Annual Standards and Specifications

for

Stormwater Management

and

Erosion and Sediment Control

Revised September 26, 2023

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INTRODUCTION

The University of Virginia (UVA) Stormwater Management (SWM) and Erosion and Sediment Control (E&SC) Program is an integral component of UVA's design, construction, maintenance, and management of the university's facilities and campuses located in Charlottesville and Wise and other non-contiguous, UVA-owned facilities such as Blandy Farm and Mountain Lake. UVA's Annual Standards and Specifications (AS&S) submittal has been developed to ensure that all land-disturbing activities undertaken by UVA will proceed in accordance with the Virginia E&SC Law and Regulations, the Virginia SWM Act and Virginia SWM Program (VSMP) Regulations as related to municipal separate storm sewer systems (MS-4) and construction activities.

All UVA construction projects are reviewed by the University Building Official's Office for code compliance. A project will not receive a building permit without documenting approval of E&SC and SWM Plans, if applicable. In addition, reference to UVA's AS&S for E&SC/SWM is included in the Facility Design Guidelines (FDG), which provides procedural and technical requirements broadly applicable to all design and construction at UVA. The FDG are available on the University's Building Official website at https://oubo.virginia.edu/hecomfdg.html and states that "All projects involving land-disturbing activity subject to Virginia Stormwater Management (SWM) and Erosion and Sediment and Control (E&SC) Laws and Regulations shall be bound by the DEQ-approved UVA Annual Standards and Specifications for SWM/E&SC."

UVA AS&S for E&SC/SWM shall apply to all plan design, construction and maintenance activities undertaken by UVA, either by its internal workforce or contracted to external entities, where such activities are regulated by the Virginia SWM/E&SC Laws. During any inspections of UVA's land-disturbing activities by DEQ, EPA and other such environmental agencies, compliance with the approved UVA AS&S for E&SC/SWM (and all parts thereof) will be expected. Land disturbing projects conducted on UVA property must follow the AS&S, regardless of funding source. Questions concerning other project scenarios and funding sources will require individual project specific review. Contact the Program Administrator for further consideration.

UVA AS&S for E&SC/SWM are submitted to the Department of Environmental Quality (DEQ) for review and approval on an annual basis. This submittal constitutes UVA's commitment to execute all provisions contained herein on our regulated land-disturbing activities and land development projects. As such, this submittal will be made available and utilized as an operational guidance document by all appropriate UVA and DEQ personnel. A link to this submittal is available on-line at https://www.fm.virginia.edu/depts/operations/environmental/erosion.html.

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APPENDICES

1.0 ANNUAL STANDARDS AND SPECIFICATIONS ADMINISTRATION

All projects involving land-disturbing activity subject to Virginia SWM/E&SC Laws and Regulations shall be bound by the UVA AS&S for SWM/E&SC. A "land-disturbing activity" is defined as:

- any man-made change to the land surface that may result in soil erosion from water or wind and the movement of sediments into state waters or onto lands in the Commonwealth, including, but not limited to, clearing, grading, excavating, transporting, and filling of land, except that the term shall not include the activities listed in § 62.1-44.15:51 of the Code of Virginia. [Virginia E&SC Law]

- a manmade change to the land surface that potentially changes its runoff characteristics including clearing, grading, or excavation, except that the term shall not include those exemptions specified in § 62.1-44.15:34 of the Code of Virginia. [Virginia Stormwater Management Program Regulation]

1.1 UVA AS&S for SWM/E&SC approved by DEQ are composed of general specifications. The general specifications that apply to the land-disturbing activities, listed in 1.0 above, include by reference the following:

1.1.1 Stormwater Management Act (§62.1-44.15:24-50 as amended)
1.1.2 Virginia Stormwater Management Program (VSMP) Regulations (9VAC25-870 as amended)
1.1.3 General VPDES Permit for Discharges of Stormwater from Construction Activities (9VAC25-880 as amended)
1.1.4 General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (9VAC25-890 as amended)
1.1.5 Virginia Stormwater BMP Clearinghouse (https://www.swbmp.vwrrc.vt.edu/)
1.1.6 Guidance Memo No. 16-2001 Updated Virginia Runoff Reduction Method Compliance Spreadsheets - Version 3.0.
1.1.7 Erosion and Sediment Control Law (§62.1-44.15:51-66 as amended)
1.1.8 Erosion and Sediment Control Regulations (9VAC25-840 as amended)
1.1.9 Erosion and Sediment Control and Stormwater Management Certification Regulations (9VAC25-850 as amended)
1.1.10 Virginia Erosion and Sediment Control Handbook (VESCH), 1992 as amended
1.1.11 E&SC Technical Bulletins, as amended

1.2 Any land-disturbing activity carried out in a locality with SWM and/or E&SC ordinances that are more stringent than the state program shall be consistent with the requirements of the local program to the maximum extent practicable per 9VAC25-870-170.

1.3 Soil erosion control requirements and water quantity technical criteria adopted pursuant to the SWM Act shall apply to any land disturbing activity that disturbs ≥ 10,000 square feet within Albemarle County or ≥ 6,000 square feet in the City of Charlottesville. A plan addressing these requirements shall be submitted to the UVA Administrator as described in Section 3.1.

1.4 Soil erosion control requirements and water quantity and water quality technical criteria adopted pursuant to the SWM Act shall apply to any land disturbing activity that disturbs ≥ 10,000 sf within Albemarle County or ≥ 6,000 square feet in the City of Charlottesville. A plan addressing these requirements shall be submitted to the UVA Administrator as described in Section 3.1.

