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Section 110 - Erosion, Sediment Control and Water Pollution

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110.01 Definitions.

Clearing. The clearing of trees, brush, shrubs, downed timber, rotten wood, rubbish, and any other vegetation, except where excluded by the definition for grubbing, as well as the removal of fences and structures. See [Subsection 201.01](#).

Disturbed Area. An area where any activity has been initiated which may result in soil erosion from water or wind or movement of sediments or pollutants into state waters or onto lands in the state, or which may result in accelerated stormwater runoff, including, but not limited to, clearing, grubbing, grading, excavating, transporting, filling, and backfilling of land.

Grubbing. Shall mean the removal from the ground of trees, stumps, roots, brush, root mat, and debris.

Phasing. Staged construction sequencing as shown on the erosion and sediment control plans and the maintenance of traffic plans.

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110.02 Legal Authority. The Department is a delegated agency of the DNREC as defined in Chapter 40, Title 7 of the Delaware Code and the Delaware Sediment and Stormwater Regulations. Any

project built under the Contract documents shall maintain compliance with the aforementioned law and regulations at all times throughout the life of that project. As a delegated agency, the Department may enforce compliance with the law and regulations through the Contract documents or may refer a project to the DNREC for enforcement action.

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110.03 Sediment and Stormwater Permit Approval. A signature, date, and seal in the Stormwater Engineer's block on the title sheet of the Plans indicates that the Plans were designed in conformance with the applicable State and Federal stormwater regulations and that the Sediment and Stormwater Permit is approved. All work shall be completed pursuant to the Plans.

Review and approval of the erosion, sediment control, and water pollution control plan or errors and omissions in the Plans shall not relieve the Contractor from its responsibilities for compliance with the Delaware Sediment and Stormwater Regulations or other applicable laws or regulations and the more stringent water pollution control requirements shall apply.

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110.04 Description of Work. Erosion and sediment control measures shall be applied to erodible earth material exposed by any of the Contractor's land disturbing activities on the Project. The work shall consist of the application of temporary and permanent erosion and sediment control items as provided in the Contract or ordered by the Engineer. The temporary erosion control items shall be coordinated with the permanent erosion control items specified. The items shall include, but are not limited to, the use of berms, dikes, dams, sediment basins, traps, geotextiles, stone check dams, silt fences, phased construction, special land grading methods, mats and nets, aggregates, mulches, grasses, slope drains, chemical binders, tackifiers, and other erosion and sediment control items or approved methods as designated in the Contract documents or as directed by the Engineer.

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110.05 Completion of the Work. This Subsection sets forth the methods of construction operations, progress schedules, and construction phasing, staging, and sequencing for the completion of temporary or permanent erosion and sediment control work.

The Contractor shall implement the temporary and permanent erosion control items for each phase of construction as detailed in the Contract documents. Additional erosion and sediment control items may be required from time to time during the life of the Project as deemed necessary by the Engineer in order to provide continuous erosion and sediment control protection.

Before starting each phase of any land-disturbing activity, the Contractor shall make certain that all erosion and sediment control

items required in that phase are installed and functional.

- A. **Construction Phasing.** For Project sites in excess of 20 ac (8 ha), the construction must be phased in 20 ac (8 ha) increments. Once grading is initiated in one 20 ac (8 ha) increment, a second 20 ac (8 ha) increment may be cleared and grubbed provided the Contractor installs and maintains effective erosion and sediment control measures on both sections in such quantities and locations as deemed acceptable by the Engineer.

When balancing earthwork, such as when borrow from a cut is used as fill at a noncontiguous location distant from the cut, more than a total of 20 ac (8 ha) may be allowed to be grubbed and graded within the overall limits of the Project at any one time with prior written approval from the Engineer. In such cases, one 20 ac (8 ha) increment in cut and one 20 ac (8 ha) increment in fill may be grubbed and graded at each separate location concurrently. Examples of when this would likely occur would be on interchange construction or on a new alignment.

The Engineer may further limit the area of clearing, grubbing, stripping, and grading operations to the Contractor's capability and actual progress of keeping the finish grading, mulching, seeding, and other temporary or permanent erosion control measures current according to the approved progress schedule and construction sequence.

- B. **Construction Sequence.** The Contractor shall sequence the construction to comply with the following constraints unless indicated otherwise on the Plans:
1. Implement temporary erosion and sediment control items prior to any operation which exposes soil to erosion, such as during the clearing portion and prior to the grubbing portion of each phase of construction.
 2. Schedule and perform the clearing and grubbing operations so that grading operations and permanent stabilization can follow immediately thereafter. Once earthwork has begun, the operation shall be continuous from clearing and grubbing through to completion of grading and final stabilization in accordance with [Subsection 110.09](#) A.2. Any interruption in these operations in excess of 14 calendar days must be approved by the Engineer and shall require interim stabilization in accordance with [Subsection 110.09](#) A.1.
 3. Vegetatively stabilize bare soil areas in each phase of construction in accordance

with Subsection 110.09 A.1. prior to advancing the work into the next phase of construction.

