

VIRGINIA DEPARTMENT OF TRANSPORTATION

LOCATION AND DESIGN DIVISION

INSTRUCTIONAL AND INFORMATIONAL MEMORANDUM

GENERAL SUBJECT: STORMWATER MANAGEMENT EROSION AND SEDIMENT CONTROL PROGRAM	NUMBER: IIM-LD-11.28
SPECIFIC SUBJECT: PROGRAM ADMINISTRATION AND MINIMUM REQUIREMENTS FOR THE DEVELOPMENT AND IMPLEMENTATION OF EROSION AND SEDIMENT CONTROL AND POST CONSTRUCTION STORMWATER MANAGEMENT PLANS	DATE: Draft 12/4/2012
	SUPERSEDES: IIM-LD-11.27
DIVISION ADMINISTRATOR APPROVAL:	

Changes are shaded.

CURRENT REVISION

- This memorandum has been revised in accordance with recommendations from the Virginia Department of Conservation and Recreation's annual review. On sheet 7, paragraph 4.2, the reference to a "Tributary Strategy Plan" has been deleted. On sheet 9, paragraph 5.1, "steep slopes" has been added; "silt traps" have been deleted.

EFFECTIVE DATE

- This memorandum is effective upon receipt.

BACKGROUND

- Program administration details and instructions on the development of erosion and sediment control plans for Standard, Minimum, No Plan, SAAP, Capital Outlay and State Force Construction/Maintenance Projects are contained in this IIM.

- Instructions pertaining to the design criteria and procedures for incorporating erosion and sediment control features into an erosion and sediment control plan and an example of an erosion and sediment control plan for a “No Plan” project are contained in Appendix 10B-1 and 10C-1 in Chapter 10 of the latest version of the VDOT Drainage Manual.

ACRONYMS

- The following acronyms are used within this document:
 - ACE – Area Construction Engineer
 - CA – Contract Administrator
 - CEP – Concurrent Engineering Process
 - DCR – Department of Conservation and Recreation
 - EPA – Environmental Protection Agency
 - ESC – Erosion and Sediment Control
 - ESCCC – Erosion and Sediment Control Contractor Certification
 - FI – Field Inspection
 - HDA – Hydraulic Design Advisory
 - IIM – Informational and Instructional Memorandum
 - PFI – Preliminary Field Inspection
 - PM – Project Manager
 - RA – Residency Administrator
 - R&B – Road and Bridge
 - RLD – Responsible Land Disturber
 - RLDA – Regulated Land Disturbance Activity
 - SLS – Straight Line Sketch
 - SWM – Stormwater Management
 - SWPPP – Stormwater Pollution Prevention Plan
 - TMDL – Total Maximum Daily Load
 - VDOT – Virginia Department of Transportation
 - VSMP – Virginia Stormwater Management Program
 - VTCA – Virginia Transportation Construction Alliance

1.0 PROGRAM ADMINISTRATION

- 1.1 VDOT receives an annual approval of its ESC Standards and Specifications from DCR. By its annual approval of VDOT’s ESC Standards and Specifications, DCR authorizes VDOT to administer its ESC Program in accordance with the Approved ESC Standards and Specifications, on all regulated land disturbance activities undertaken by the Department.

- 1.2 VDOT's Approved ESC Standards and Specifications shall apply to all plan design, construction and maintenance activities undertaken by VDOT, either by its internal workforce or contracted to external entities, where such activities are regulated by the Virginia ESC Law and Regulations. During any inspections of VDOT land disturbing activities by DCR, EPA and other such environmental agencies, compliance with the VDOT's Approved ESC Standards and Specifications (and all parts thereof) will be expected. A standard, specification or product not contained or referenced in VDOT's Approved ESC Standards and Specifications can not be used unless it is submitted to and approved by DCR either as a revision to the Approved ESC Standards and Specifications or a project specific variance.
- 1.3 Statewide use of standards, specifications or products not contained in VDOT's DCR Approved ESC Standards and Specifications will require a revision to the Approved ESC Standards and Specifications. Any revisions to the Approved ESC Standards and Specifications shall be reviewed and approved by DCR prior to implementation by VDOT. Such review and approval shall be coordinated by the VDOT State Stormwater Program Administrator in the VDOT Central Office with the DCR Regulatory Programs Manager in the DCR Central Office Stormwater Management Division.
- 1.4 Where determined necessary to meet an individual project need, VDOT may request DCR to grant a project specific variance to the Approved ESC Standards and Specifications.
 - 1.4.1 All requests for project specific variances for those projects being designed in a VDOT District Office shall be coordinated by the District Hydraulics Engineer with the appropriate DCR Regional Office staff. All variance requests shall be accompanied by complete details and documentation, including justification for the requested variance. Copies of any variance requests, approvals and related correspondence are to be sent to the DCR Regulatory Programs Manager in the DCR Central Office Stormwater Management Division and the VDOT State Stormwater Program Administrator in the VDOT Central Office. If the VDOT District Office and the DCR Regional Office can not come to agreement on a specific request, or if additional review is necessary, the assistance of the DCR or VDOT Central Office can be requested.
 - 1.4.2 All requests for project specific variances for those projects being designed in the VDOT Central Office shall be coordinated by the VDOT State Hydraulics Engineer with the DCR Regulatory Programs Manager. All variance requests shall be accompanied by complete details and documentation, including justification for the requested variance. Copies of any variance requests, approvals and related correspondence are to be sent to the VDOT State Stormwater Program Administrator.
 - 1.4.3 All requested variances are to be considered unapproved until written approval from DCR is received.
 - 1.4.4 All approved variances shall be listed in Note 1 in Section II of the SWPPP General Information Sheets in the construction plans (or other such documents) for the land disturbing activity (see latest version of IIM-LD-246).