1.5 Site-Specific SWM plans shall also be prepared for all projects involving a regulated land-disturbing activity that requires:

1.4.1 Land-disturbing activity contained within a watershed of a regional water quality stormwater management facility

1.4.2 Incorporates the use of a stormwater best management practice (BMP)

1.6 Site-Specific SWM/E&SC Plans will follow the latest regulations and design standards and include the information requested in Section 4 and plan preparer's checklists in Appendix A.

1.7 UVA may request DEQ to grant a project-specific variance from the E&SC Minimum Standards or an exception from the SWM technical criteria as included and approved in the UVA AS&S for SWM/E&SC. All requested variances or exceptions are to be considered unapproved until written approval from DEQ is received. Refer to Section 5.0 for more information on variances and exceptions.

1.8 Any regulated land-disturbing activity that (i) disturbs one acre or more of land or (ii) disturbs less than one acre of land and is part of a larger common plan of development that results in one acre or greater of land disturbance is required to obtain Construction General Permit (CGP) permit coverage. See Section 3.3 for more details.

1.9 Prior to starting a land-disturbing project, the project must have written approval of the SWM/E&SC Plans issued by the UVA AS&S Administrator (Administrator) and received the CGP coverage letter from DEQ, if applicable.

1.10 Regulated land disturbing activities that obtain an initial CGP on or after July 1, 2014, shall be conducted in accordance with the Part II B (9VAC25-870-62 et seq.) technical criteria and shall remain subject to the Part II B technical criteria for two additional state permit cycles (9VAC25-870-47). After such time, portions of the project not under construction shall become subject to any new technical criteria adopted by the State Water Control Board. Any land-disturbing activity shall be considered

grandfathered and shall be subject to the Part IIC technical criteria provided it meets the criteria stated in 9VAC25-870-48.

1.11 Regulated land disturbing activities shall be carried out under the supervision of a Responsible Land Disturber (RLD) holding a valid certificate issued by DEQ. The RLD shall be designated prior to initiating the land-disturbing activity. UVA shall notify the DEQ Central Office and DEQ Valley or Southwest Regional Office (as applicable) of the RLD at least two weeks in advance of the land-disturbing activity. The information provided shall include the name, contact information and certification number of the RLD.

2.0 ANNUAL STANDARDS AND SPECIFICATIONS PERSONNEL

UVA Environmental Resources is the administrator of UVA's AS&S for SWM/E&SC. The following is a breakdown of related responsibilities and titles. Responsibilities may be combined in terms of staffing resources only if the person responsible for the task(s) is qualified per Section 1.1.9. The following titles are designated to ensure compliance with UVA AS&S for SWM/E&SC on all UVA projects.

2.1 SWM/E&SC AS&S Administrator (Administrator) shall have overall management and coordination responsibilities for UVA AS&S for SWM/E&SC. This person will reside within UVA Environmental Resources. At a minimum, this person shall be a DEQ-certified program administrator. All official final SWM and E&SC plan approvals will be issued by the UVA Administrator with a letter that contains the date of the approved plan.

2.2 SWM/E&SC Plan Reviewer shall be responsible for reviewing plans to ensure compliance with UVA AS&S for SWM/E&SC and applicable SWM/E&SC laws and regulations. The Plan Reviewer must state in writing the reason(s) for disapproval of a SWM/E&SC Plan and specify the modifications, terms, and conditions necessary for plan approval. This person shall be a DEQ-certified plan reviewer for ESC and/or SWM as defined in 9VAC25-850. This position will be fulfilled via UVA Environmental Resources or University Building Official (UBO) staff or by Thomas Jefferson Soil and Water Conservation District staff for projects that occur on the Charlottesville campus and the surrounding non-contiguous UVA owned facilities near Charlottesville, VA. This position will be fulfilled via UVA Environmental Resources staff, UBO staff, or by staff from the County of Wise for projects that occur at the University of Virginia's College at Wise campus. Plan reviews completed by non-UVA staff results in a recommendation for action to the Administrator.

2.3 SWM/E&SC Inspector shall have the responsibility for inspecting E&SC practices to evaluate compliance with the approved E&SC plan and associated laws, regulations, and UVA AS&S for E&SC. The inspector shall also be responsible to inspect the construction and effectiveness of permanent stormwater management controls, verify that all required documents are available on-site for view/review, including but

not limited to, land disturbance permit, permitted plans, inspections log, VSMP permit, and a stormwater pollution prevention plan (SWPPP). The inspector shall also review proposed field changes and determine if they need formal plan review approval or only red-line modification (See Section 3.6). This position shall be a DEQ-certified inspector from UVA Environmental Resources, UBO, or Facilities Management Department. If needed, local municipal inspectors or contractors may also be used.

2.4 Certifications shall be in accordance with Virginia Erosion and Sediment Control and Stormwater Management Certification Regulations.

3.0 ANNUAL STANDARDS AND SPECIFICATIONS IMPLEMENTATION

SWM/E&SC plans shall comply with UVA AS&S for SWM/E&SC and the requirements listed in Section 1.1.

3.1 Submittals

SWM/E&SC drawings and narratives (e.g., SWM/E&SC plans) shall be submitted to UVA's Administrator for review and approval prior to initiating land-disturbing activities. The submittal should meet the requirements outlined in Section 4.0. The Administrator will transmit the SWM/E&SC plans to the appropriate plan reviewer. For the Wise campus, E&SC Plans may be transmitted directly from the project staff to the plan reviewer. The plan reviewer shall have 30 days to review the plan and provide written comments to UVA's Administrator. Prior to commencement of a land-disturbing project, the project must have received written approval for the plan(s) from UVA's Administrator.

3.2 Plan Reviews

Plan reviews shall be conducted by a DEQ-Certified Plan Reviewer. Plan reviews shall ensure compliance with the UVA AS&S and applicable SWM/E&SC laws and regulations.