4. Vegetatively stabilize all cut and fill slopes of the highway excavation and embankment as the work progresses in height increments not to exceed 10N (3 m) measured along the slope surface.
5. Excavate roadside ditches as early in the Project as possible to establish good drainage.
6. Vegetatively stabilize all grass ditches, swales, and medians within seven calendar days after their initial excavation.
7. Remove temporary erosion and sediment controls after final stabilization is complete in accordance with [Subsection 110.09 A.2.](#) Return land contours to original grade or as indicated on the Plans, and vegetatively stabilize any remaining bare soil areas.

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110.06 Plan Changes. The Contractor shall not deviate from the Plans without prior review and approval by the Engineer and appropriate regulatory authorities. Those portions of the Plans which are normally covered by environmental permits include, but are not limited to, erosion and sediment control, stormwater management, construction sequencing, stream diversions, and site dewatering.

For plan changes initiated by the Contractor, revised construction Plans shall be submitted for review and approval by the Engineer. The revised Plans shall be prepared in accordance with current Department standards for roadway design, traffic control, erosion and sediment control, and stormwater management. Revised Plans shall also conform to all applicable Federal, State, or municipal pollution control laws, rules, or regulations. All supporting design calculations and cost analyses required by the Engineer shall accompany the submission. The number of copies required to be submitted for review shall be determined by the Engineer depending on the nature of the proposed revision.

Contractor proposed revisions to the Plans, as well as review time by the Department, will not justify a delay in the progress schedule. All costs involved in preparing plan revision documents for changes proposed by the Contractor shall be the responsibility of the Contractor.

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110.07 Limits of Construction. The Contractor shall not perform any work including, but not limited to, clearing, grubbing,

construction phasing, equipment storage, and material stockpiling outside the limits of construction shown on the Plans without prior approval of the Engineer.

If the Contractor should require additional lands which are not within Department rights-of-way or easements, it shall be the Contractor's responsibility to make all arrangements with the property owners and to acquire all permits from the appropriate regulatory authorities for the use of these lands.

The Contractor shall acquire a statement signed by the property owners which releases the Department from all claims arising from the use of the property being considered. The signed statement from the property owner and copies of all permits acquired by the Contractor shall be transmitted by the Contractor to the Engineer for the Engineer's records prior to initiating any operation on the property being considered for use.

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110.08 Site Reviewer. A Site Reviewer shall be a person from the Contractor's staff assigned to erosion and sediment control implementation and maintenance and shall be required on specific projects as noted in the Plans. The name and DNREC certification number of each Site Reviewer so required shall be submitted to the Department at the time of bid.

110.09 Vegetative Stabilization.

- A. **Interim and Final Stabilization.** An area of the work shall be considered vegetatively stabilized for erosion control if it meets the criteria in one of the following two cases:
 - 1. **Interim Stabilization.** The seeding and mulching items, sod, or erosion and sediment control items as noted on the Plans are in place and accepted by the Engineer.
 - 2. **Final Stabilization.** Meets the requirement for the removal of the temporary erosion controls placed during interim stabilization and complete growth of vegetation has occurred to the satisfaction of the Engineer. Complete growth of vegetation includes permanent grass reaching a height of 30 (75 mm) over all areas seeded.
- B. **Incremental Stabilization.** Side slopes, and other slopes 1:3 (vertical to horizontal) or steeper require placement of either temporary or permanent seeding and mulching as the work progresses in height increments not to exceed 10N (3 m) measured along the slope surface.

Tracking of Slopes. During grading operations the Contractor shall track all slopes 1:3 (vertical to horizontal) or steeper to prevent gully and sheet erosion. The tracking shall be accomplished by driving

cleated equipment such as a bulldozer up and down the slopes so the cleats make horizontally oriented indentations in the soil. All costs associated with tracking of slopes at regular increments shall be incidental to [Section 202](#).

Prior to applying seeding items on slopes 1:3 (vertical to horizontal) or steeper, the Contractor shall track the slopes as described above in order to prepare a stable seedbed. All costs associated with tracking of slopes to prepare a seedbed shall be incidental to the seeding item being applied to the slope surface.

- D. **Maximum Soil Exposure Times.** All erodible earth material exposed by the Contractor's activities shall be vegetatively stabilized within the time frames specified below:

Location	Maximum Time to Vegetatively Stabilize
Sediment controls (berms, ditches, traps, basins, etc.)	Seven calendar days from initial construction
Areas meeting final grades	Seven calendar days from completion of grading
Areas not meeting final grades	Fourteen calendar days from ceasing work in that location

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110.10 Temporarily Stockpiled Material. Erodeable earth material designated on the Plans or required by the Engineer to be excavated and temporarily stockpiled for later use in the Project shall be located away from live streams and wetlands, kept within Department rights-of-way and easements, and placed only in areas deemed appropriate by the Engineer.

