, culverts and other drainage structures in use by traffic shall not be removed until satisfactory arrangements have been made to accommodate traffic. All bridge, culvert and drainage structure removal from streams must comply with any terms and conditions specified in applicable environmental permits, including the TN Construction General Permit. The Contractor will use highly visible markers to clearly mark permit boundaries and disturbed area limits.

Unless otherwise specified or directed, such portions of the substructures of bridges located in a stream shall be removed to 1 ft. (30 cm) below the adjacent ground level or natural stream bottom or the lowest scour elevation shown on the contract plans if shown to uncover the existing portion of the substructure. An exception to the above rule may occur if such portions of the substructure of a bridge are located in a stream or wetland, and then it shall be subject to the requirements set out in the permit form of the applicable State and Federal agencies approving the location and plans and authorizing the construction of the bridge. Where such portions of existing structures lie wholly or in part within the limits for a new structure, they shall be removed as necessary to accommodate the construction of the proposed structure.

Steel bridges, precast or precast prestressed bridges and wood bridges designated to become the property of the Department shall be carefully dismantled without unnecessary damage. All such material shall be stored as specified in **Subsection 202.03.**

The removal of bridge decks shall be governed by the following:

1. Where bridge decks are to be wholly removed, but the girders are to remain in service;

   A. If the contractor elects to employ concrete saws to aid in the removal of the concrete deck, sawing transverse, the depth of the cut may not exceed the following :

      - Decks supported by steel beams or girders, 3-in. (75mm.)
      - Decks supported by prestressed concrete beams, 3-in. (75mm.)
      - Decks of cast-in-place hollow box or t-beam bridges, 1-in. (25mm.)

   B. The remainder of the slab depth under the cuts must be completed using pneumatically or electrically operated chipping hammers, not exceeding 60 lbs. (27.2 kgs.) in weight.

   C. Longitudinal saw cuts may be full depth, but no closer than –

      - Decks supported by steel beams or girders, within 1-in. (25 mm) of the widest top flanges.
      - Decks supported by prestressed beams, within 1 in. (25 mm) of the top flange.
      - Decks of hollow boxes or t-beam bridges, within 1-in. (25 mm) of the web, unless otherwise noted on the contract plans.

2. Where only the slab overhangs are to be removed, and if the contractor elects to employ concrete saws to aid in the removal of overhangs, only the top 1-in. (25 mm) of the slab may be saw cut. Pneumatically or electrically operated chipping hammers, not exceeding 60 lbs. (27.2 kgs.) in weight may be used to remove the remainder of the concrete. Care shall be taken not to damage transverse slab reinforcing bars.

3 Where bridge decks are to be removed as part of complete bridge demolition and the contractor elects to employ concrete saws in the removal of the deck, the depth of the cuts may not exceed the following:

   A. Decks supported by steel beams or girders, the plans depth of slab minus 1-in. (25 mm).
   B. Decks of hollow box or t-beam bridges; if not otherwise shown on the contract plans, the contractor shall submit a plan to the engineer for approval.

The use of hoe rams, pneumatic shears, pavement breakers, or other heavy equipment to remove slabs, where girders or adjacent slab portions are to remain, is strictly prohibited.

Blasting or other operations necessary for the removal of an existing structure or obstruction, which may damage new construction, shall be completed prior to placing the new work, or adequate precautions shall be taken to prevent such damage.

Subsection 203.01 Description. Add the following as the last paragraph to this Subsection:

The Contractor must address both natural and created steep slope areas as required in the TN Construction General Permit. Steep slope requirements for erosion prevention and sediment controls and stabilization shall be in accordance with the TN Construction General Permit and any other applicable environmental permits.

Subsection 203.02-Classification. Replace the entire subsection with the following:

(a) Road and Drainage Excavation (Unclassified).

All excavation performed under this Section, including portland cement concrete located above subgrade elevation, other than Borrow Excavation, Channel Excavation, and Undercutting, will be considered unclassified excavation regardless of the nature of the material excavated.

(b) Borrow Excavation.

Borrow Excavation shall consist of material required for the construction of embankments or other portions of the work and shall be obtained from approved sources outside the right-of way limits in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual, unless otherwise designated in the Plans. However, any material, other than Borrow Excavation (Unclassified), as may be found in the excavation that meets the specifications of the designated borrow material may be used in the project in accordance with the conditions prescribed in **Subsection 104.10**. However, if the flattening of certain cut slopes on projects graded under previous contracts is desirable and approved in writing by the Engineer, the Contractor will be permitted to use this material for borrow provided the material is satisfactory and in accordance with plans approved by the Engineer, and provided he complies with the requirements of **Subsection 203.04** regarding borrow areas. Borrow material shall not be obtained from wetland areas, unless otherwise noted on the Plans and approved by applicable environmental permits

Borrow shall be classified as Borrow Excavation (Solid Rock), Borrow Excavation (Graded Solid Rock), Borrow Excavation (Unclassified), or Borrow Excavation (Select Material). Borrow Excavation (Solid Rock) shall consist of the removal and satisfactory placement of non-degradable rock which cannot be economically excavated by the proper use of a power shovel or without the use of explosives. Borrow Excavation (Unclassified) shall consist of the removal and satisfactory placement of all approved material encompassed under the classification of Borrow Excavation (Solid Rock) and all other approved material.

Borrow Excavation (Graded Solid Rock) shall consist of the removal and satisfactory placement of sound, non-degradable rock with a maximum size of 3 ft. (1 m). At least 50 percent of the rock shall be uniformly distributed between 1 ft. (30 cm) and 3 ft. (1 m) in diameter and no greater than 10 percent shall be less than 2 in. (50 mm) in diameter. The material shall be roughly equi-dimensional in shape. Thin, slabby material will not be accepted. The Contractor shall be required to process the material with an acceptable mechanical screening process that produces the required gradation. When the material is subjected to five alternations of the sodium sulfate soundness test (AASHTO T 104), the weighted percentage of loss shall be not more than 12. The material shall be approved by the Engineer before use.

Borrow Material other than solid rock shall be AASHTO M 145, classification A-6 or better if reasonably available. If classification A-6 is not reasonably available, the borrow shall be no worse than the predominant soil type in the roadway excavation based on AASHTO classification.

Borrow Excavation (Select Material) for special construction purposes shall meet the requirements set forth in the Contract.

Material obtained from an approved borrow source off the right-of-way as provided in this Subsection shall not be utilized to produce processed aggregate as described in Section 903. In no case shall material excavated from an offsite borrow source be utilized in base or other paving courses above the elevation of the subgrade.

Unless otherwise designated in the Contract, the Contractor shall make his own arrangements for obtaining borrow material in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

(c) Channel Excavation (Unclassified).

This item shall consist of the removal and satisfactory disposal of all material, regardless of its nature and the manner in which it may be removed, that is excavated for channel changes in widening, deepening, and straightening existing channels or constructing new ones, which have a width at the bottom of more than 14 ft. (4 m) as indicated on the Plans. All other similar excavation with a bottom width 14 ft. (4 m) or less, as shown on the Plans, shall be paid for as Road and Drainage Excavation (Unclassified).). Any channel excavation that includes an existing stream or a proposed stream relocation must be constructed as specified in the applicable environmental permits.

(d) Undercutting.

This item shall consist of removing and disposing of unsatisfactory materials below grade in cut sections, from areas upon which embankments are to be placed, and may also include material excavated below the Foundation elevation for pipe, box culverts and box bridges as described in **Subsection 204.12**. Undercutting does not include the stripping, stockpiling and placing of topsoil, described in **Subsection 203.06**, nor does it include step-benching in the preparation of embankment areas on hillsides. Disposal of undercutting material off rights-of-way shall be conducted in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Subsection 203.04 General. Replace the entire subsection with the following:

203.04-General. Prior to beginning excavation, grading, and embankment operations in any area, all necessary Clearing and Grubbing, Removal of Structures and Obstructions and placement of Erosion Control Devices in that area shall have been performed in accordance with **Section 201, Section 202** and **Section 209**, respectively, of these Specifications.

Excavation materials shall be removed in such a manner that the slopes may be neatly trimmed to the lines given. The Engineer may change the slopes shown on the original cross sections, depress raised medians or islands, raise depressed medians or islands or daylight cuts to increase or decrease the quantity of Road and Drainage Excavation (Unclassified) provided the material can be excavated without blasting and these changes are set in the slope stakes prior to commencement of excavation of the affected slopes, medians or islands. Any additional material

thus obtained shall be paid for at the contract unit price bid for Road and Drainage Excavation (Unclassified).