3.3 Construction General Permit

3.3.1 Registration - UVA or its general contractors shall register for coverage under a CGP. A complete submittal should be sent directly to DEQ and includes:

- A completed registration statement in accordance with 9VAC25-880-50 (original, signed copy);
- A site map showing the location of the existing or proposed land-disturbing activities, the limits of land disturbance, construction entrances and all water bodies receiving stormwater discharges from the site;
- A copy of the letter from the UVA Administrator indicating that the E&SC and SWM Plan has been prepared, reviewed and approved in accordance with the DEQ-approved AS&S; and

- A completed Annual Standards & Specification Entity Information form (see Appendix B).

Links to the registration statement are available on the DEQ website at https://www.deq.virginia.gov/permits-regulations/permits/water/stormwater-construction . Do not submit a permit fee with the registration statement; DEQ will bill the applicant once the registration is processed. When completing the registration statement, note the following:

- Projects on UVA property are typically classified as State projects, institutional in nature (items IV.C and D);
- Most stormwater discharges will go to UVA's MS4, not the City's or County's (item IV.E); and
- Stormwater at UVA typically drains to Meadow Creek, HUC = JR14, or Moores Creek, HUC = JR15, (item IV.G).
- By signing the registration statement, the operator indicates that a SWPPP has been prepared for the site in accordance with 9VAC25-870-54.

3.3.2 Changes – Notify DEQ of any changes that affect information on the registration statement, permit fee form and/or permit coverage. Examples include the size of the land disturbance or contact information for the permit holder. In addition, if the CGP is transferred to another entity, submit the Transfer of Ownership Agreement form available on the DEQ website. Changes can be mailed or sent to constructionGP@deq.virginia.gov. DEQ does not need notification of specific changes to a SWM/E&SC plan; those changes should be sent to UVA's Administrator.

3.3.3 Termination – The CGP holder should submit a Notice of Termination (NOT) per 9VAC25-880-60 when:

- Necessary permanent control measures included in the SWPPP for the site are in place and functioning effectively and final stabilization has been achieved on all portions of the site for which the operator is responsible;
- Once another operator has assumed control over all areas of the site that have not been finally stabilized and they have obtained coverage for the ongoing discharge; or
- Coverage under an alternative VPDES or state permit has been obtained.

The NOT should be submitted to DEQ no later than 30 days after one of these conditions have been met. The NOT form is available on the DEQ website. If stormwater BMPs are constructed as part of the project, a complete NOT submittal will also require:

- As-built plans (construction record drawings – see Section 4.3) for all permanent control measures, both digitally and a full-sized paper copy.
- Digital copy of the approved SWM plans.
- A certification statement, signed by the engineer, certifying that the stormwater management facilities have been constructed in accordance with the approved plans and specifications (per 9VAC25-870-55).

The UVA Administrator can help answer any questions on preparing this submittal.

3.4 Pre-Construction Meetings

The UVA Administrator must be notified at least one week prior to holding a pre-construction meeting for any land disturbing activities.

At least two weeks prior to initiating installation of stormwater BMPs, a separate pre-construction meeting shall be held with the operator and any subcontractor involved in the installation as well as the UVA SWM inspector and project manager. The BMP construction inspection checklist for the BMP to be installed will be reviewed with the operator and any subcontractor (Appendix D). All construction milestones that will require approval by inspection will be identified for the particular BMP to be installed at that time. The sequence of construction is discussed and all items that need photo or other documentation (surveys, material certifications, etc.) are identified. E&SC measures must be used throughout BMP construction, and the contributing drainage area must be stabilized before any BMP can be activated.

3.5 Inspections and Enforcement

The Inspector(s) is responsible for determining if the implementation of the project is in accordance with the project specific SWM/E&SC plan and associated SWM/E&SC laws and regulations. Enforcement shall be administered by DEQ. Refer to Section 6.0 for more information on inspections and enforcement procedures.

Licensed professional(s) shall perform inspections and surveys as necessary to support their certification that each permanent stormwater management facility is constructed in accordance with the approved SWM plan.

3.6 Changes and Amendments

An approved plan may be changed by the UVA -Program Administrator in the following cases:

(i) Where inspection has revealed the plan is inadequate to satisfy applicable regulations; or

(ii) Where the person responsible for carrying out the approved plan finds that because of changed circumstances or for other reasons the approved plan cannot be effectively carried out, and proposed amendments to the plan,

consistent with the requirements of this article, are agreed to by the plan-approving authority and the person responsible for carrying out the plan.

Subject to the discretion of the inspector and/or project manager, revisions to an approved SWM/E&SC plan may be made subject to the following restrictions. Formal plan revisions requiring review and approval by a DEQ-certified plan reviewer are only necessary when the changes involve engineered controls (e.g., a sediment trap or basin) or a reduction in the level or quantity of SWM/E&SC. Such revisions must comply with the UVA AS&S for SWM/E&SC and shall not be considered approved until written notice is provided from UVA's Administrator. Plan revisions that do not require resubmittal to the Administrator shall be documented through redline markups that are checked and signed off on by a DEQ-certified inspector.

Regulated land disturbing activity operators shall document on-site changes as they occur to ensure compliance with the requirements of the Virginia Stormwater Management Act and VSMP Regulations.

4.0 CONSTRUCTION PLAN REQUIREMENTS

Complete SWM/E&SC plans shall be provided as part of the overall construction plan and will follow the latest regulations and design standards. All SWM/E&SC plans shall be appropriately sealed and signed by a professional. A copy of the completed plan preparer's checklists (see Appendix A) shall be provided with the submittal. A notation shall be provided for each checklist item, such as a specific plan sheet or narrative section, indicating the location where the requirement is addressed.

Prior to initiating land disturbance, all E&SC/ SWM plans require written approval issued from the Administrator as described in Section 2.1. In addition to the approval letter, all plans are required to be stamped by a DEQ-certified plan reviewer. A copy of the approval-stamped SWM/E&SC plans shall be maintained on-site unless otherwise approved by UVA's Administrator.