- 1.4.5 All documentation for and approval of requested variances shall be retained in the appropriate (i.e. design, construction, etc.) files of the proposed activity.
 - 1.4.6 The VDOT State Stormwater Programs Administrator shall maintain a file of all requested and approved variances.
 - 1.5 Non linear projects, such as those administered by the VDOT's Capital Outlay Program, are encouraged to utilize VDOT's Approved ESC Standards and Specifications in the development of the ESC Plan for such projects. Where deemed impractical to use VDOT's Approved ESC Standards and Specifications and when approved by the VDOT State Stormwater Program Administrator, DCR's ESC Standards and Specifications, as outlined in the Virginia Erosion and Sediment Control Regulations and Handbook, may be utilized in combination with VDOT's Approved ESC Standards and Specifications to develop ESC Plans for non linear projects. Such projects include, but are not limited to, new and/or additions/modifications to Rest Areas, District or Residency Office complexes, Area Maintenance Headquarters/Repair Shops and buildings on the right of way or associated with bridges/piers/tunnels, spreader/tailgate/wash rack sites, holding ponds or containment pads, fuel dispensing facilities, security facilities and drainage improvements to building/parking sites and structures.
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2.0 DCR CERTIFICATIONS

- 2.1 The Virginia ESC Law and Regulations require that the ESC Program administration and the ESC Plan design, implementation and inspection activities be conducted by DCR certified personnel for all Regulated Land Disturbance Activities.
- 2.2 VDOT's ESC Program will be administrated by a DCR Certified Program Administrator.
 - 2.2.1 The Program Administrator shall be the person within the Department who has been designated to have overall responsibility for administration of VDOT's ESC Program.
 - 2.2.2 The DCR Program Administrator Certification is acquired by satisfying the DCR eligibility/training requirements and passing the DCR Program Administrator Exam or by possessing a DCR Combined Administrator Certification.
 - 2.2.3 The State Stormwater Program Administrator in the Central Office Location and Design Division is currently designated as VDOT's ESC Program Administrator.
- 2.3 The Virginia ESC Regulations require that each RLDA be overseen by a DCR certified RLD.
 - 2.3.1 The DCR RLD Certification is required for the VDOT person who has general oversight of the construction phase of a specific RLDA.

- 2.3.2 The RLD for a specific RLDA must be identified prior to beginning any land disturbance activity (see note 5 in Section I of the SWPPP General Information Sheets referenced in the latest version of IIM-LD-246).
- 2.3.3 The DCR RLD Certification is acquired by passing the DCR RLD Exam or by possessing a DCR Combined Administrator, Program Administrator, Plan Reviewer or Inspector Certification or by possessing a Professional Engineer, Land Surveyor, Landscape Architect or Architect License pursuant to Chapter 4, Title 54.1, of the Code of Virginia.
- 2.4 The proposed ESC Plan for each RLDA must be reviewed and approved by a DCR Certified ESC Plan Reviewer to ensure that the ESC Plan has been developed in accordance with VDOT's Approved ESC Standards and Specifications or variances authorized thereto.
 - 2.4.1 The DCR Plan Reviewer Certification is required for any person that has responsibility for reviewing and approving the proposed erosion and sediment control plan for a specific RLDA.
 - 2.4.2 The Certified Plan Reviewer shall be a VDOT employee, or an employee of an engineering consulting firm under contract to VDOT, who has expertise in drainage design and erosion and sediment control design.
 - 2.4.3 The DCR Plan Reviewer Certification is acquired by satisfying the DCR eligibility/training requirements and passing the DCR Plan Reviewer Exam or by possessing a DCR Combined Administrator Certification or by possessing a Professional Engineer, Land Surveyor, Landscape Architect or Architect License pursuant to Chapter 4, Title 54.1, of the Code of Virginia.
- 2.5 A DCR ESC Inspector Certification is required for those persons having responsibility for ensuring the proper implementation of, or compliance with, the proposed ESC Plan and VDOT's Approved ESC Standards and Specifications, or variances authorized thereto, throughout the construction phase of the RLDA. The ESC Law and Regulations also require that inspections of ESC facilities be conducted by a DCR certified ESC Inspector.
 - 2.5.1 The Certified Inspector shall be a VDOT employee or an employee of an engineering consulting firm under contract to VDOT and who is so identified on the SWPPP Certification form LD-445E (see latest version of IIM-LD-246).
 - 2.5.2 The DCR Inspector Certification is acquired by satisfying the DCR eligibility/training requirements and passing the DCR Inspector Certification Exam or by possessing a DCR Combined Administrator Certification.
- 2.6 It shall be the responsibility of the Project Authority to ensure that those staff with the appropriate DCR Certifications (RLD, Plan Reviewer or Inspector) perform the functions required by the ESC Law and Regulations and noted in Sections 2.3 through 2.5 of this document.