Excavation required to correct slides, regardless of its location relative to the theoretical slope line, or excavation required to prevent potential slides including blasting, and the dressing, reshaping or flattening of the affected slopes as directed by the Engineer, shall be paid for under the Item for Road and Drainage Excavation (Additional Material) in accordance with **Subsection 203.10**. If it becomes necessary to flatten a slope to correct a slide or prevent a potential slide after the cut has been started but not completed, payment under Road and Drainage Excavation (Additional Material) will be limited to material removed between the original staked slope line and the newly established slope line above the elevation to which the cut has been made. All other material will be paid for at the contract unit price of Road and Drainage Excavation (Unclassified). Seeding, sod and other incidental items required to repair the slide area will be paid for at the contract unit price bid for the respective items.

If more material is required to complete the embankments after all cuts have been brought to grade and all Road and Drainage Excavation (Unclassified) has been removed from within the balance, additional materials shall be obtained from within the rights-of-way by flattening, widening or daylighting cut slopes, and by depressing raised medians or islands at locations designated and as directed by the Engineer provided:

(a) The cost of this material is more economical than borrow excavation.

(b) The material is available within the adjusted balance where the shortage exists or the material may be hauled outside the limits of adjusted balance if the cost of the material is more economical than borrow when the additional cost of overhaul is considered.

(c) The material can be excavated without blasting.

(d) There is a minimum of 20 ft. (6 m) between the top of the existing slope and the top of the new slope and minimum of 5 ft. (1.5 m) between the top of the new slope and Rights-of-Way Line or Control Access fence. The 20 ft. (6 m) minimum will not apply when the existing slope is 4:1 or flatter or to overlapping or near overlapping slopes in medians or between parallel roads or ramps. The 20 ft. (6 m) minimum may be reduced at the written request of the Contractor.

This additional material is to be paid for under the item for Road and Drainage Excavation (Additional Material) in accordance with **Subsection 203.10**.

When additional material is paid for under the item for Road and Drainage Excavation(Additional Material) and additional clearing and grubbing is required, the additional clearing and grubbing will be measured and paid for by the acre (hectare), provided the item for Adjusted Clearing and Grubbing is in the Contract, or as negotiated. No additional payment will be made for extra handling of stockpiled topsoil made necessary by the use of the item for Road and Drainage Excavation (Additional Material).

The roadbed through rock cuts shall be constructed to the grading line shown on the Plans, with an allowable working tolerance of plus 1 to minus 3 in. (plus 25 to minus 75 mm). The portions of the roadway that are less than 3 in. (75 mm) below grade shall be brought to grade with spalls or other suitable granular material that is available from the excavation within the

balance. If such excavation is not available, the Engineer may direct the Contractor to use approved base material for capping. Payment for furnishing and placing said base material will be made at the contract unit price bid per ton (metric ton) for the applicable Item in **Subsection 303.14**. When base material is not a bid item in the Contract, the material shall be furnished under the provisions of **Subsection 104.03**. If the roadbed is excavated in excess of 3 in. (75 mm) below the grading line shown on the Plans, the Contractor will be required to furnish and place at his own expense sufficient amounts of spalls or base material to bring the roadbed to a line 3 in. (75 mm) below the grading line.

Where sodding is indicated on the Plans to be placed on rock cuts, the rock shall be removed to 1 ft. (30 cm) below the grading line and backfilled to grade with earthen material prior to placing the sod. Measurement and payment of this work will be made under Items for Roadway and Drainage Excavation (Unclassified) and Sodding (New Sod).

All suitable materials removed from the excavation areas shall be used in the construction of embankments, intersecting road approaches, and in such other places as directed. Embankment construction shall be performed in accordance with the provisions of **Section 205** of these Specifications.

When boulder formations occur, the roadbed in the excavation area shall be scarified and all boulders removed to a depth of 12 in. (30 cm) below grade. The cavities thus formed shall be backfilled with suitable material and compacted.

All rock cuts shall be presplit at the outside limits of the cut areas. Presplitting shall consist of forming a plane of split rock prior to any primary blasting. The plane shall be formed for the entire depth of the cut or to a predetermined bench level. Presplitting shall be accomplished by drilling holes of appropriate size to the desired depth along the outside limits of the cut area, loading such holes with appropriate charges of explosives, stemming with minus 3/8 in. (9.5 mm) clean stone chips to the collar of the holes and detonating simultaneously. The initial horizontal spacing of holes and vertical spacing of charges and blasting cord for simultaneous detonation shall be as recommended by a reliable powder company. Adjustments of horizontal hole spacing and vertical spacing of charges shall be made as necessary to obtain a relatively smooth shear plane. Sand, gravel, clay, or dirt will not be permitted for stemming. In drilling holes for presplitting, the drills shall be plumbed for vertical slopes or set on the required slope when other than vertical slopes are specified, and all holes shall be drilled in the same plane. Presplitting will not be required on slopes flatter than 1 to 1. After presplitting is done, the drilling of primary blast holes shall be kept at least 3 ft. (1 m) or more from the presplit face. Presplitting of rock cuts under bridge sites shall be in accordance with the provisions of this Subsection and hole spacing shall be as specified under **Subsection 204.08**. Blasting records shall be made available on request by the Engineer. Blasting shall not be permitted within 300 ft. (100 m) of any Structure or concrete until at least 72 hours have elapsed after placement of the concrete. The Contractor will be responsible and replace and/or repair any and all damages at no expense to the Department.

All loose rock on cut slopes shall be removed immediately. Excavation material shall not be wasted, deposited or disposed of outside the construction lines unless directed by the Engineer. All excavation material wasted, deposited or disposed of outside the construction lines must be in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. Obliteration of old roadways shall include all grading operations necessary to incorporate the old roadway into the new roadway and surroundings in order to provide a pleasing appearance from the new roadway.

Removal of concrete pavement, base, parking strip, sidewalk, curb and gutter, etc. will be paid for under the classifications as prescribed in **Subsections 202.06 and 203.02(a).** Roadway obliteration will be paid for as Road and Drainage Excavation (Unclassified).

When the Contractor's excavating operations encounter remains of prehistoric people's dwelling sites or artifacts of historical or archaeological significance, the operations shall be temporarily discontinued. The Engineer will contact archaeological authorities to determine the disposition thereof.

The Engineer shall designate as unsuitable those soils that cannot be properly compacted in embankments. All unsuitable soil shall be disposed of as directed at no additional cost.

When the location of unstable soil is shown on the Plans, its removal and replacement shall be as shown.

The Contractor shall notify the Engineer sufficiently in advance of opening any borrow area so that, after stripping, cross section elevations and measurements of the ground surface may be taken, and so that the borrow material can be tested before being used. The borrow area shall be approved in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. At least 14 days' time shall be allowed for testing borrow materials or other material from roadside pits that is proposed for construction purposes.

Unless otherwise permitted, borrow material shall not be placed until after the roadway excavation has been placed in the embankments. If the Contractor places more borrow than is required and thereby causes a waste of excavation, the amount of such waste will be deducted from the borrow volume as measured in the borrow area. The Contractor shall not excavate beyond the dimensions and elevations established.

When the Contractor elects to remove highway fencing to obtain borrow materials, the fencing shall be replaced with new fence at the Contractor's expense. The Contractor shall be responsible for the confinement of livestock when a portion of the fence is removed.

Borrow pits shall be approved in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual and excavated in such a manner that they will be self-draining where possible and practicable, and shall be of a shape that can be easily cross sectioned.

When the Contractor's excavation operations are completed the area shall have a neat appearance. All borrow areas, except those portions which are under water in the case of pits which are not self-draining, shall be covered with topsoil and stabilized in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Furnishing and placing of topsoil and seeding (with mulch) shall be performed in accordance with the provisions of **Subsection 203.06** and **Section 801**, respectively.

Furnishing and placing topsoil and stabilization of borrow areas, as specified above, shall be included in the bid cost for the project as specified in the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

The Contractor's attention is called to **Sections 53-801 through 53-809** of the **Tennessee Code, Annotated**, the provisions of which apply to borrow pits 1 acre (4047 m^2) or more in size that are not self-draining. Full information regarding the requirements to be complied with and the necessary permits which the property owner must secure for the construction of a pond, lake, borrow pits, etc., one acre or larger which is not constructed to drain, will be supplied upon application to the Tennessee Department of Environment and Conservation.