4.1 E&SC Plans shall include:

4.1.1 The amount of disturbed area listed per phase and proposed net increase in impervious area. The area which may be disturbed in each phase shall be indicated on the construction plans.

4.1.2 Maps showing existing and final conditions, including land cover, contours and drainage patterns.

4.1.3 Minimum standards (MS) 1 through 19.

4.1.4 A description of the proposed E&SC measures, their location on a site map and details of how they should be installed.

4.1.5 Information on the maintenance of all E&SC measures.

4.1.6 Construction sequence of operations, with staged implementation of E&SC measures for each phase.

4.1.7 Land disturbing activity occurring at a separate location, unless covered in a separate approved plan.

4.1.8 Stockpile/lay-down areas and trailer locations.

4.1.9 Narrative and supporting calculations clearly documenting compliance with MS-19 including:

- Description of the overall project, existing and proposed conditions, site soils, critical and adjacent areas.
- Concentrated stormwater runoff leaving the development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.
- Adequacy of all pipes and channels, including those on-site, shall be verified. If existing channels or pipes are not adequate, the plan shall identify which channel improvement, stormwater detention or other measures will be used to prevent downstream erosion.
- The outfall from any BMP shall provide a stabilized transition to the receiving channel.
- Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system or to a detention facility.
- Compliance with the water quantity minimum standards set out in 9VAC25-870-66 of the VSMP Regulation shall be deemed to satisfy the requirements of MS-19.
- Supporting calculations include but are not limited to ditch computations, stormwater routing, storm inlet computations, pipe capacity computations, etc.

4.2 SWM Plans shall include:

4.2.1 Contact information including the name, address, telephone number, and email address of the owner;

4.2.2 A narrative description of the current and final site conditions, including the function of the project (e.g., low density residential, shopping mall, highway, etc.) and;

4.2.3 Information on the proposed stormwater management facilities, including (i) the type of facilities; (ii) location, including geographic coordinates; (iii) acres treated; and (iv) the surface waters into which the facility will discharge;

4.2.4 Information on the type of and location of stormwater discharges, information on the features to which stormwater is being discharged including surface waters, if present;

4.2.5 Hydrologic and hydraulic computations, including runoff characteristics;

4.2.6 Documentation and calculations verifying compliance with the water quality and quantity requirements of these regulations. SWM calculations include but are not limited to: ditch computations, stormwater routing, storm inlet computations, pipe capacity computations, BMP computations, pond routings and computations, etc.

4.2.7 The following shall be included on the drawings at a minimum: A description of the requirements and recommended schedule for maintenance and maintenance inspection of the stormwater management facilities. The maintenance inspection schedule and maintenance requirements should be in accordance with the Virginia BMP Clearinghouse, the Virginia SWM Handbook, the MS4 permit (if applicable) and/or the manufacturer's specifications. Identify the person or persons who will be responsible for maintenance inspection and maintenance.

4.2.8 Letter of availability from the off-site provider if using off-site compliance options.

4.2.9 A map or maps of the site that depicts the topography of the site and includes:

a. All contributing drainage areas and direction of stormwater flow;

b. Existing streams, ponds, culverts, ditches, wetlands, other water bodies, and floodplains;

c. Soil types, forest cover, and other vegetative areas;

d. Pre- and post-development land use including structures, roads, and locations of utilities and easements. Drawings should clearly depict the types of land cover on the site (i.e. different type of hatching for each land cover), including the acreage for each cover type. The acreage should be labeled in all of the subareas. Also provide a table that adds the land cover up by type on the sheet;

e. Sufficient information on adjoining parcels to assess the impacts of stormwater from the site on these parcels;

f. Limits of land disturbance including steep slopes and natural buffers around surface waters that will not be disturbed. The proposed drainage patterns on the site and approximate slopes anticipated after major grading activities;

g. Proposed buildings, roads, parking areas, utilities, and stormwater management facilities;

h. Profiles shall be included for all closed and open storm systems. The profile shall include the existing surface, final surface, proposed water elevations, pipes, pipe crossings, and hydraulic grade line. Surcharges shall be clearly indicated on the profile;

i. Detailed landscape plan with planting schedule for vegetated BMPs; and

j. Label any conserved open space as "Runoff Reduction Compliance Forest / Open Space," drawing metes and bounds all the way around it. Include the following note: "The Runoff Reduction Compliance Forest/Open Space area shown here shall be maintained in a forest/open space manner until such time that an amended storm water management plan is approved by the VSMP Authority."

4.3 Construction Record Drawings

At the completion of the project, and prior to final acceptance of permanent stormwater management facilities, a construction record drawing ("as-built") must be provided to the Administrator bearing the seal and signature of a Virginia registered professional, certifying that the stormwater management facilities have been constructed in accordance with the approved plans and specifications. The licensed professional shall also provide surveys, photographs, construction logs, inspection reports, geotechnical testing reports, soil reports certification of materials (i.e. stone, gravel, bio-media, etc.), and all other applicable information documenting that the stormwater management facilities were constructed in accordance with the approved SWM plan. Record documentation shall be submitted in Adobe PDF form or another approved digital format. Additionally, record drawings shall be submitted digitally in AutoCAD format. After the as-built submittal has been accepted by the Administrator, the operator shall schedule a final inspection of the BMPs and other applicable stormwater distribution system components by a UVA inspector. The BMP(s) shall not be accepted (and final retainage shall not be released) until the Administrator provides final approval, record drawings accurately reflect the as-built condition, and water quality and quantity requirements have been met.