The Contractor shall install the erosion and sediment control items designated on the Plans or as directed by the Engineer about the base of the pile in advance of the actual stockpiling operation. Erodeable earth material shall be placed in piles of neat conformations. Side slopes shall be seeded and mulched as the pile is placed in height increments of 10N (3 m) measured along the slope surface. All remaining unstabilized surfaces shall be seeded and mulched immediately following completion of the stockpiling operation.

If the Contractor proposes to stockpile erodeable earth material in areas not designated on the Plans for such use, it shall be the Contractor's responsibility to prepare and submit for approval by the Engineer erosion and sediment control plans for those proposed areas which are located within Department rights-of-way and easements. Materials shall not be stockpiled until an erosion and sediment control plan for the proposed stockpile has been approved by the Engineer.

If the Contractor proposes to stockpile erodeable earth material in areas outside of Department rights-of-way and easements, it shall

be the Contractor's responsibility to prepare and submit for approval a plan for the use of the proposed site to the appropriate agencies having jurisdiction. No stockpiling operation shall commence in areas outside the Department rights-of-way and easements until the Engineer has received copies of all plans approved by the appropriate regulatory agencies and received copies of statements signed by the property owners, as required under [Subsection 110.07](#), which release the Department from any claims arising from the use of the property.

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110.11 Channel and Ditch Scour Protection. Riprap or other proposed channel lining items designated on the Plans at pipe, culvert, and bridge inlets and outlets and along channel lengths shall be placed before the pipes, culverts, bridges, and channels become operational.

110.12 Sediment-Laden Runoff. Stormwater runoff from disturbed areas shall be directed to an approved sediment control measure, such as a trap or basin, prior to release to ditches, storm drain systems, streams, or surface water bodies of any type. All storm drain pipes which convey sediment-laden runoff shall discharge to a sediment trap or sediment basin prior to release from the Project limits of construction as shown on the Plans, or as directed by the Engineer.

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110.13 Dewatering Operations. The Contractor shall not pump or otherwise withdraw water from below the water table at a rate exceeding 50,000 gallons (189 270 L) per day without having first obtained the necessary water allocation and well permits.

The Contractor is responsible for obtaining all permits required from the appropriate issuing authority for the withdrawal of groundwater from the Project site. Costs associated with water allocation and water well permit acquisition shall be paid by the Contractor. The Contractor shall submit copies of all permit approvals to the Engineer for the Engineer's records.

Sediment-laden dewatering discharge shall be directed to an approved sediment trapping device such as a dewatering basin, portable sediment tank, sediment trap, or sediment basin, prior to release to ditches, storm drain systems, streams, or surface water bodies of any type.

Prior to initiating a pumping operation to remove water from open excavations or temporary cofferdams, the area to be dewatered shall be allowed to rest undisturbed under quiescent conditions for a period of 12 hours in order to induce physical settling of suspended particles.

The Contractor shall attach the suction line of the pumping equipment to a flotation device, immersing the intake end no more than 60 (150 mm) below the water surface. In this manner, water

shall be "skimmed" off the surface.

Once the water level has been pumped down, further dewatering shall be accomplished in conjunction with a sump pit constructed in conformance with Department standards or as directed by the Engineer.

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110.14 Clean Water Diversions. Stormwater runoff from non-disturbed areas shall be directed away from work areas using any combination of dikes, swales, and slope drains or as shown on the Plans, or as directed by the Engineer.

110.15 Stream Diversions. The Contractor shall not conduct work in a stream without having first obtained the appropriate wetland and subaqueous lands permit(s).

When work is to be conducted in the flow line of a stream, whether the stream is perennial or intermittent, the Contractor shall use any combination of dikes, swales, ditches, cofferdams, pipes, pumps, and other devices as shown on the Plans, or as directed by the Engineer to direct the stream flow around the work area.

110.16 Temporary Stream Crossings. Equipment shall not be operated in live streams without a stream diversion being installed to the satisfaction of the Engineer. Temporary bridges or other structures shall be installed if the work requires the crossing of a stream by construction equipment.

110.17 Wash Water. Water containing sediment from any construction activity on the Project such as saw cutting, milling, aggregate washing, and equipment washing and which is not regulated as a waste water under State or Federal statutes shall be discharged to a sediment trapping device and treated by filtration or settling. Sediment-laden wash water shall not be discharged directly to any stream or waterbody of any type.