All existing roads within the right-of-way and not in the graded area that are to be abandoned shall be scarified, obliterated, top-soiled, and seeded. Scarifying and obliterating the pavement

will not be measured and paid for directly, but the cost will be included in the cost of other items. Topsoil will be measured and paid as outlined in **Section 203.09** and **203.10.** Seeding, in accordance with **Section 801** of these Specifications, will be measured and paid for under the item for Seeding.

When additional material is paid for under the item for Road and Drainage Excavation(Additional Material) and additional clearing and grubbing is required, the additional clearing and grubbing will be measured and paid for by the acre (hectare), provided the item for Adjusted Clearing and Grubbing is in the Contract, or as negotiated. No additional payment will be made for extra handling of stockpiled topsoil made necessary by the use of the item for Road and Drainage Excavation (Additional Material).

Subsection 203.05-Undercutting. Add the following as the last sentence of the first paragraph:

If undercutting material is to be disposed of off rights-of-way, disposal shall be conducted in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual, and the site to be used for disposal must be approved in advance by the Project Supervisor, Environmental Coordinator, and the Environmental Division.

Subsection 203.06-Stripping, Stockpiling and Placing Topsoil. Revise the first paragraph to the following:

203.06-Stripping, Stockpiling and Placing Topsoil. The Engineer will designate areas between slope stake points in both cut and fill from which the existing topsoil shall be stripped and stockpiled. The quantity of topsoil to be stripped shall be sufficient to provide, over all areas to be seeded, a depth of 2 to 3 in. (50 to 75 mm) of the material. If the quantity of topsoil available in such areas is insufficient, the Contractor shall make up the deficiency with topsoil from an approved borrow area in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. The quantity of topsoil from such a source shall be measured by cross sectioning the area before and after removal.

Subsection 203.07-Disposal of Excess or Unsuitable Material. Revise the entire subsection to the following:

203.07-Disposal of Excess or Unsuitable Material. Excess excavation material shall be used to raise, widen or flatten the slopes of embankments; to fade embankments into cuts; or be placed in such other locations and for such purposes as the Engineer may direct.

Specific instructions will be given by the Engineer regarding the disposal of surplus material. Excess or unsuitable material placed within the rights-of-way limits shall be placed and compacted in accordance with **Subsection 205.04**. Foundation preparation for and drainage through these waste areas shall be equivalent to that provided for the adjacent roadway embankment.

If no suitable place can be found to dispose of excess or unsuitable material within the limits of the rights-of-way, the Engineer may direct the Contractor to provide a suitable site off the rights-of-way at no additional cost in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Furnishing and placing topsoil and seeding waste areas inside the Rights-of-Way shall be measured and paid for at the contract unit prices bid for the respective items. Furnishing and

placing topsoil and seeding on waste areas outside the Rights-of-Way in accordance with the above provisions will not be paid for directly, and the costs thereof shall be included in the unit price bid for other items of construction.

When waste material is placed off the rights-of-way which, in the judgment of the Engineer, are so removed from the rights-of-way as to not constitute a potential threat to the stability of the project, the contractor should follow the requirements outlined in the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual to ensure the waste area is properly designed, regulated, and implemented.

Subsection 203.09-Method of Measurement. Delete the next to the last paragraph which begins with, "Overhaul of Road and Drainage Excavation".

Subsection 203.10-Basis of Payment. Delete the last paragraph.

Subsection 204.02-Classification (g) Bedding Material for Support for Pipe Culverts. **Add** the following sentence to (g):

"Payment for Type "A" or Type "B" backfill including bedding material will be included in the unit price of the pipe unless otherwise specified in the plans."

Subsection 204.06 Add the following before section (a)

"The contractor shall submit for approval a proposed mix design in accordance with **Subsection 604.03."**

Subsection 204.06 (a), second paragraph, **Delete** the first sentence and replace with the following:

"The above Specification Limits may be adjusted by the Engineer to obtain the consistency required for satisfactory flow."

Subsection 204.08-Excavation (a) and (c). Replace Subsection (a) and (c) with the following:

(a) Bridges, Box Culverts and Other Major Structures.

Before excavation is started the Engineer or Contractor when required, will set stakes locating and outlining the structure and cross section for excavation computations. The Contractor will also use highly visible markers to mark disturbed area and undisturbed area limits. Highly visible markers must be readily visible to project personnel including equipment operators. No excavation shall be started prior to that time.

All structure excavation shall be cut to the lines and elevations indicated on the Plans, or as directed by the Engineer. Working variations outside the neat lines will be permitted; however, only that excavation outlined under **Subsection 204.12** will be measured for payment.

No excavated materials shall be deposited or disposed of outside the construction lines unless directed and approved by the Engineer in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

When solid rock is encountered in roadway cut sections and channel sections under bridges, presplitting operations shall be performed in accordance with the provisions of **Subsection 203.04**. Hole spacing along bridge abutment sites shall not exceed 12 in. (30 cm). Where overshooting of rock, beyond the cut sections shown on the bridge plans

cause modification of bridge abutments or span lengths, such modifications shall be made at the contractor's expense.

Inclined surfaces of rock used as foundation shall be excavated either level or in steps. When necessary, as determined by the Engineer, to obtain good bond, the surface of rock foundation shall be roughened, or suitable anchors installed. Over-excavations that require re-design, or increased bridge length and/or quantities, or supplemental retaining walls or other earth retaining structures shall be paid at the expense of the Contractor.

Existing concrete foundations, boulders, or ledge streaks of rock projecting into the bottom of the excavation shall be removed to a depth of 6 in. (15 cm) below foundation elevation, and the space backfilled with approved material and thoroughly compacted.

Excavation below bridge foundation elevations as given shall be done only upon direction of the Engineer. All materials moved without such authority shall be replaced by the Contractor without compensation by constructing a sub-footing of the same materials as the footing of the structure unit and 6 in. (15 cm) wider on every side.

(c) Utilization of Excavated Materials.

All suitable excavated material shall be utilized as backfill or embankment. Excess or unsuitable material shall be disposed of in such a manner as not to obstruct the stream or otherwise impair the efficiency or appearance of the structure. No excavated material shall be deposited at any time in such a manner as to endanger a partly finished structure.

The Contractor shall handle and deposit excavated materials in such a manner as to furnish proper protection to materials which will be incorporated in the structure.

In streams, the disposal of material will be subject to the laws of the U.S. Government and requirements set out in the TN Construction General Permit and any other applicable environmental permits.

Subsection 204.09-Protection of Excavation. Replace the entire subsection with the following:

204.09-Protection of Excavation. The Contractor will be held responsible for protecting his excavation and shall take every precaution to maintain the excavation intact.

Cofferdams or cribs, used in the preparation and protection of the foundation, in general, shall be carried well below the bottom of the footings, shall be substantially braced in all directions; and shall be of such construction as will permit them to be pumped and maintained free of water until the construction therein has been completed. All dewatering of work areas of must comply with the requirements of the TN Construction General Permit and shall not cause a water quality violation. Unless otherwise specifically indicated on the Plans, the interior dimensions of the cofferdam will be such as to give sufficient clearance to provide for the construction and inspection of forms; and to provide for the handling and pumping of leakage outside of the footing area. Cofferdams or cribs which tilt or move out of position during the process of sinking shall be righted or enlarged in order to provide the necessary clearance.

Cofferdams or cribs shall be so constructed as to protect the foundation and the construction therein against damage from a rise in the stream.

Timber, or bracing of a cofferdam or crib may extend into or through the substructure only with the written permission of the Engineer, obtained before the construction of the cofferdam or

crib has been started. In addition, the cofferdams for structure widening shall not be braced off of the existing structure.

The Contractor shall submit drawings, prepared by and stamped by a Professional Engineer licensed in Tennessee, showing details of his proposed cofferdam, or crib construction to the Engineer, prior to starting any work. The type and clearance of cofferdams, or cribs, insofar as they affect the finished structure or part thereof, will be subject to the approval of the Engineer but the design and successful construction shall be the responsibility of the Contractor. Work in a stream shall not begin until applicable permits from state and federal agencies have been obtained. Coffer dam construction shall be in accordance with the requirements of the permit(s).

Cofferdams or cribs, with all falsework, sheeting, bracing, etc. shall be removed by the Contractor after the completion of the sub-structure therein, unless otherwise directed. The removal shall be affected in such a manner as not to disturb nor mar the completed work.

If the foundation excavation has become disturbed or distorted, it shall be cleaned out and restored to satisfactory condition at the Contractor's expense.

Subsection 204.10-Foundation Preparation. Replace the entire subsection with the following:

204.10-Foundation Preparation.

(a) Bridges, Box Culverts, and Other Major Structures.