5.0 VARIANCES AND EXCEPTIONS

5.1 E&SC Plan Variances

Variance requests from the E&SC minimum standards, in accordance with 9VAC25-840-50, may be considered prior to plan approval or during construction.

5.1.1 Applicant requests for project-specific variances shall be sent in writing by the design professional to UVA's Administrator. Requests shall be accompanied by complete details and documentation, including justification for the requested variance from the minimum standard and impacts associated with the variance request. Variance requests shall describe the restrictive site conditions and include the proposed mitigation measures to address the concern. Variances to regulations must ensure off-site properties and resources are protected from damage.

5.1.2 If determined to be appropriate by UVA's Administrator and the Plan Reviewer, then a formal request on AS&S holder letterhead signed by the Administrator will be submitted to the DEQ Central Office for review and approval. The request will also include a copy of the E&SC Plan and AS&S entity information sheet (Appendix B) with "Variance request" indicated in Section 4.

5.1.3 DEQ shall respond in writing either approving or disapproving the variance request. During construction, if DEQ does not approve a variance within 10 days of receipt of the request, the request shall be considered to be disapproved. Following disapproval, the applicant may resubmit a variance request with additional documentation.

5.1.4 All approved variances shall be documented in the plan and listed in the General Notes section of the E&SC plans for land disturbing activities.

5.2 SWM Plan Exceptions

Exception requests from the Virginia Stormwater Management Act SWM Technical criteria and design standards Part IIB or Part IIC of 9VAC25-870 may be considered prior to plan approval in accordance with 9VAC25-870-122.

5.2.1 Applicant requests for project-specific exceptions shall be sent in writing by the design professional to UVA's Administrator. Requests shall be accompanied by complete details and documentation, including justification for the requested exception from the SWM technical criteria and impacts associated with the exception request.

5.2.2 An exception may be granted if:

a. The exception is the minimum necessary to afford relief

b. Reasonable and appropriate conditions will be imposed as necessary upon any exception granted so that the intent of the Virginia Stormwater Management Act and technical criteria are preserved,

c. Granting the exception will not confer any special privileges that are denied in other similar circumstances, and

d. Exception requests are not based upon conditions or circumstances that are self-imposed or self-created.

5.2.3 Economic hardship is not a sufficient reason to request an exception from the technical criteria or design standards and specifications.

5.2.4 Exceptions will not be granted from the following requirements:

a. To obtain a Construction General Permit, unless granted pursuant to Guidance Memo 15-2003 or

b. Use of BMPs included in the Virginia Stormwater BMP Clearinghouse.

5.2.5 Exceptions to requirements for phosphorus reductions shall not be allowed unless offsite options available through 9VAC25-870-69 have been considered and found not available.

5.2.6 If determined to be appropriate by UVA's Administrator and the Plan Reviewer, then a formal request on AS&S holder letterhead signed by the Administrator will be submitted to the DEQ Central Office for review and approval. The request will also include a copy of the E&SC Plan and AS&S entity information sheet (Appendix B) with "SWM Plan exception request" indicated in Section 4.

5.2.7 DEQ shall respond in writing either approving or disapproving the exception request.

5.2.8 A record of all exceptions shall be maintained by the VSMP Authority and UVA Administrator and included as part of the approved SWM plan.

6.0 CONSTRUCTION INSPECTIONS AND ENFORCEMENT

The following inspections will be conducted on behalf of UVA as the AS&S holder. Inspectors shall hold a certificate of competence for project inspector for E&SC or SWM, as applicable, in accordance with 9VAC25-850. Operator inspections are not covered in this section, but the Operator is responsible for conducting inspections outlined by the approved E&SC Plan and, if applicable, the CGP and to ensure that SWM components are installed per the approved SWM plan.

6.1 E&SC Inspections

In lieu of an approved alternative inspection program, periodic inspections shall be conducted, at a minimum, every two weeks and within 48 hours of a rainfall event producing runoff. In addition, inspections shall be made during or immediately following initial installation of erosion and sediment controls and at the completion of the project. Periodic E&SC inspections will be conducted by a DEQ-Certified Inspector for E&SC.

The E&SC inspection report provided in Appendix C shall be used on each site inspection. All E&SC measures shown on the plan shall be inspected. All problems and violations shall be documented on the inspection report. Inspection reports shall specify a corrective action for each problem or violation noted and a date the corrective action must be completed. The status of corrective actions will be noted on the following inspection report or otherwise documented in the project file. A copy of the inspection report will be provided to the project staff.

6.2 VSMP Inspections

Periodic inspections shall be conducted during a project's construction period to verify compliance with the construction general permit and that BMPs and stormwater management measures are constructed in accordance with the design specifications. The inspection schedule will consider project duration and phasing, BMP construction, weather/seasonal conditions, and contractor compliance history. Periodic stormwater management inspections will be conducted by a DEQ-Certified Inspector for SWM.

6.2.1 CGP Compliance Inspections

For construction general permit compliance, the Inspector will assess compliance with the approved SWM/E&SC plans; development, updating, and implementation of a pollution prevention plan; as well as development and implementation of any additional control measures to address TMDLs. An initial stormwater pollution prevention plan (SWPPP) inspection will be conducted at the beginning of land disturbance. SWPPP inspections will then be conducted periodically for the duration of the project or until the site has been stabilized. The VSMP inspection report provided in Appendix C shall be used on each site Inspection. All SWM/E&SC measures shown on the plan shall be inspected. All problems and violations shall be documented on the inspection report. Inspection reports shall specify a corrective action for each problem or violation noted and a date the corrective action must be completed. A copy of the inspection report will be provided to the project staff.