- 2.6.1 For the purposes of this document, the Project Authority is defined as that person with overall responsibility of a land disturbing activity or a specific phase of a land disturbing activity.
- 2.6.2 The Project Authority for preconstruction (design) activities is typically the PM, Residency CA, RA or other such person responsible for the preconstruction phase of the land disturbing activity. This person shall ensure that the proposed ESC Plan has been reviewed and approved by a DCR Certified Plan Reviewer.
- 2.6.3 The Project Authority for actual land disturbance (construction) activities is typically the ACE, RA or other such person responsible for the construction phase of the land disturbing activity. This person shall ensure that the RLDA has an assigned DCR Certified RLD and that the implementation of the ESC Plan, including inspection requirements, is being overseen/conducted by a DCR Certified Inspector.

3.0 VDOT TRAINING/CERTIFICATIONS

- 3.1 Where land disturbing activities occurring within VDOT right of way are regulated under the Virginia ESC Law and Regulations, Section 107.16(a) of the 2007 VDOT R&B Specifications requires that all contractors performing such land disturbing activities have a person certified by the VDOT in erosion and sediment control within the project limits. This certification requirement is mandatory for all contractors performing land disturbing activities under contracts managed by VDOT, including PPTA and Design Build agreements. For contractors performing land disturbing activities on VDOT right of way under a Land Use Permit, the certification requirements of Section 107.16(a) shall apply if the area of land disturbance within the VDOT right of way exceeds that noted in Sections 4.3 and 4.4 of this document.

EXCEPTION – Those contractors performing maintenance related land disturbing activities under a hired equipment contract whose work is directly supervised by VDOT personnel.

- 3.1.1 Successful completion of the Department’s “Erosion and Sediment Control Contractor Certification” course satisfies the certification requirements of Section 107.16 (a) of the 2007 VDOT R&B Specifications.
 - 3.1.2 The ESCCC is a joint training effort between the VDOT and the VTCA. The VDOT develops the course material and the VTCA administers the training, testing and issuance of certifications.
- 3.2 The VDOT “In Stream Maintenance Training” course is required training for all VDOT personnel performing or supervising maintenance activities, where such activities are regulated under the Virginia ESC Law and Regulations.

- 3.2.1 The “In Stream Maintenance Training” course is developed and administered by the VDOT’s Central Office Environmental Division.
- 3.2.2 The “In Stream Maintenance Training” course consists of several modules that are targeted toward best management practices for working in and around streams and other environmentally sensitive areas and controlling erosion and sedimentation associated with land disturbance on maintenance activities.
- 3.2.3 The “In Stream Maintenance Training” course is designed to be conducted at the local level (i.e., Residency, Area Maintenance Headquarters, etc.) by the Residency Environmental Specialist or other such person. The modules can be taught individually in short group meetings or several modules can be combined and taught at a more formal training session. A web based training option is available in the VDOT University Virtual Campus.

4.0 POLICY/GENERAL GUIDELINES

- 4.1 Requirements of the Virginia ESC Regulations and the VDOT ESC Standards and Specifications, as approved by the DCR and described herein, shall be incorporated into all erosion and sediment control designs and shall be enforced on all Regulated Land Disturbance Activities managed by VDOT.
- 4.2 When requested by DCR, and where deemed practical by VDOT, projects located in jurisdictions with more stringent ESC technical criteria than that contained in the Virginia ESC Law and Regulations shall be designed to meet the more stringent criteria. The local criteria may be part of a locally adopted State approved program or may be part of a watershed initiative related to the protection of a water supply, a TMDL implementation plan. It will be the responsibility of the ESC Plan Designer to demonstrate, through appropriate analysis and documentation, that the local requirements are not practical for the project under consideration. Early coordination should occur between the ESC Plan Designer and the local ESC program authority in order to identify any such requirements.
- 4.3 Any maintenance or construction activity disturbing 2,500 square feet (232 m²) or greater within the area of Tidewater, Virginia, as defined in the Virginia Chesapeake Bay Preservation Act, must have a project specific ESC Plan developed and implemented in accordance with the VDOT’s Approved ESC Standards and Specifications. Tidewater, Virginia is defined as the Counties of Accomack, Arlington, Caroline, Charles City, Chesterfield, Essex, Fairfax, Gloucester, Hanover, Henrico, Isle of Wight, James City, King George, King and Queen, King William, Lancaster, Matthews, Middlesex, New Kent, Northampton, Northumberland, Prince George, Prince William, Richmond, Spotsylvania, Stafford, Surry, Westmoreland and York and the Cities of Alexandria, Chesapeake, Colonial Heights, Fairfax, Falls

Church, Fredericksburg, Hampton, Hopewell, Newport News, Norfolk, Petersburg, Poquoson, Portsmouth, Richmond, Suffolk, Virginia Beach and Williamsburg.