The preparation of foundations for bridges, box culverts and other major structures, in addition to the stipulations set out in **Subsections 204.08** and **204.09**, shall be in accordance with the following:

When the foundation has been completed to foundation elevation as given, the Engineer shall be notified and the construction therein withheld pending his inspection and approval of the foundation.

When directed by the Engineer, unless piles are indicated, the Contractor shall test each foundation in the presence of the Engineer, by sinking not less than 3 holes, or more than 6 holes to a depth of between 6 and 10 ft. (1.8 and 3 m) in order to verify the apparent conditions of the foundations.

Should these test holes disclose unsatisfactory foundation conditions, the excavation shall be carried lower, as directed by the Engineer, and new tests made, until a satisfactory foundation is secured. The costs incurred in sinking test holes will not be paid for directly but shall be included in the price bid for other items of construction unless specified otherwise on the Contract drawings.

When rock is encountered in the excavation for the foundation, it shall be cleared off and the Engineer notified. Test holes shall then be drilled in the rock as shown on the Plans or directed by the Engineer to determine the lines of demarcation, the classification and the stability of the rock. The excavation shall then be continued to the elevation designated by the Engineer and test holes, if required by the Engineer, shall again be drilled and excavation continued until a foundation approved by the Engineer is secured.

Rock used as foundation shall be stripped and cleaned of all overlying materials. All loose, disintegrated, or light slabby portions of the rock shall be removed.

In rock foundations, when the rock is shattered below the foundation elevation, the shattered material shall be removed and the space so created rebuilt with the same type of

construction as the proposed overlying construction. The additional quantities thus made necessary shall not be included in the pay quantities for this item.

When the Plans indicate that piles shall be driven, or if after the foundation excavation has been completed it becomes necessary to reinforce the foundation by driving piles therein, any bulge of the foundation material, caused by the driving of the piles, shall be removed at the Contractor's expense, to the elevation indicated or directed and the foundation trued to an even surface over its entire area.

Unsatisfactory material in the foundation shall be removed and replaced with satisfactory material designated by the Engineer. This material shall be placed in layers not exceeding 6 in. (15 cm) in loose depth and compacted to 100 % of maximum density up to the foundation elevation.

Any pumping that may be permitted from the interior of any foundation enclosure shall be done in such a manner as to preclude the possibility of any portion of concrete material being carried away. Any pumping required during the placing of concrete, or for a period of at least 24 hours thereafter, shall be done from a suitable sump located outside the concrete forms. All dewatering of work areas must comply with the requirements of the TN Construction General Permit and shall not cause a water quality violation.

When conditions are encountered which render it impracticable to dewater the foundation before placing the footing, the Engineer may permit the construction of a concrete foundation seal of such dimensions as he may consider necessary and of such thickness as to resist any possible uplift. Before pouring the seal, the foundation shall be cleaned of all objectionable material by the use of sand pumps, spud bars or other means which will accomplish the purpose satisfactorily. The seals shall then be constructed in accordance with the provisions of **Subsection 604.19.** Pumping to dewater a sealed cofferdam shall not commence until the seal has set sufficiently to withstand the hydrostatic pressure. The foundation shall then be dewatered and the seal thoroughly cleaned of all laitance and generally prepared for further construction.

Measurement and payment for concrete foundation seal will be as provided for under **Subsections 604.31** and **604.32** except as provided for in 204.13.

(b) Pipe Culverts.

Bedding for pipe culverts shall conform to the requirements given below for Class A, B, or C bedding, whichever is shown on the Plans or in the special provisions. If the class of bedding is not shown, Class C bedding shall be placed.

Class A bedding for pipe culverts shall consist of a continuous concrete cradle constructed in conformity with the details shown on the Plans and the applicable requirements of **Section 604** (Concrete Structures).

Class B bedding shall be constructed by bedding the culvert pipe in a trench cut in natural ground or compacted embankment to a depth as shown on the Plans. The pipe shall be bedded on a 6 in. (15 cm) thickness of Class B Material and sufficient additional Class B material accurately shaped by a template to fit the lower part of the pipe exterior for at least 10% of its overall height. Class B material shall then be rammed and tamped in layers not over 6 in. (15 cm) in loose thickness around the pipe to a minimum depth of that shown on the Plans. The remaining depth of trench shall then be backfilled and compacted as outlined in **Subsection 204.11(b)**. When bell and spigot pipe is to be placed, recesses shall be dug in the bedding material of sufficient width and depth to

accommodate the bell without its resting on the bottom of the recess. The width of the recess shall not exceed the width of the bell by more than 2 in. (50 mm).

When plastic pipe is to be placed, the bedding and backfill shall be granular compactable Type "A" or Type "B" Aggregate, Grading D or E material meeting the requirements of **Subsection 903.05**. Open graded aggregates will not be allowed. A minimum of 6 inches of bedding compacted to a minimum 90% Standard Proctor Density shall be provided prior to placement of the pipe unless otherwise specified.

Class C bedding shall be constructed by bedding the culvert pipe in a shallow trench cut in natural ground or compacted embankment to a depth of not less than 10% of the outside vertical pipe diameter, and shall be shaped to fit the lower pipe exterior for the specified embedment. When bell and spigot pipe is to be placed, recesses shall be dug in the earth foundation of sufficient width and depth to accommodate the bell without its resting on the bottom of the recess. The width of the recess shall not exceed the width of the bell by more than 2 in. (50 mm).

When flowable fill is required by the plans, class B bedding shall be constructed by bedding the culvert pipe in a trench cut in natural ground or compacted embankment to a depth as shown on the Plans. The pipe shall be bedded on a 6 in.(15 cm) thickness of Class B Material and sufficient additional Class B material accurately shaped by a template to fit the lower part of the pipe exterior for at least 10 % of its overall height. Flowable fill shall then be placed around the pipe as specified in **Subsection 204.11(c).**

Subsection 204.11 Backfilling, (b) Pipe culverts. **Add** The following as the third paragraph:

"When plastic pipe is to be placed, structural backfill must be worked into the haunch area and compacted by hand after placement of the pipe. Special compaction means may be necessary in the haunch area. Structural backfill may then be placed in layers not to exceed an 6 inch loose lift thickness and brought up evenly and simultaneously on both sides of the pipe to an elevation not less than one foot above the pipe. A minimum compaction level of 90% Standard Proctor Density per *AASHTO T99* shall be achieved by the use of a vibratory plate. Hydrohammer type compactors shall not be used over the pipe. All compaction equipment used shall be approved by the Engineer."

204.12-Method of Measurement. Add the following as the last paragraph:

"Payment for Type "A" or Type "B" backfill including bedding material will be included in the unit price of the pipe."

204.13-Basis of Payment, (h) Concrete for Class A Bedding. **Remove** paragraph and **replace** with the following:

"Payment for Type "A" bedding material will be included in the unit price of the pipe unless otherwise provided in the plans. If specified by the plans, concrete for Class A Bedding will be paid for at the contract unit price per cubic yard (m3) for Bedding Material (Pipe) Class A, complete in place."

204.13-Basis of Payment, (i) Material for Class B Bedding. **Remove** paragraph and **replace** with the following:

"Payment for Type "B" bedding material will be included in the unit price of the pipe unless otherwise provided in the plans." If specified by the plans, material for Class B Bedding will be

paid for at the contract unit price per cubic yard (cubic meter) for Bedding Material (Pipe) Class B, complete in place.

204.13-Basis of Payment, (l) Backfill Material (Flowable Fill). **Add** the following as the last paragraph:

"Payment for "Flowable Fill" as backfill material for pipe shall be included in the unit price of the pipe unless otherwise provided in the plans."

Subsection 205.01 Description. Revise the entire subsection to the following:

205.01-Description. This work shall consist of constructing roadway embankments, including preparation of the area upon which they are to be placed; the construction of dikes within or outside the rights-of-way; the placing and compacting of approved material within roadway areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits, and other depressions within the roadway area all in accordance with these Specifications and in reasonably close conformity with the lines, grades, and typical cross sections shown on the Plans or established by the Engineer. Only approved materials shall be used in the construction of embankments and backfills. These materials shall consist of Road and Drainage Excavation, Channel Excavation, and Borrow Excavation material described in **Section 203**, or excess material as described in **Section 204**.

The Contractor must identify both natural and created steep slope areas as defined in the TN Construction General Permit. These slopes must be marked in the SWPPP. Maintenance and stabilization of steep slopes must comply with the TN Construction General Permit and any other applicable environmental permits.