6.2.2 BMP Construction Inspections

Inspections of milestone activities (referenced in Section 3.4) shall be scheduled with a UVA SWM inspector at least one day in advance. The

operator is responsible for performing their own inspections of BMPs to ensure that they are in conformance with the approved stormwater management plan. The operator will be required to remove all material that does not meet DEQ standards or match the specifications, unless approved by the design engineer and SWM inspector. The checklists included in Appendix D shall be used as a guide for inspection and outline the expectations for installation. SWM inspectors will perform periodic inspections in addition to the prescribed milestone inspections to ensure conformance with the approved stormwater management plan and will document the installation with photos as well as the inspection report (Appendix D). Material certifications and photos of the progression of the construction will be kept for documentation by the operator and provided upon request. As-built documents are required upon completion.

6.3 DEQ Inspections

DEQ shall perform random site inspections or inspections in response to a complaint to assure compliance with the Stormwater Management Act, the Erosion and Sediment Control Law, and associated regulations. DEQ will also perform inspections related to the Notice of Termination.

6.4 Other Investigations

E&SC Inspectors will also be responsible for responding in a timely manner to reports of alleged violations reported by University staff, students, adjacent property owners, or others. Corrective measures, if warranted, will follow standard procedures as outlined for SWM/E&SC inspections.

6.5 Enforcement

When violations noted on written E&SC/VSMP inspection reports remain during subsequent inspections, UVA will increase the level of intervention in order to obtain satisfactory response from the Operator.

The following escalating level of response will be used for repeated violations. This enforcement schedule may be adjusted using best engineering judgement based on the spacing of inspections (e.g., if a rainy pattern has multiple inspections in one week) and severity of the issue(s).

i. The operator shall rectify a noted violation as soon as practicable but no later than seven days after the initial discovery and notification.

ii. If the violation has not been corrected on two consecutive inspection reports and after four weeks, the Inspector will alert the UVA Administrator who will contact the UVA project manager to review the issues and develop a resolution schedule. The Operator shall send photo documentation of the corrected items once the item has been corrected.

iii. If a violation continues to be unresolved on three consecutive inspection reports and after six weeks, the Administrator will notify the UVA Director of Capital Construction and Renovation and/ or the Associate Vice President and Chief Facilities Officer of UVA Facilities Management of the issue(s) and determine appropriate enforcement actions. UVA may contractually require the Operator to stand down on land disturbing activity until corrective actions are implemented and verified complete.

iv. If UVA and the Operator cannot reach an appropriate compliance and resolution schedule, UVA shall notify the DEQ Central Office and DEQ Valley or Southwest Regional Office (as applicable) that enforcement actions are recommended. Enforcement shall be administered by DEQ and the Board where applicable in accordance with the provisions of the Stormwater Management Act and Erosion & Sediment Control Law.

DEQ may take enforcement action which includes issuing notices to comply, notices of violation, and implementing other enforcement procedures outlined in 9VAC25-870-116. Stop Work Orders can be issued when:

i. The project has failed to meet the prescribed deadlines in a Notice to Comply;

ii. Land disturbing activities commenced without an approved plan; or

iii. Violations are causing or are in imminent danger of causing harmful erosion of lands or sediment deposition in waters within the watersheds of the Commonwealth.

The Stop Work Order will be lifted once the required SWM/E&SC measures or corrections are in place and verified by DEQ.

7.0 LONG-TERM BMP MAINTENANCE

SWM plans shall contain information on long-term inspection and maintenance of BMPs. The maintenance inspection schedule and maintenance requirements shall be made in accordance with the Virginia BMP Clearinghouse, the Virginia SWM Handbook, the MS4 permit and/or manufacturer's specifications. BMPs must be inspected on an annual basis (at a minimum) and after any storm which causes the capacity of the facility's principal spillway to be exceeded.

UVA Facilities Management or Environmental Resources staff shall inspect and note items identified for cleaning or repair. The inspection results shall be provided to the UVA Administrator for recordkeeping and for assistance with the issuance of a work order to complete the activity, if needed.

8.0 REPORTS AND RECORDKEEPING

8.1 Project Initiation Notification

The Administrator shall notify at least two weeks in advance of a regulated land-disturbing activity. The notification will include the following information:

- Project name or project number;
- Project location (including nearest intersection, latitude & longitude, access pt.)
- On-site project manager name and contact info
- Responsible Land Disturber (RLD) name and contact info
- Project description
- Acreage of disturbance for project
- Project start and finish date
- Any variances/waivers/exemptions associated with this project.

Notifications shall be sent by email to the DEQ Central Office and DEQ Valley or Southwest Regional Office (as applicable). The DEQ Central Office notice shall be sent to StandardsandSpecs@deq.virginia.gov.

8.2 Semi-Annual Land Disturbance Report

UVA shall use the VESCP Land Disturbance Report template provided by DEQ to track new plan approvals for regulated land-disturbing activities. The spreadsheet report will be updated and emailed to the DEQ Central, Valley and Southwest Regional Offices semi-annually prior to June 30 and December 31.

8.3 Annual MS4 Reports

As part of our annual report required for our MS4 permit, UVA will electronically report the stormwater management facilities and BMPs implemented between July 1 and June 30 of each year using the DEQ BMP Warehouse and associated reporting template for any practices not reported as part of the CGP termination process.

8.4 DEQ Discretionary Requirements

Inspection reports conducted by UVA as well as complaint logs and complaint responses may be required to be submitted to DEQ.

UVA may be required to provide weekly e-reporting to the applicable DEQ regional office which includes:

a. Inspection reports;
b. Pictures;
c. Complaint logs and complaint responses; and
d. Other compliance documents.

8.5 Recordkeeping

UVA must maintain the following records as required by the SWM and E&SC Laws and Regulations:

a. Project records including approved SWM/E&SC plans, VRRM spreadsheets, plan preparer's checklists, CGP registration statements and inspection reports shall be kept, either on-site or in AS&S files, for three years after state permit termination or project completion.

b. Stormwater management facility inspection records shall be retained for at least five years from the date of inspection.

c. Construction record drawings, verified VRRM spreadsheets and the as-built stormwater management report shall be maintained in perpetuity or until a stormwater management facility is removed.