- 4.4 Any maintenance or construction activity disturbing 10,000 square feet (929 m²) or greater in areas other than those within Tidewater, Virginia (as defined in Section 4.3 of this document) must have a project specific ESC Plan developed and implemented in accordance with VDOT's Approved ESC Standards and Specifications.
- 4.5 The Virginia ESC Law defines land disturbance as any land change which may result in soil erosion from water or wind and the movement of sediments into state waters or onto lands of the Commonwealth, including, but not limited to, clearing, grading, excavating, transporting and filling of land.
- 4.6 The blading/dragging/grading associated with the maintenance of the travel surface of an unpaved roadway is considered a land disturbance.
- 4.7 VDOT shall be responsible for ensuring compliance with its approved ESC Standards and Specifications by private entities (i.e., agents, contractors, subcontractors, consultants) conducting regulated land disturbance activities on projects managed by VDOT, including those constructed under the Public/Private Transportation Act (PPTA), the Design/Build process and the Capital Outlay Program.
- 4.8 When not included in the proposed ESC Plan for the RLDA, the contractor must provide an ESC Plan in accordance with Section 106 of the 2007 VDOT R&B Specifications for borrow pit sites and disposal area sites utilized exclusively to obtain or dispose of project materials. Any such ESC Plan provided by the contractor must comply with VDOT's Approved ESC Standards and Specifications. Where required, the contractor must design, construct and maintain sediment traps and/or basins at these sites. The contractor shall supply supporting calculations for sediment trap and/or basin design and calculations demonstrating compliance with the Virginia ESC Regulation MS-19 for an adequate receiving channel. All information provided by the contractor should be reviewed by the District Hydraulics Engineer or other appropriate VDOT personnel to ensure accuracy, the use of appropriate methodology and compliance with VDOT's Approved ESC Standards and Specifications, Virginia ESC Law and Regulations, and VSMP Construction Permit Conditions (where applicable).

5.0 MINIMUM REQUIREMENTS FOR ALL EROSION AND SEDIMENT CONTROL PLANS

- 5.1 The ESC Plan shall include a plan view depicting (using appropriate plan symbols and notes) locations where specific measures are needed in order to control erosion

and sediment deposition within the RLDA limits. Specific erosion and sediment control measures include, but are not limited to, protective linings for ditches and steep slopes, pipe outlet protection, filter barrier, silt fence, check dams, sediment traps, sediment basins, diversion berms and ditches, etc. The ESC Plan should be based on the existing field conditions at the time of design, the anticipated sequence of construction, and the site conditions expected as the RLDA is brought to final grade.

5.2 Erosion and Sediment Control Plan Information:

General information related to the ESC Plan is to be documented utilizing the notes in Section I, II and III of the SWPPP General Information Sheets (see the latest version of IIM-LD-246). Information required to complete the SWPPP notes will be developed by the ESC Plan Designer with assistance from District Hydraulics or Residency staff as needed.

5.3 Sequence of Construction

The proposed ESC Plan shall be developed in conjunction with the proposed Sequence of Construction Plan and should denote the required erosion and sediment controls for the intended sequence of major construction activities. In planning the sequence of construction, consideration should be given to elimination or minimization of the need for major erosion and sediment control facilities, such as sediment basins, by strategic planning of the construction timing and location of erosion and sediment control measures, grading operations, temporary and permanent channels and drainage facilities. Any changes to the proposed sequence of construction plan that could potentially cause a significant change to the proposed ESC or related Drainage Plan shall be submitted to the ESC Plan Designer/Hydraulics Engineer for evaluation of impacts.

5.4 Contents of ESC Plan

Details of the RLDA'S ESC Plan may be shown on, but is not limited to, the plan, profile, typical section and detail sheets of the construction plan set or other such documents. The ESC Plan shall, at a minimum, contain the following information:

- 5.4.1 Section I, II and III notes of the SWPPP General Information Sheets (see latest version of IIM-LD-246).
- 5.4.2 Limits of clearing and grading (plan view and typical section).
- 5.4.3 Location of temporary and permanent erosion and sediment control and related permanent stormwater management features (plan view).
- 5.4.4 Construction details for any temporary or permanent erosion and sediment control or related permanent stormwater management features if different from the VDOT R&B Standards and Specifications.

5.4.5 Location of any surface waters, wetland features, or other environmentally sensitive/critical areas within or immediately adjacent to the RLDA area. (Such features located within close proximity of the project, yet outside the limits of the construction plans or other such documents, shall be described in Note 6 in Section I of the SWPPP General Information Sheets (see latest version of IIM-LD-246).