Subsection 205.04 Insert the following, between the fifth and sixth paragraph:

"Where the contract includes the placement of base stone or other components of a pavement structure upon the subgrade, the top 6 in. (150 mm) in both cut and fill sections shall be compacted to a density equal to 100 percent of the maximum density in accordance with the provisions of **Subsection 207.04.**"

Subsectin 206.03-Method and Scope of Work. Revise the entire subsection to the following:

206.03-Method and Scope of Work. Final Dressing shall be performed by hand work and machines to produce a uniform satisfactory finish to all parts of the roadway and other components of the project. The roadbed, shoulders, ditches and slopes shall be shaped within reasonably close conformity to the specified lines, grades and cross sections. Spoil banks, borrow areas, waste areas, etc. shall be dressed in a satisfactory manner in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. Rock cuts shall be scaled of all loose fragments and left in a neat, safe and workmanlike condition.

The entire rights-of-way shall be cleaned of all weeds, briars and brushes unless otherwise specified on the Plans. All structures, both old and new, shall be cleared and cleaned of all brush, drifts, heavy vegetation, sediment, rubbish, obstructions and other objectionable material.

Final dressing shall be performed prior to sodding and seeding operations when these construction items are included in the Contract.

Tracked machines used in the dressing of slopes shall be run up and down slopes as opposed to longitudinally.

Section 209, Revise Section title to the following:

SECTION 209-PROJECT EROSION PEVENTION AND SEDIMENT CONTROL

Subsection 209.01, Revise entire Subsection to the following:

209.01-Description. This work shall consist of temporary and permanent best management practices to prevent erosion and control sediment through the use of structural and non-structural controls.

Erosion prevention and sediment control (EPSC) measures shall be implemented during all phases of construction, including all approved waste and borrow areas. EPSC measures shown on the Stormwater Pollution Prevention Plan (SWPPP) must be in place before any soil disturbing activities begin.

The Contractor must identify both natural and created steep slope areas as defined in the TN Construction General Permit. These slopes must be marked in the SWPPP. Management and stabilization of steep slopes must comply with the TN Construction General Permit and any other applicable environmental permits.

In addition to installing the EPSC measures included in the SWPPP, the Contractor is responsible for compliance with all other provisions of the SWPPP. Additional EPSC measures beyond those shown in the SWPPP may be required to maintain compliance with permits

Subsection 209.02, Revise Subsection to the following:

209.02-Classification. Structural and Non-Structural best management practices will be classified in accordance with manual for Management of Storm Water Discharges Associated with Construction Activities. Best management practices are structural and non-structural controls required for the project and shall be implemented in accordance with the TN Construction General Permit, Manual for Management of Storm Water Discharges Associated with Construction Activities, the project Stormwater Pollution Prevention Plan, and Roadway Standard Drawings, whichever is more restrictive.

Subsection 209.04, Revise entire Subsection to the following:

209.04-Project Review. Prior to the preconstruction conference the Contractor shall meet with the Engineer to discuss potential problems with erosion prevention and sediment control due to construction activities and actions to be taken to prevent such problems. Should the Contractor's operations and construction staging differ significantly from the SWPPP prepared for the project, the Contractor shall prepare a comprehensive SWPPP in accordance with **Subsection 209.05** below that does not conflict with the requirements of the TN Construction General Permit, the conditions of any ARAP for the project, or other environmental permits. The SWPPP shall be continuously implemented to effectively control erosion and protect streams, wetlands, and adjoining properties during the term of the contract.

If it is determined that a waste or borrow area is needed, the Contractor shall prepare a waste and borrow plan in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Subsection 209.05, Revise entire Subsection to the following:

209.05-Preconstruction Conferences. Each project will have a preconstruction conference. In addition to the preconstruction conference, for sites that have environmental permits, an environmental preconstruction conference will be held. These conferences can be held jointly or separately, as determined by the Project Supervisor.

At the preconstruction conference the Contractor shall submit for acceptance his plan for the staging of his operations. If the staging plan requires additional erosion prevention and sediment control measures or causes the existing SWPPP for the project to be modified, the Contractor shall submit these modifications to the project Supervisor and discuss the modificaitons during the preconstruction conference. The staging plan must address: (1) All areas within the rights-of-way as are applicable for clearing and grubbing, grading, bridges and other structures at water courses, paving and incidental construction (2) Areas outside the rights-of-way that will be disturbed by the construction such as waste and borrow areas (which must have an approved waste and borrow plan and be properly permitted), haul roads, utilities, and staging areas, and utility work in general. The Contractor's modified SWPPP shall incorporate and supplement, as applicable, the basic control devices shown in the plans to provide acceptable temporary and permanent erosion prevention and sediment controls during all stages of construction as well as to comply with all applicable environmental permit conditions. The Contractor's modified SWPPP shall include controls for managing and stabilizing natural and created steep slope areas as defined in the TN Construction General Permit. No work shall be started until the erosion prevention and sediment control plan, including the staging of temporary and permanent erosion control measures, has been accepted by the Engineer. Rejection of all or part of the plan shall not constitute a basis for an extension of contract time.

The Project Supervisor and Contractor will discuss how utilities are to be managed on the project, specifically if the utilities are within the Construction contract or are separate from the Construction contract. The Prime Contractor will coordinate a start date for utilities with the Project Supervisor if utility work will begin before the project start date. Unless approved in advance by the Project Supervisor, utilities that are within the Construction contract cannot begin construction on the project until the Project Supervisor has approved the work.

The erosion prevention and sediment control plan shall be updated as work progresses to show changes due to revisions in work schedules or sequence of construction, or when directed by the Engineer. Additional measures shall be installed in the field as needed to manage erosion and sediment and to prevent pollutants from discharging into waters of the state or off the project.

An environmental preconstruction conference will also be held prior to beginning construction on sites that have environmental permits. The environmental preconstruction conference will include a review of the project's environmental permits and any additional environmental commitments required for the project. This meeting will discuss the required marking of clearing limits and the marking of sensitive environmental areas per any applicable environmental permits. The Contractor will discuss potential problems with implementing the requirements of any environmental permits due to construction activities. The Contractor shall also discuss actions to be taken to prevent conflicts between environmental permits and construction activities.

Subsection 209.06, Revise entire Subsection to the following:

209.06-Construction Requirements. Disturbed area limits and environmental boundaries shall be marked in the field prior to construction in each section or portion of the project. Prior to or simultaneously with the clearing and grubbing operations, the Contractor shall install erosion prevention and sediment control devices in accordance with the approved SWPPP. Such work may involve the construction of temporary berms, dams, silt fences, sediment basins, lined channels, permanent cut-off ditches, slope drains or other control devices as necessary to prevent and control erosion. Water from cofferdams or other dewatering activities is not to be pumped directly into streams, but is to be pumped into sediment basins, traps, or filter bags or otherwise adequately treated prior to discharging. No grading shall be performed until the erosion prevention and sediment control devices are in place to the satisfaction of the Engineer. Areas to be graded may be cleared and grubbed prior to beginning grading operations in accordance with the TN Construction General Permit, provided adequate controls are in place. Stockpiled topsoil or fill material is to be protected so the sediment runoff will not contaminate surrounding areas or enter nearby streams. In order to reduce sediment in runoff, erosion prevention and sediment control structures shall be installed promptly during all construction phases and maintained until the areas they are serving have been permanently stabilized.

The Contractor must identify both natural and created steep slope areas as defined in the TN Construction General Permit. These slopes must be marked in the SWPPP. Management and stabilization of steep slopes must comply with the TN Construction General Permit and any other applicable environmental permits.

The Contractor's operations shall be staged so that graded or otherwise disturbed erodible surfaces are protected as the work progresses. Once the Contractor begins grading for a roadway cut or embankment, he shall maintain a continuous, viable operation to complete the cut or embankment to subgrade elevation, unless otherwise approved in writing by the Engineer. Exposed erodible cut or embankment slopes shall be final dressed, topsoiled and protected with permanent seeding, sodding, matting or other acceptable erosion prevention and sediment control measures in vertical increments not exceeding 25 ft. (7.5 m) as the work progresses; and no portion of these slopes shall remain unprotected longer than allowed by the TN Construction General Permit unless the Engineer determines that weather conditions or other special circumstances preclude current placement of permanent control measures. Temporary erosion control measures shall be implemented as directed by the Engineer.

Seeding, sodding, matting or other acceptable erosion prevention and sediment control operations shall be initiated within 48 hours after any one of the following conditions occurs:

1. Each 25 ft. (7.5 m) vertical increment is graded or
2. Upon suspension or completion of grading operations in a specific area.