Approved E&SC and SWM plans shall be kept on site at each active land disturbing activity and made available upon request.

9.0 ANNUAL STANDARDS AND SPECIFICATIONS REVIEW AND EVALUATION

9.1 DEQ'S RESPONSIBILITIES

DEQ shall provide comprehensive program compliance review and evaluation. DEQ has 60 days after receipt in which to act on any standards and specifications submitted or resubmitted to it for approval. DEQ has the authority to enforce approved specifications and charge fees equal to the lower of (i) $1,000 or (ii) an amount sufficient to cover the costs associated with standard and specification review and approval, project inspections, and compliance.

9.2 UVA'S RESPONSIBILITIES

UVA shall ensure compliance with the approved AS&S. UVA shall submit standards and specifications for DEQ review on an annual basis.

Appendix A

SWM and E&SC Plan Preparer's Checklists

Project Name _____ Project # _____

CHECKLIST

FOR STORMWATER MANAGEMENT PLANS

Reference the plan sheet or report section where the information is noted in the blanks below:

PLAN ELEMENTS (9VAC25-870-55 and 9VAC25-870-160)

_____ Contact information including the name, address, telephone number, and email address of the owner and the tax reference number and parcel number of the property or properties affected.

_____ A narrative that includes a description of current site conditions and final site conditions or if allowed by the VSMP authority, the information provided and documented during the review process that addresses the current and final site conditions.

_____ Information on the type of and location of stormwater discharges, information on the features to which stormwater is being discharged including surface waters or karst features if present, and pre-development and post-development drainage areas.

_____ Information on the proposed stormwater management facilities, including (i) the type and design of facilities; (ii) location, including geographic coordinates; (iii) total acres treated; (iv) impervious acres treated, (v) amount of runoff treated by BMP in acre-feet, (vi) water quality volume in cubic feet, (vii) HUC (6^{th} Order); and (viii) the surface waters or karst features into which the facility will discharge.

_____ A description of the requirements for maintenance of the stormwater management facilities and a recommended schedule of inspection and maintenance. The identification of a person or persons who will be responsible for maintenance.

_____ Comprehensive hydrologic and hydraulic computations of the pre-development and post-development runoff conditions for the required design storms, considered individually.

Documentation and calculations verifying compliance with the water quality and quantity requirements of these regulations (9VAC25-870-63 thru 9VAC25-870-69):

_____ Include a completed VRRM spreadsheet (excel and pdf format)

_____ Include calculations supporting the design of the BMPs specified in the VRRM spreadsheet. They should be consistent with the most recent specifications on the Virginia Stormwater BMP Clearinghouse Website.

_____ For demonstrating compliance with the channel protection criteria, identify the type of stormwater conveyance system(s) from the point of discharge to the point of the limits of analysis and the location and basis of the point of the limits of analysis.

_____ Provide calculations and narrative documenting that post-development peak discharge rates meet the channel protection criteria of the identified stormwater conveyance system (e.g., 2-yr 24-hr storm flows for manmade systems or energy balance calculations).

Prepared/Reviewed By _____ Date _____

_____ Identify if concentrated stormwater flow will be discharged to stormwater conveyance systems that currently do or do not experience localized flooding during the 10-yr 24-hr storm event between the site and the point of the limits of analysis. Identify the location and basis of the point of the limits of analysis under the flood protection criteria.

_____ Provide calculations and narrative documenting that post-development peak discharge rates meet the flood protection criteria (e.g., 10-yr 24-hr storm flows are confined within the system or reduced from pre-development flows) of the identified stormwater conveyance system scenario.

_____ Identify if sheet flow volumes will increase and, if so, evaluate for potential down-gradient impacts. Demonstrate how adverse impacts will be mitigated.

_____ If applicable, describe the type of off-site compliance option selected (e.g. off-site SWM facilities owned by UVA or comprehensive watershed management plan) and document project conformance with conditions for its use.

_____ If an operator intends to meet the SWM requirements through the use of off-site compliance options, where applicable, then a letter of availability from the off-site provider must be included.

A map or maps of the site that depicts the topography of the site and includes:

_____ Overall site plan with pre-developed and post-developed condition drainage areas;

_____ Existing streams, ponds, culverts, ditches, wetlands, other water bodies, and floodplains;

_____ Soil types, geologic formations if karst features are present in the area, forest cover, and other vegetative areas;

_____ Current land use including existing structures, roads, and locations of known utilities and easements;

_____ Sufficient information on adjoining parcels to assess the impacts of stormwater from the site on these parcels;

_____ The limits of clearing and grading, and the proposed drainage patterns on the site;

_____ Proposed buildings, roads, parking areas, utilities, and stormwater management facilities; and

_____ Proposed land use with tabulation of the percentage of surface area to be adapted to various uses, including but not limited to planned locations of utilities, roads, and easements.

_____ All stormwater management and erosion and sediment control plans shall be appropriately sealed and signed by a professional in adherence to all minimum standards and requirements pertaining to the practice of that profession in accordance with Chapter 4 (§54.1-400 et seq.) of Title 54.1 of the Code of Virginia and attendant regulations.

Project Name _____ Project # _____

CHECKLIST

FOR EROSION AND SEDIMENT CONTROL PLANS

NARRATIVE

_____ Project description:

- Briefly describes the nature and purpose of the land-disturbing activity.
- How many acres will be disturbed?
- How much impervious area will the project have in the post-development conditions?
- What are the ultimate developed conditions of the site?