5.4.6 Appropriate existing and proposed topographic features.

6.0 PLAN DEVELOPMENT PROCESS

6.1 Concurrent Engineering Process for Plan Development

The CEP for plan development incorporates the principles of teamwork, flexibility, and milestones. The development, review, and approval of the project specific erosion and sediment control plan is included in the CEP milestones as follows:

6.1.1 Scoping Stage

The ESC Plan Designer/Hydraulics Engineer shall identify any local ESC or related SWM technical criteria or watershed initiatives that may influence the ESC or related post construction SWM design of the project. This should include early coordination with the local ESC/SWM program authority to assess any potential impacts on the project design.

6.1.2 PFI/Public Hearing Stage

The ESC Plan Designer/Hydraulics Engineer shall develop preliminary ESC and associated post construction SWM Plans (see the latest version of IIM-LD-195 for information on the technical criteria and requirements for permanent SWM facilities) and show locations of all major erosion and sediment control, permanent stormwater management, and/or drainage facilities on the plans that may affect the required right of way. Members of the project team shall provide comments, as appropriate, to the ESC Plan Designer/Hydraulics Engineer regarding the preliminary plan, including any pertinent information that might affect the final design of the ESC or post construction SWM Plan.

6.1.3 FI Stage

Prior to the FI, the ESC Plan Designer/Hydraulics Engineer shall develop final ESC and associated post construction SWM plans and show final design locations, sizes, and other plan details as necessary to accurately determine the right-of-way and/or easement requirements, and to determine whether the selected ESC Plan Concept (see Section 6.5 of this document) is appropriate. The ESC and related post construction SWM Plan design shall address any comments or recommendations from the Public Hearing process as accepted/incorporated by the Project Manager (or other such project

authority). This phase of the ESC and related post construction SWM Plan design process provides all the necessary information needed to conduct a thorough Field Inspection. Members of the project team shall provide comments, as appropriate, to the ESC Plan Designer/Hydraulics Engineer regarding the proposed ESC and post construction SWM Plan.

6.1.4 ESC Plan Design Completion

After FI and prior to the Right of Way stage, the ESC Plan Designer/Hydraulics Engineer shall incorporate all changes, deletions, and/or additions into the ESC and related post construction SWM Plan resulting from any FI and/or Quality Control Review comments or plan revisions. The ESC and post construction SWM Plan shall be carefully reviewed for compliance with the approved VDOT ESC and SWM Standards and Specifications and the VSMP Construction Permit (where applicable) including, but not limited to, the types of proposed measures, means of access for maintenance, and required right of way and/or easements.

6.1.5 ESC & SWM Plan Design Certification

Prior to the Pre-Advertisement Conference (or similar project meeting), the ESC Plan Designer/Hydraulics Engineer shall have the ESC and related post construction SWM Plan reviewed by a DCR Certified ESC Plan Reviewer. The ESC Plan Reviewer shall verify that the ESC and related post construction SWM Plan for the project is in compliance with the VDOT Approved ESC and SWM Standards and Specifications. Any comments by the Plan Reviewer shall be addressed with the ESC Plan Designer/Hydraulics Engineer. Once all comments have been reconciled, the ESC Plan Reviewer completes, signs and forwards the ESC & SWM Plan Design Certification Form (LD-445C) to the ESC Plan Designer/Hydraulics Engineer. The ESC Plan Designer/Hydraulics Engineer provides the completed LD-445C form to the Project Manager (or other such project authority) for use in the VSMP Construction Permit Application Process (see the latest version of IIM-LD-242), if applicable. A copy of the completed LD-445C form is to be retained with the other documentation for the proposed ESC Plan.

6.2 Plan Development Process for “No Plan” Projects and Special Advertisement and Award Process (SAAP) Projects

6.2.1 A “No Plan” project is defined as an assembly of letter size sketches and narratives depicting the project’s location, typical cross section, estimated quantities and any other specific details necessary (i.e., ESC and/or post construction SWM plans) for the construction of the project. Any “No Plan” project that disturbs 2,500 square feet (232 m²) or greater in Tidewater, Virginia or 10,000 square feet (929 m²) or greater elsewhere within the State must have a project specific ESC Plan. A project developed under the “No Plan” concept is one that generally requires little or no survey, engineering or hydraulic analysis in order to produce the necessary contract documents. Any required right of way is generally acquired through donations in lieu of the purchase/condemnation process. See Appendix A of the *VDOT Road Design Manual* for additional information on the “No Plan” concept.

6.2.2 “SAAP” Projects are defined as those advertised under the Special Avertisement and Award Process. The “No Plan” concept is generally used to produce the required contract documents. “SAAP” projects generally have one or more of the following characteristics:

- They require little or no preliminary engineering.
- They are standard maintenance repair contracts (e.g., bridge, guardrail or concrete pavement repairs).
- They are standard incidental construction and/or improvement projects of limited scope.
- The work being performed involves a singular function or specialty work (e.g., bridge painting, pavement markings or pipe installation).

Any “SAAP” project that disturbs 2,500 square feet (232 m²) or greater in Tidewater, Virginia or 10,000 square feet (929 m²) or greater elsewhere within the State must have a project specific ESC Plan.