The above requirements for progressive erosion prevention and sediment control, as well as additional requirements, also apply to graded areas off the rights-of-way such as waste areas, borrow areas and haul roads. A borrow and waste site plan must be developed for any waste or borrow area selected according to Statewide Storm Water Management Plan – Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects.

The Contractor shall incorporate all permanent erosion prevention and sediment control practices into the project at the earliest practicable time and in accordance with the TN Construction General Permit requirements. Temporary erosion prevention and sediment control features shall be used to control erosive conditions that warrant protection prior to installation of

permanent control features or that are needed to temporarily control erosion that develops during construction but which is not associated with permanent control features on the project. Temporary stabilization of disturbed areas shall be in accordance with the requirements of the TN Construction General Permit.

Where construction activities cross or border areas of depression (i.e. Sinkholes without openings or open throats), erosion prevention and sediment control measures shall be installed and maintained as shown in the plans and as required by the TN Construction General Permit and any other applicable environmental permits.. When construction activities encounter an open throated sinkhole (Class V Injection Well), the Engineer shall be notified immediately and applicable measures as described in the approved SWPPP shall be employed. The measures mentioned above shall encircle the sinkhole opening so as not to allow any silt or other potential pollutants to enter the opening.

In the event of conflict between these requirements and TN Construction General Permit, rules or regulations of other Federal or State or local agencies, the more restrictive laws, rules or regulations shall apply.

Subsection 209.07-Construction of Structures. Revise entire subsection to the following:

209.07-Construction of Structures Structural controls include, but are not limited to, bonded fiber matrix, riprap, inlet protection, check dams, silt fence, and sediment basins. Structural measures shall be installed and maintained in accordance with the Manual for Management of Storm Water Discharges Associated with Construction Activities, TN Construction General Permit, and the Roadway Standard Drawings.

Erosion prevention and sediment control measures shall be installed as indicated on the Roadway Standard Drawings, except as follows:

(a) **Sediment Filter Bags.**

The sediment bags may be utilized either on slope drains, pipe culverts, box bridges, or for pumping sediment from sediment traps and sediment basins. This activity shall be performed as shown on plans or as directed by the Engineer. The material shall be a non-woven geotextile fabric bag resistant to rot, mildew, puncture and tearing, with a minimum seam breaking strength of 200 lbs (90 kgs) the seams shall demonstrate less elongation and Deformation of the geotextile fabric. The Division of Materials and Test will certify the fabric for the Temporary Sediment Filter Bags and place them on the Department's Qualified Products List. Temporary Sediment Filter Bags shall meet the following specifications.

GEOTEXTILE FABRIC SPECIFICATIONS

Properties		Test Method
Weight	10.0 oz/yd	ASTM D 3776
Tensile Strength	250 lbs.	ASTM D 4632
Tensile Elongation at Break	50%	ASTM D 4632
Puncture Strength	115 lbs.	ASTM D 4833
Trapezoidal Tear	100 lbs.	ASTM D 4533
Mullen Burst	350 lbs.	ASTM D 3786

Water, Flow Rate	80 gpm/ft.2	ASTM D 4491
Permittivity	1.2 sec.-1	ASTM D 4491
UV Resistance	70% str. Ret.	ASTM D 4355

Standard Bag Minimum Dimensions
15 x 10 ft. and 15 x 15 ft.

Maximum Flow Rate
15 x 10 ft. up to 1,500 gpm
15 x 15 ft. up to 2,000 gpm

A manufacturer's label designating the maximum allowable flow rate of the bag in gallons per minute shall be permanently attached to each bag. The flow into the filter bag shall not exceed the designated flow rate. Care shall be taken to correctly connect the filter bag to the pump hose, as recommended by the manufacturer. Upon project completion, the sediment filter bag shall be completely removed and the disturbed areas at the dewatering structure location shall be permanently stabilized. The bag and sediment contained in the bag shall be disposed as directed by the Engineer.

(b) Sandbag Berms and Temporary Plugs.

Sandbag berms and temporary plugs may be used for velocity control, runoff management, sediment control and separating streamflow from work areas. These sandbag measures should not be used for filtration. Sandbag berms and temporary plugs should not be used in high concentrated flow areas where the sand bags may be displaced by flow. Sandbags should not be used in areas where equipment and/or traffic may damage the bags. The ends of sandbags must be tightly abutted and overlapped to direct flow away from bag joints.

Sandbags for the sandbag berms and channel plugs shall be made of durable, weather resistant geotextile fabric. Use of burlap is not acceptable for sandbags used in sandbag berms and temporary plugs. The bag fabric pores must be tight enough to retain the bag filler material. Typical bags measure approximately 24 inches x 12 inches x 6 inches. The sandbag fill material shall be a clean non-cohesive sand material.

Where sandbags are used to construct sandbag berms or temporary plugs across a ditch or channel, the sandbags should be installed along a level contour. The sandbags at the ends of the measure should be turned upstream.

Sandbag berms may be installed in both unpaved and paved ditches and channels. The sandbag berm must be wider than the high water mark of the ditch or channel to prevent undercutting. The center of the sandbag berm must be lower than either of the edges. For multiple sandbag berms installed in ditches, the maximum spacing between the berms should be such that the toe of the upstream sandbag berm at the same elevation as the top of the downstream sandbag berm.

Sandbag temporary plugs are constructed to separate stream flow from work areas, especially for projects requiring temporary diversions. Sandbag temporary plugs shall be constructed as required for the temporary diversion. The temporary plugs should be constructed as appropriate to be free of leaks between the bags.

Sandbags shall be removed and replaced if bags become torn or damaged to prevent the bag filler material from becoming a stormwater pollutant. Remove any sediment accumulations at sandbags when the sediment accumulation has reached half the original height of the sandbags. Where the ends of sandbag structures are breached, place new bags in the breach and extend the ends of the berm to a higher elevation. If needed, repair the bank damage. Where sandbags are undermined, do not repair the sandbags in place as additional undermining may occur. Move the sandbags downstream of the damaged location.

Upon project completion, all sandbags shall be removed and any disturbed areas underlying the sandbags shall be permanently stabilized with measures such as permanent seed and mulch.

(c) Flocculants .

This work shall consist of furnishing and applying flocculant materials for controlling erosion on disturbed areas and for use with sediment control devices for the purpose of reducing turbidity from stormwater runoff. Flocculant materials shall be manufactured and applied in strict accordance with the Specifications herein.

Equipment

All equipment necessary for the satisfactory performance of this work shall be on the project and approved, before work will be permitted to begin.

If using a liquid application system, it may be necessary to pump a surfactant through the delivery system prior to liquid flocculant injection and afterwards in order to prevent clogging of pipes and valves.

After application of flocculant materials, all equipment used for application shall be cleaned per the flocculant manufacturer's recommendations in order to prevent the formation of dried residues that may impede future equipment performance.

Applications of dry flocculant materials shall be performed with a hand-held fertilizer spreader or a tractor-mounted spreader. If approved by the flocculant manufacturer, the mixing of certain dry flocculants with dry silica sand will aid in the spreading of flocculant material.

Limitations

Cationic PAM blends will not be approved for use and shall not be applied in any circumstance due to aquatic toxicity.

Flocculants shall never be applied directly to streams, wetlands, or other natural water resources. Flocculants shall never be applied directly to sediment ponds. Flocculants applied to any area of the construction site, including slopes, shall be applied in such a manner so that all flocculant-applied runoff flows into a sediment trap, sediment pond, or series of multiple sediment-control BMPs prior to discharge from the site. Flocculants shall not be applied to slopes that produce runoff directly into a stream, wetland, or other natural water resource. Flocculants for both erosion and sediment control shall always be used in conjunction with approved stormwater BMPs, as given in the TDOT Standard Drawings.

Dry flocculant applications must be applied in dry weather conditions with light winds. Anionic PAM shall not be applied during rainfall or onto saturated soils.

All flocculant applications shall be applied at least 60 feet from any stream, wetland, or other natural water resource located on or adjacent to the construction site.

Emulsion forms of coagulant/flocculants should never be applied directly to stormwater runoff or to streams, wetlands, or other water resources due to surfactant toxicity. Emulsions may only be used in the preparation of liquid flocculants specifically used for erosion control applications, i.e., soil binders and tackifiers.

Preparation of Treatment Areas

Prior to use of flocculants, site-specific soil samples must be obtained and tested to identify the optimum flocculant blends to use for effectiveness. The Contractor shall provide site specific soils from given construction site to select an appropriate and effective flocculant blend for dry, liquid, emulsion, and brick/log flocculant materials. Soil samples must be obtained from each soil horizon to be accessed during excavation.