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110.18 Waste Water. Water containing pollutants such as raw sewage, bitumens, fuels, lubricants, paint, or other harmful materials, is strictly regulated under State and Federal statutes and as such shall not be discharged into waters of the State as defined in Chapter 60, Title 7 of the Delaware Code or into natural or manmade channels or storm drain systems leading to waters of the State.

The Contractor is responsible for obtaining all permits required from the appropriate issuing authority for the discharge of waste waters from the Project site. Costs associated with waste water permit acquisition shall be paid by the Contractor. The Contractor shall submit copies of all permit approvals to the Engineer for the Engineer's records.

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110.19 Water Pollution Violations Enforced If a water pollution

control violation exists on the Project which in the Engineer's judgment poses a public health or safety risk, such as a fuel or chemical spill or release of raw sewage, the Engineer may refer the violation to the DNREC for immediate enforcement action. The cost of clean up shall be the sole responsibility of the Contractor if the DNREC investigation reveals the Contractor's actions caused the violation.

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110.20 Maintenance. Erosion and sediment control items shall be maintained during the construction season as well as the winter months and other times when the Project is closed down. The Contractor shall inspect the Project site immediately after each rain and repair, replace, or maintain any erosion and sediment control item promptly as needed or as directed by the Engineer. Any eroded surface shall be stabilized, and any accumulated sediment not trapped by a control measure shall be removed and disposed of in an approved stockpile area or hauled off-site. Access shall be maintained to all sediment control devices until construction phasing and stabilization allow the removal of those controls that are no longer required.

Costs associated with repairing, replacing, and maintaining the erosion and sediment control items are incidental to the initial construction of each item. Sediment removal will be paid for separately under [Section 250](#).

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110.21 Erosion and Sediment Control Reports. The Department will provide the Contractor with erosion and sediment control reports on a regular basis. The reports will itemize work required to maintain compliance with the Contract. The Contractor shall complete the items of work listed by the completion dates indicated on the reports.

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110.22 Failure to Implement and Maintain Erosion and Sediment Control Measures. Controlling erosion and sedimentation is the Contractor's responsibility under the Contract. If the Contractor fails at any time to implement and maintain the required erosion and sediment control provisions of the Contract, the Engineer will notify the Contractor, orally or in writing, to comply with the required erosion and sediment control provisions. If the Contractor fails to perform the work as directed by the Engineer, the Engineer may take the following actions in the order listed below to gain compliance with the Contract.

- A. Stop Work Order. If the Contractor continues to fail to implement and maintain the erosion and sediment controls after oral or written direction to do so by the Engineer, or continues not to follow the approved construction phasing, sequencing, and progress schedule, the Engineer may order a "Shut-Down" of all land-disturbing activities except those necessary to bring the site into compliance with the

Contract. The Engineer will establish a time frame for completion of the erosion and sediment control work.

If the unsatisfactory construction procedures and operations are not corrected promptly after the initial "Shut-Down", the Engineer may suspend the performance of other construction until all items of work on the erosion and sediment control reports are complete and accepted.

No claims for additional time or money shall be considered due to "Shut-Downs" resulting from the Contractor's failure to implement and maintain the required erosion and sediment control items or failure to follow the approved construction phasing, staging, sequencing, and progress schedule required by the Contract documents.

- B. Withhold Progress Payment. If the Contractor fails to bring the erosion and sediment controls into compliance with the Contract documents or fails to proceed in accordance with the approved construction phasing, staging, and sequencing after oral or written direction from the Engineer to do so and after a "Shut-Down" of all land-disturbing activities, then no monthly estimate or payment will be made. No payment will be made until all items of work on the erosion and sediment control reports are complete and accepted.
- C. Deduct Cost of Work Completed By Others. If the Contractor fails to remedy unsatisfactory conditions within the time frame established and after all land-disturbing activities have been shut down and payment has been withheld, then the Engineer may proceed with adequate forces and equipment to implement or maintain the erosion and sediment control items necessary to bring the Project into compliance with the Contract documents. The entire cost of this work for engaging an on-call contractor and administering the on-call contractor will be deducted from monies due the Contractor on the Contract.
- D. Default of Contract. More than one "Shut-Down" for erosion and sediment control noncompliance may be considered as a failure to perform the terms of the Contract and will be grounds for finding the Contractor in default of the Contract in accordance with Subsection 108.10. If the Contractor defaults on the erosion and sediment control provisions of the Contract, the Project will be referred to the DNREC for enforcement action.

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110.23 Contractor Payment. Payment will be made at the unit prices bid for the quantities of the various erosion and sediment control items provided in the Contract which are installed by the Contractor and accepted by the Engineer. Any additional work or corrections brought about by errors by the Contractor such as nonconformance with the Contract documents and the construction phasing, staging, or sequencing will be made at the Contractor's

expense.

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