6.2.3 During the early stages of the preparation of the contract assembly for any “SAAP” or “No Plan” Project, the Contract Administrator (CA) (or other such project authority) should conduct a Scoping Meeting to determine what is needed on the project in order to comply with the VDOT Approved ESC and SWM Standards and Specifications. This should include filling out form LD-439 to the extent possible.

The Scoping Meeting should include the CA, the District L&D Engineer and/or Hydraulics Engineer, and the appropriate District Environmental Section personnel in order to accurately determine the project requirements.

6.2.4 The CA, with the assistance of the District Hydraulics Engineer, or other appropriately qualified personnel, shall prepare a preliminary Straight Line Sketch (SLS) in accordance with the instructions on Form LD-438.

6.2.5 Upon completion of the Preliminary SLS, the CA shall coordinate with the appropriate personnel in the District Hydraulics Section and other appropriate District/Residency sections to schedule a Field Review. The following data should be made available to all Field Review participants:

- A completed form LD-439.
- A Vicinity Map – United States Geological Survey (USGS) Topographical Map and County Road Map showing the location and limits of the proposed project.
- A SLS of the project prepared in accordance with the instructions on form LD-438, showing the project limits and the approximate location of proposed drainage items and erosion and sediment control items.

- 6.2.6 If during the Field Review it is found that such items as permanent stormwater management facilities, drainage improvements, temporary sediment basins or temporary sediment traps are required, the District Hydraulics Section will determine and request the necessary survey data, and provide engineering support in the development of the SLS to ensure consistency with the VDOT Approved ESC and SWM Standards and Specifications.
- 6.2.7 Upon completion of the design of any required permanent stormwater management facilities, drainage improvements, or sediment trapping facilities, the District Hydraulics Section will provide the CA with final comments, recommendations and plan details.
- 6.2.8 Final approval of the SLS:
- Upon incorporation of all the required revisions, a DCR Certified ESC Plan Reviewer shall make a final review of the ESC and post construction SWM Plan (if applicable). Once any Plan Reviewer comments have been reconciled with the ESC Plan Designer/Hydraulics Engineer, the Plan Reviewer shall complete and sign the LD-445C Erosion and Sediment Control and Stormwater Management Certification form and forward it to the CA for use in the VSMP Construction Permit Application Process (see the latest version of IIM-LD-242), if applicable. A copy of the completed LD-445C form is to be retained with the other documentation for the proposed ESC Plan.
 - The CA will incorporate the final SLS into the contract assembly.
 - Thereafter, any significant change to the project that may impact the ESC, post construction SWM, or Drainage Plan will require resubmission of the revised SLS to the ESC Plan Designer and/or District Hydraulics Engineer for review and approval prior to implementation.
- 6.2.9 The final version of the SLS, the SWPPP General Information Sheets (See latest version of IIM-LD-246) and any Construction Notes will serve as the ESC and post construction SWM Plan for the project. During the construction phase of the project, a copy of the ESC and post construction SWM Plan (Record Set) and all other SWPPP documents shall be kept on the project site and in the project file at the appropriate District/Residency Office as documentation that all policies and procedures have been addressed with regards to the post construction SWM, ESC and SWPPP requirements of the project. During construction, any authorized changes to the proposed ESC Plan necessitated by unforeseen conditions or other circumstances shall be documented on the Record Set in accordance with Section 107.16(e) of the 2007 VDOT R&B Specifications.

6.3 Plan Development Process for State Force Construction Projects

- 6.3.1 State Force Construction Projects include land-disturbing activities that are performed with state force equipment and/or hired equipment.
 - 6.3.2 Residency personnel are to contact the Residency Environmental Specialist and/or the District Hydraulics Engineer to review any State Force Construction Projects to determine if the proposed work is of a magnitude that may require drainage improvements, an ESC Plan, a post construction SWM Plan, and/or a SWPPP. If it is determined that any of these items are needed, the same procedures outlined in Section 6.2 of this document shall be followed.
- 6.4 Plan Development Process for Minimum Plan and Standard Plan Construction Projects
- 6.4.1 Minimum Plan projects are those that require a limited amount of survey information in order to perform the necessary engineering studies and to provide the information required to secure the necessary rights of way. The minimum amounts of detail needed to address environmental requirements and to construct the project are provided in a standard plan assembly format. See Appendix A of the *VDOT Road Design Manual* for additional information on the Minimum Plan concept.
 - 6.4.2 Standard Plan Projects are those that require complete survey information in order to perform the necessary detailed engineering studies and to develop a complete and detailed construction plan assembly.
 - 6.4.3 Projects developed under the Minimum and Standard Plan concepts must have an ESC plan and a SWPPP (see the latest version of IIM-LD-246) if they exceed the land disturbance threshold amounts noted in Sections 4.3 and 4.4 of this document. In addition, such projects may also require a post construction SWM Plan (see the latest version of IIM-LD-195 for applicability and technical criteria and requirements). These plan assemblies should be developed consistent with the steps identified under the Concurrent Engineering Plan Development process described in Section 6.3 of this document.
- 6.5 The ESC Plan shall be developed utilizing either a single phase or a multiple phase concept. The decision as to which concept to use in the development of the ESC Plan for each specific RLDA shall be determined by the ESC Plan Designer/Hydraulics Engineer and the Project Manager (or other such project authority) during the initial stages of plan development.
- 6.5.1 Single Phase ESC Plan Concept
 - 6.5.1.1 The Single Phase ESC Plan concept may be used on minor construction projects where all of the erosion and sediment control measures can be clearly depicted on the construction plan sheet (e.g., rural secondary project, minor urban widening project, bridge and approach project, etc.)