Application Requirements

Flocculants shall be used in conjunction with other BMPs (with the bulk of structural sediment-control BMPs, including sediment ponds, positioned down slope of the flocculant-application areas) to increase flocculant performance. Stormwater runoff from flocculant-treated soils shall be directed to pass through a series of sediment control BMPs prior to discharge to surface waters, with flow passing through, at least, a minimum of 3 enhanced rock check dams and a silt trap. It is preferable that runoff from flocculant-treated areas be directed into a sediment pond.

Flocculant materials shall be stored in covered areas. Many flocculants demonstrate a decrease in effectiveness after exposure to sunlight and air. Anionic PAM loses its effectiveness within three months after exposure to sunlight and air. Anionic PAM as well as certain other flocculant materials, when combined with water, become very slippery and can produce a safety hazard. Care must be taken to prevent spills of flocculants, in liquid, emulsion, or powder form, onto paved surfaces.

Application of flocculants will be most effective when applied as follows:

a) During rough grading operations;

b) On stockpiles and borrow areas;

c) Temporary haul roads before placement of crushed rock surface;

d) Compacted soil road base;

e) After final grading and before paving and/or final seeding;

f) Along the interior surface area of ditches;

g) Sites where work has been temporarily suspended (e.g., winter shutdown), and

h) Areas that will be mulched.

Flocculants should not be applied over surfaces of pure sand or gravel with no fines and should not be applied over snow cover.
The use of a visible tracer or colorant to visibly track flocculant application is recommended.

Liquid applications of flocculants will require the use of source water for mixing with a low turbidity (20 NTUs or less).

For turbidity reduction within sediment ponds, apply flocculants to conveyance ditches above the pond that discharge into the pond. Flocculants shall not be applied directly to pooled water within sediment ponds.

For **dewatering** and suspended solids removal of turbid pooled water within pipe tranches, silt traps, or other areas, flocculants may be introduced, in either liquid or solid forms, into the turbid water during pumping/evacuation of the pooled water. The pumping will provide turbulence for optimum mixing, with the discharge either pumped through a filter bag or jute-lined treatment ditch prior to ultimate discharge. Application rates as given in this specification for turbidity reduction for anionic PAM (and as given by the manufacturers' requirements for other types of flocculants) shall be strictly followed during dewatering.

Application requirements for the two main classifications of flocculants are as given below:

I. Anionic Polyacrylamide

Prior to use of any flocculant, the flocculant manufacturer's written application, storage, and mixing requirements and specifications shall be supplied to both TDOT and the Contractor. Anionic PAM shall be stored, handled, mixed and applied in strict accordance with the flocculant manufacturer recommendations and in strict compliance with OSHA Material Safety Data Sheet requirements, complying with all applicable federal, state, and local regulations. Proper personal protective equipment shall be used when handling the flocculant per industry, manufacturer, state, and federal regulations.

SPECIAL CARE SHALL BE GIVEN TO THE APPLICATION RATES FOR ANIONIC PAM SPECIFIED HEREIN TO ENSURE THAT THE MAXIMUM APPLICATION RATES ARE NEVER EXCEEDED. ADDING ADDITIONAL PAM BEYOND THE RATES SPECIFIED WILL NOT IMPROVE THE EFFECTIVENESS OF PAM BUT COULD PRESENT TOXICITY ISSUES TO RECEIVING STREAMS DOWN GRADIENT OF THE PAM APPLICATION ZONE.

For erosion control applications on sloped areas:

a) With hydroseeding applications, anionic PAM should be added as the last component to the hydroseeding mixture. When mixing, the Contractor shall never add water to anionic PAM. The Contractor shall add PAM at a slow rate to water. Mixing of anionic PAM for hydroseeding shall include agitation of the PAM/water mixture. The application method chosen must ensure uniform flocculant coverage to the target area.

b) The Contractor shall never use anionic PAM as the sole erosion control method for slopes; slope applications of PAM shall be accompanied with mulching.

c) For PAM tackifiers, dry PAM shall be dissolved with a known quantity of clean water in a container for several hours (preferably overnight.) PAM is to be applied at a rate in the range of 0.5 lb to 1.0 lb (maximum) per 1,000 gallons of water per acre application area via a hydro- mulch machine.

d) For soil binder applications, the Contractor shall dissolve pre-measured dry PAM with a known quantity of clean water in a container for several hours (preferably overnight.) PAM is to be applied at a rate range between 2/3 lb to 1 lb (maximum) PAM per 1000 gallons water per acre of bare soil.

e) Emulsion batches shall be mixed per the recommendations of the flocculant manufacturer to determine the proper product type and application rate to meet site-specific requirements. The chosen application method must ensure uniform coverage of the target application area.

f) When using an emulsion form of anionic PAM to slopes, apply no greater than 1.5 gallons emulsion per acre per event. Solution mixtures shall be 1.5 gallons (maximum) anionic PAM emulsion per 3000 gallons of water. Note: Water volumes that are less than 3000 gallons of water shall not be used due to increased viscosity issues.

g) The Contractor shall **s**pray the anionic PAM/water mixture uniformly across the dry soil slope until completely wetted.

h) For dry anionic PAM applications for erosion control, anionic PAM shall be applied as a powder at the following rates:

- For slopes less than 25% - Apply at 10 lbs per acre (maximum)
- For slopes greater than or equal to 25% - Apply at 20 lbs per acre (maximum)

i) Liquid anionic PAM for erosion control shall be reapplied on actively worked areas after a 48-hour period.

j) Liquid anionic PAM shall not be applied to the same slope area more than once in a 48-hour period and no more than 7 times in a 30-day period.

k) For inactive slope areas where anionic PAM has been applied, a reapplication shall be required once every two months.

l) **Note: Anionic PAM applications (dry or liquid) shall not exceed 200 lbs/acre per year.**

For turbidity reduction within ditches:

a) It is highly recommended that flocculant application be applied as erosion control in the watershed above the treatment ditches in conjunction with the application of flocculants within treatment ditches for turbidity control.

b) The surface area of stormwater ditches, as well as the surface area of ditch check dams, shall be lined with jute mesh.

c) Dry powder anionic PAM shall be applied over the jute mesh at a rate of 0.25 lb to 0.5 lb per 1000 square feet of ditch surface area.

d) Dry powder anionic PAM shall be re-applied to jute mesh in ditches every 3 to 5 storm events. **Dry anionic PAM application shall not exceed 4.6 lbs/1000 square feet per year.**

e) Anionic PAM bricks/logs shall be of appropriate size, shape, and number to deliver the appropriate dosage to the water within the conveyance. The flocculant manufacturer shall be consulted to provide brick/log dissolution rates and dosages.

f) Anionic PAM bricks/logs shall be located in a shaded, preferably moist, installation zone during application.

g) Anionic PAM bricks/logs shall be placed near the main flow area of the ditch, and they shall be placed at an appropriate distance above sediment ponds or traps to maximize mixing and flocculation. The manufacturer shall be consulted to provide guidance for flocculant mixing time required and block/log spacing configurations.

h) The Contractor shall install one anionic PAM brick/log for every 65 to 70 gpm of flow to be treated, unless otherwise specified by the flocculant manufacturer.

i) Unless otherwise specified by the flocculant manufacturer, anionic PAM bricks/logs are estimated to treat, on average, 475,000 to 550,000 total gallons of flow volume.

j) Stakes, mesh bags, cages, and other mechanisms to anchor bricks/logs in place shall be carefully installed to provide stability during flows and to maximize exposure of the brick/log surface area to flows.

k) Anionic PAM bricks/logs shall be replaced at least every 3 - 4 months or earlier if bricks/logs have excessive sediment/debris deposition on the outer brick/log surface area or excessive degradation of brick/log mass.

II. Miscellaneous Coagulant/Flocculant Materials

Miscellaneous flocculant materials shall include all other flocculants that are not polyacylamide blends and that have been pre-approved for use on TDOT projects through the TDOT Materials and Testing Division. Submittals of required information as given in the ***Materials*** and ***Classifications*** sections of this specification shall be strictly followed.

Prior to use of any flocculant, the manufacturer's written application, storage, and mixing requirements and specifications shall be supplied to both TDOT and the Contractor. Flocculants shall be stored, handled, mixed and applied in strict accordance with the flocculant manufacturer recommendations and in strict compliance with OSHA Material Safety Data Sheet requirements, complying with all applicable federal, state, and local regulations. Proper personal protective equipment shall be used when handling the flocculant per industry, manufacturer, state, and federal regulations.

Special care shall be given to the application rates for flocculants specified by the manufacturer to ensure that the maximum application rates are never exceeded.

For erosion and sediment control applications for sloped areas and ditches:

a) The Contractor shall strictly follow the manufacturer's requirements for application mixtures and rates.

b) With hydroseeding applications, flocculants shall be mixed in strict accordance with manufacturers written recommendations, as provided to TDOT and the Contractor.

c) Flocculants shall not be used as the sole erosion control method for slopes; slope applications of flocculants shall be accompanied with mulching. Flocculant use for turbidity reduction in ditches shall be used in conjunction with other structural sediment-control BMPs.

d) Re-application frequency and rates shall strictly follow manufacturer's written recommendations, as provided to TDOT and the Contractor.

e) Storage of flocculants shall follow manufacturers written requirements, as provided to TDOT and the Contractor.

Documentation and Maintenance

Flocculants will enhance the deposition of soil solids in downstream ditches, pipes, and ponds. These hydraulic structures shall be inspected regularly with solids routinely removed from these structures to ensure optimization of performance.

The Contractor shall provide suitable means for storing and protecting flocculants against moisture and sunlight.

TDOT field personnel shall maintain records of all flocculant applications including the following information:

a) Date, time, and specific location of application;

b) Rates of application;

c) Method of application;

d) Weather conditions, and

e) Type of flocculant applied including manufacturer name and product name.

Final Cleanup

The Contractor shall clean liquid or dry flocculant spills per the manufacturer's requirements. Flocculant mixing and application equipment shall be rinsed thoroughly with water to prevent the formation of residues. Unused flocculant mixtures should be minimized. Rinse residues can be applied to exposed slopes for erosion control. The Contractor shall dispose of excess flocculant material in compliance with federal, state, and local environmental regulations. Excess material shall not be disposed within stormwater conveyances, sewers, or streams.

The Contractor shall install and maintain all temporary erosion prevention and sediment control features and pollution prevention measures until no longer needed or permanent control measures are installed. Any materials removed shall become the property of the Contractor. In order to insure erosion prevention and sediment control structures work properly, it is imperative the sediment be removed and structural components of the measures maintained; therefore, inspection and maintenance of structures is to be performed on a regular basis. During sediment removal, the Contractor shall take care to insure that structural components of erosion prevention and sediment control structures are not damaged and thus made ineffective. If damage does occur, the Contractor shall repair the structures at his own expense. Upon complete removal of sediment traps, special ditches, etc., the area where they were constructed is to be topsoiled, seeded and mulched or otherwise stabilized.

In the event that temporary erosion prevention and sediment control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of work as scheduled, and are ordered by the Engineer, such work shall be performed by the Contractor at his own expense. (See special provisions 107FP if applicable)

Where temporary erosion prevention and sediment control or pollution prevention work is acceptably performed and failure of all or any part of the system occurs but is not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls and falls within the specifications for a work item that has a contract price, the units of work will be paid for at the proper contract prices except as noted below. Should the temporary erosion prevention and sediment control or pollution prevention work not be comparable to the project work under the applicable contract items, the Contractor shall be ordered to perform the work on a force account basis, or by agreed unit prices in compliance with **Subsection 109.04**.

Except as noted below, payment also may be made for replacement of temporary erosion prevention and sediment control and pollution prevention devices installed according to the plans or as approved by the Engineer provided such devices are no longer effective because of deterioration or functional incapacity, except that no payment shall be made for replacement of erosion prevention and sediment control or pollution prevention devices ineffective due to improper installation, lack of reasonable maintenance or because of failure of the Contractor to pursue timely installation of permanent control devices in accordance with the Plans and Specifications or as directed by the Engineer.

Unless provided for on the plans, no direct payment will be made for temporary and permanent erosion prevention and sediment control or pollution prevention measures in disturbed areas outside the rights-of-way such as borrow areas, waste areas and haul roads unless the borrow areas or waste areas are provided for by the Department, and except for permanent Seeding (with Mulch) on borrow areas and waste areas within the limitations prescribed in **Subsection 203.0**4 and **Subsection 203.07**, respectively. Where the plans show separate quantities for erosion prevention and sediment control or pollution prevention items to be used outside the rights-of-way in connection with waste areas, borrow areas or other project related construction, payment will be made for these items used and accepted to the extent of these separately listed plans quantities; but the cost of any overruns in these items, or the cost of any additional items required for erosion prevention and sediment control or pollution prevention off the rights-of-way, shall be borne by the Contractor unless prior approval in writing is received from the Engineer.

In case of failure of the Contractor to control project related erosion or the discharge of pollutants, either on or off the rights-of-way, the Engineer may withhold payment of future progress estimates until the Contractor has satisfactorily performed the necessary corrective measures. If deemed necessary, the Engineer may employ outside assistance or use his own forces to provide the needed protective measures, with all incurred direct costs plus project engineering costs being charged to the Contractor by appropriate deductions from the Contractor's monthly progress estimate.

Subsection 209.08-Revise entire subsection to the following:

209.08-Method of Measurement. Erosion prevention and sediment control devices shall be measured in accordance with the appropriate Standard Drawing or as noted below.

Temporary seeding and mulching operations will be measured in accordance with the appropriate provisions of **Subsection 801.09**.

Seeding (without Mulch) and Crown vetch mixture (without Mulch) shall be measured per unit.

The accepted quantities of Road and Drainage Excavation will be measured in C.Y. (m^3).

Sediment removal and disposal for maintaining erosion prevention and sediment control measures will be measured by the cubic yard (cubic meter).

For catch basin filter assemblies, structure maintenance including cleaning to prevent clogging is included in the price bid for the structure. Sediment removal and disposal for maintaining these assemblies is not to be measured and paid directly.

Sand bags will be measured by the square foot area of berm face.

Flocculants used for turbidity reduction will be measured and paid for by the actual weight in pounds of flocculant materials applied or, for brick or log forms of flocculant material, the brick/logs will be measured by the unit, per each. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the flocculant materials. Flocculants used as either a soil binder or tackifier for erosion control applications shall be measured by the acre.

Subsection 209-09. Revise entire subsection to the following:

209.09-Basis of Payment. All Non-Structural Best Management Practices shall be included in the bid cost of the project.

Items used to install erosion prevention and sediment control devices include basis of payment information along with measurement information on the standard drawings. The standard drawing item numbers and measurement units shall be used for measurement and payment unless otherwise specified. All measures shall be constructed and accepted according to the applicable Standard Drawings and specifications prior to measurement and payment.

Additional information regarding basis of payment for erosion prevention and sediment control measures and components is listed below.

Unless otherwise stated on the corresponding Standard Drawings, payment for erosion prevention and sediment control measures shall include all materials and labor necessary for the measure's construction, maintenance and removal.

For catch basin filter assemblies, structure maintenance including cleaning to prevent clogging is included in the price bid for the structure. Sediment removal and disposal for maintaining these assemblies is not to be measured and paid directly.

Seeding (with Mulch), Seeding (without Mulch), Temporary Seeding (with Mulch) Crown vetch mixture (without Mulch) and Mulch items will be paid for in accordance with the appropriate provisions of **Subsection 801.10**.

The accepted quantities of Road and Drainage Excavation will be paid for at the contract unit price per C.Y. (m^3).

Sediment removal and disposal for maintaining erosion prevention and sediment control measures will be paid for at the unit price per C. Y. (m^3).

For catch basin filter assemblies, structure maintenance including cleaning to prevent clogging is included in the price bid for the structure. Sediment removal and disposal for maintaining these assemblies is not to be measured and paid directly.

Rock used for inlet and outlet control on erosion prevention and sediment control measures will be paid for at the contract unit price per ton (tonne).

Pipe used in the construction of erosion prevention and sediment control measures will be paid for in accordance with the appropriate provisions of **Subsection 607.13**.

Concrete used in the construction of spillways or other structures pertaining to sediment structures will be paid for in accordance with the appropriate provisions of **Section 703**.

Water used in preparation of the seed bed and for maintenance will paid for at the contract unit price per M.G. (1,000 gal.) (m^3) of water.

Sand bags will be counted per bag and will be paid for at the contract unit price per bag.

For flocculants, the accepted quantities, determined as provided above, will be paid for at the contract unit prices, which payment shall be full compensation for all equipment, materials, labor, and incidentals necessary to complete the work.

The Sediment Filter Bags will be paid for at the contract price bid per each for the size bag used which includes installation and/or replacement along with all materials, equipment, tools, labor, and incidentals to complete the work. Payment for removal and disposal of material from bag shall be made by the C.Y. (m^3) at contract price for sediment removal.