6.5.1.2 The ESC Plan shall address both those items requiring installation prior to the beginning of grubbing operations or the installation of major drainage structures and those items to be installed as grading operations and installation of minor drainage facilities progress. The ESC Plan shall contain or be accompanied by, at a minimum, all those items identified in Section 5.4 of this document (Contents of an ESC Plan).

6.5.1.3 In addition to standard plan symbols, supplemental notes/narratives may be used to clearly define the intent and purpose of the proposed erosion and sediment control measures and to define their sequence of installation. Some standard construction notes and symbols have been developed and are included as a part of the VDOT CADD Cell and Custom Line Style Library and the Geopak Road Plan View Labeler.

6.5.2 Multiple Phase ESC Plan Concept

6.5.2.1 The Multiple Phase ESC Plan concept shall be used on construction projects where additional plan sheet(s) are needed in order to clearly depict the erosion and sediment control measures required at the various stages of construction (e.g., rural multi-lane roadway projects, major urban roadway projects, roadway projects on new locations, roadway projects through environmentally sensitive areas, etc.).

6.5.2.2 In addition to standard plan symbols, supplemental notes/narratives may be used to clearly define the intent and purpose of the proposed erosion and sediment control measures and to define their installation sequencing. Some standard construction notes and symbols have been developed and are included as a part of the VDOT CADD Cell and Custom Line Style Library and the Geopak Road Plan View Labeler.

6.5.2.3 Projects may be developed using the Multiple Phase concept on only those portions of the project that require greater detail and clarity than that provided by the Single Phase concept (e.g., construction in environmentally sensitive areas or major waterway areas, areas where plan clutter reduces the ability to clearly show the erosion and sediment control items, and where grading operations are required prior to installation of major temporary ESC measures or permanent drainage improvements).

6.5.2.4 At a minimum, the multiple phase ESC Plan should be developed in two phases:

- Phase I for those items that need to be installed prior to the beginning of grubbing operations or the installation of major drainage structures.

- Phase II for those items that need to be installed as grading operations and installation of minor drainage facilities progress.
- 6.5.2.5 Projects with complex grading operations and/or sequence of construction plans may warrant additional ESC Plan Phases to clearly identify all required ESC items.
- 6.5.2.6 Generally, the Phase I and the Phase II plan details (including associated narratives or notes) should each be depicted on a separate plan sheet following the applicable construction plan sheet (e.g., Construction Plan Sheet 5, Profile Sheet 5A, ESC Phase I Plan Sheet 5B, ESC Phase II Plan Sheet 5C).
- 6.5.2.7 When found appropriate, the Phase I and Phase II plan details may be depicted on a single plan sheet following the applicable construction plan sheet (e.g., Construction Plan Sheet 5, Profile Sheet 5A, ESC Phase I & II Plan Sheet 5B).
- 6.5.2.8 In general, when utilizing a separate plan sheet for the Phase I and the Phase II plan details, erosion and sediment control items (including protective linings in permanent ditches and channel relocations) depicted on the Phase I Plan Sheet should not be duplicated on the Phase II Plan Sheet. Temporary erosion and sediment control items depicted on the Phase I & II Plan Sheets should not be duplicated on the Construction Plan Sheet. Permanent drainage improvements identified for completion in Phase I, such as culverts, channels, etc, should also be shown on the Phase II plan.
- 6.5.2.9 The ESC Phase I Plan Sheet shall, at a minimum, depict the following:
- Existing contours and appropriate existing hydraulic and topographic features as referenced in the Survey File.
 - Proposed centerline, edges of pavement and construction limits.
 - Permanent drainage culverts, temporary diversion channels and permanent channel relocations (including any protective linings required) involving natural drainage ways that would be constructed or installed prior to the start of grading operations.
 - Temporary Sediment Basins (including grading contours, if applicable) that are to be constructed in the initial phases of the grading operations.
 - Permanent stormwater management basins (including grading contours, if applicable) that will be utilized as temporary sediment basins and that are to be constructed in the initial phases of the grading operations.
 - Diversion dikes, berm ditches and other perimeter ditches (including any required protective linings) that need to be installed prior to the start of grubbing or other earth moving operations.

- Temporary sediment traps, filter barriers, silt fences, rock check dams, turbidity curtains and any other perimeter controls that need to be installed prior to the start of grubbing or other earth moving operations.
- Any necessary construction notes/narratives (to include the need/location for items not typically shown on the plan view such as temporary slope drains, construction entrances, etc.).

6.5.2.10 The Phase II Plan Sheet shall, at a minimum, depict the following:

- Proposed centerline, edges of pavement and construction limits.
- Any permanent drainage culverts and channel relocations involving natural drainage ways installed under the Phase I Plan.
- Temporary sediment basins and permanent stormwater management basins installed under the Phase I Plan.
- All culverts, storm sewer pipe, drop inlets and associated drainage structures that will be installed as grading operations progress.
- All required protective ditch linings (e.g., Standard EC-2 or EC-3, concrete, riprap, etc.), paved flumes and associated structures that will be installed as grading operations progress.
- Temporary sediment traps, filter barriers, silt fences, rock check dams, drop inlet silt traps, and any other erosion and sediment control measures needed to be installed as grading operations progress.
- Any necessary construction notes/narratives (to include the need/location for items not typically shown on the plan view such as temporary slope drains, construction entrances, etc.).

6.5.2.11 The following drainage items from the Phase I and II Plan Sheets shall be depicted on the Construction Plan Sheet:

- Permanent drainage culverts, storm sewer systems, drop inlets and associated structures.
- Permanent channel relocations involving natural waterways.
- Permanent stormwater management facilities.
- Rock checkdams that will be left in place after construction to serve as a permanent stormwater management structure.

7.0 COMPUTATIONS

- 7.1 All computations to support the ESC and related post construction SWM Plan, and the drainage design plan, including the drainage area map, shall be developed in accordance with the instructions contained in the VDOT Drainage Manual, Hydraulic

Design Advisories, related Informational and Instructional Memoranda, and Drainage Design Memoranda, and shall be made part of the project file and the SWPPP for the land disturbance activity.

8.0 FIELD REVISIONS AND EVALUATIONS

- 8.1 The ESC Plan must be fully and effectively implemented throughout the entire construction phase of the project.
- 8.2 During the construction phase of the project, the Project Engineer the Project ESC Inspector, and the contractor shall continuously evaluate the project for areas that may require the deletion/addition/modification of the proposed erosion and sediment control measures/plan in order for the project to remain in compliance with the approved VDOT ESC Standards and Specifications, the Virginia ESC Law and Regulations, and the VSMP Construction Permit conditions (where applicable). Changes in the proposed ESC Plan may be needed due to unforeseen site conditions, contractor scheduling, changes in the proposed sequence of construction or other factors unknown at the time of the development of the proposed ESC Plan.
 - 8.2.1 Minor changes to the proposed ESC Plan (e.g., deletion/addition/modification to non-engineered items such as filter barrier, silt fence, check dams, inlet protection, etc.) may be approved/authorized by the VDOT DCR Certified Inspector and/or the designated RLD for the activity.
 - 8.2.2 When changes to the proposed ESC Plan require detailed hydrologic/hydraulic engineering analysis/calculations (e.g., deletion/addition/modification to engineered items such as sediment traps, sediment basins, etc.), the Project Engineer and/or the Project ESC Inspector shall coordinate a site inspection with the District Hydraulics Engineer and/or the ESC Plan Designer/Hydraulics Engineer. The site inspection should be used to assemble detailed notes, sketches, and photographs to formally document the need for ESC Plan changes. The ESC Plan Designer and/or Hydraulics Engineer will provide the appropriate engineering analysis to document the required changes and to ensure the ESC Plan's continued compliance with the approved VDOT ESC Standards and Specifications, Virginia ESC Law and Regulations, and VSMP Construction Permit conditions (where applicable).
 - 8.2.3 Any authorized changes to the proposed ESC Plan must be noted on a designated plan set (Record Set) which shall be retained on the project site and made available upon request (see Section 107.16(e) of the 2007 VDOT R&B Specifications).

8.3 During the construction phase of the project, the Project Engineer and/or the Project ESC Inspector will periodically, upon request, provide the ESC Plan Designer and/or Hydraulics Engineer with a detailed evaluation report that notes the success or failure of the proposed erosion and sediment control measures depicted in the construction plans (or other such documents) and/or the implementation of different measures as a result of new technologies/products. The VDOT Stormwater Program Administrator is to be provided a copy of all such reports.

9.0 MAINTENANCE

- 9.1 Maintenance of the erosion and sediment control items must be continually provided during the duration of the land disturbance activity.
 - 9.2 The inspection and maintenance of all temporary and permanent erosion and sediment controls shall be conducted in accordance with Sections 107.16 and 303.03 of the 2007 VDOT R&B Specifications.
 - 9.3 Accumulated sediment shall, at a minimum, be removed from erosion and sediment control facilities in accordance with Section 303.03 of the 2007 VDOT R&B Specifications.
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10.0 STANDARD FORMS

- LD-438 Guidelines for Development of Erosion and Sediment Control and Stormwater Management Plans for Projects with Straight Line Sketches
- LD-439 Drainage Information Sheet
- LD- 445C Erosion and Sediment Control and Stormwater Management Plan Certification Form

For the current version of these forms, see the VDOT extranet site at:
<http://www.extranet.vdot.state.va.us/forms/>.