_____ Existing site conditions:

- Provide a description of the existing topography.
- Provide drainage area maps of the site in pre-development and post-development conditions.
- Discuss types of existing vegetation that can be used as erosion control, or areas that are to be left undisturbed and how they will be marked.
- Discuss any existing drainage or erosion problems and how they are to be corrected.

_____ Adjacent areas:

- Provide a description of neighboring areas such as streams, lakes, CBPA Resource Protection Area (RPA), residential areas, roads, etc., which might be affected by the land disturbance.

_____ Off-site areas:

- Describe any off-site land-disturbing activities that will occur (including borrow sites, waste or surplus areas, etc.).
- Will any other areas be disturbed?

_____ Soils:

- Provide a brief description of the soils on the site giving such information as soil name, mapping unit, erodibility (K factor), pH, permeability, depth, texture and soil structure.
- Indicate references for soil information.

_____ Critical areas:

- Provide a description of areas on the site which have potentially serious erosion problems (e.g., steep slopes, channels, RPA, wet weather/ underground springs, etc.).
- Discuss any area of the project which may become critical during the project.

_____ Erosion and sediment control measures:

- Describe the methods which will be used to control erosion and sedimentation on the site.
- List all controls used, list specification numbers in Chapter 3 of the Virginia Erosion and Sediment Control Handbook.
- Discuss why any proposed non-standard VESCH control was selected and how it satisfies the applicable minimum standard(s).
- Discuss sequence of installation and removal for each control selected.
- A schedule of regular inspections and repair of each erosion and sediment control structure should be set forth including the maintenance items to check and perform as well as precautions for large storm events.
- Discuss Temporary Seeding as a means of erosion control and list the types to be used.

_____ Permanent stabilization:

- Provide a brief description, including specifications, of how the site will be stabilized after construction is completed.
- Fertilizer and lime applications are to be in accordance with DEQ E&SC Technical Bulletin #4.

_____ Stormwater runoff considerations:

- Will the development site cause an increase in peak runoff rates?
- Will the increase in runoff cause flooding or channel degradation downstream? Discuss how downstream properties and waterways will be protected (basins, channel improvements, easements, etc.).
- Describe the strategy to control stormwater runoff.
- List or discuss all references for the design of permanent stormwater management facilities.
- Have the possibilities of incorporating low impact development strategies for addressing stormwater management water quality and quantity requirements been investigated?

_____ Calculations:

- Provide detailed calculations for the design of temporary sediment traps and basins, diversions, on-site and off-site channels, permanent stormwater facilities, etc.
- Provide all calculations showing pre- and post-development runoff. Worksheets, assumptions and engineering decisions should be clearly presented.
- Calculations must show that downstream properties and waterways are adequately protected.

SITE PLAN

_____ Vicinity map:

- A small map locating the site in relation to the surrounding area. Include any landmarks which might assist in locating the site.

_____ Indicate north:

- Provide an arrow showing the direction of north in relation to the site.

_____ Limits of clearing and grading:

- Show all areas that will be cleared and graded.
- Provide notes on how these areas will be marked.
- Provide notes and illustrations that clearly indicate areas NOT to be disturbed.

_____ Existing contours:

- Provide a small-scale topographic map of the site showing the existing contours elevations at intervals of 1 to 5 feet depending on the slope of the terrain.
- Should be shown as dashed light lines.

_____ Final contours:

- Show changes to the existing contours, including final drainage patterns.
- Should be shown as heavy solid lines.

_____ Existing vegetation:

- Show the existing tree lines, grassed areas, or other unique vegetation.

_____ Soils:

- Show the boundaries of different soil types.

_____ Existing drainage patterns:

- Show the dividing lines for each drainage area and use arrows to show the direction of flow for the different drainage areas.
- Include the size (acreage) of each drainage area.
- All existing drainage swales and patterns on the site should be located and clearly marked on the topographic map.
- Live or intermittent streams should be shown on the map.

_____ Critical erosion areas:

- All critical, environmentally sensitive, or prohibited areas are to be clearly shown on the plan with notes provided to state the critical nature.

_____ Site Development:

- Show all improvements such as buildings, parking lots, access roads, easements, utility construction, etc.

_____ Location of practices:

- Show the locations of erosion and sediment control and stormwater management practices used on the site.
- Symbols showing vegetation are also to be shown.
- Use the standard symbols and abbreviations in Chapter 3 of the E&SC Handbook.
- A legend denoting symbols, line uses, and other special characters is to be provided.

_____ Off-site areas:

- Identify any off-site land-disturbing activities (e.g., borrow sites, waste areas, etc.). Show location of erosion controls.

_____ Detail drawings:

- All structural practices used should be explained and illustrated with detail drawings.
- All details should list the specification number from the VESCH.
- Alternative E&SC measures must have proper drawings to indicate how and where they will be constructed.
- All plan drawings, elevations, and cross-section drawings are to show the scales used to prepare the drawings.
- Outlet protection schedules are to be provided.

MINIMUM STANDARDS

_____ MS-1 – Temporary and permanent stabilization of denuded areas within 7 days

_____ MS-2 – Protection or stabilization of on-site and off-site soil stockpiles and borrow areas

_____ MS-3 – Permanent vegetative stabilization of denuded areas not otherwise stabilized

_____ MS-4 – Install erosion and sediment controls as the first step in land-disturbing activity

_____ MS-5 – Earthen controls and structures stabilized immediately upon installation

_____ MS-6 – Trap and Basin design

Trap: < 3 acres total drainage area, 134 cubic yards per acre storage

Basin: 3 acres or more total drainage area, 134 cubic yards per acre storage, safely handle a 25-year, 24-hour storm event

Prepared/Reviewed By _____ Date _____

_____ MS-7 – Design and construction of cut and fill slopes

_____ MS-8 – Concentrated flow down cut and fill slopes

_____ MS-9 – Slopes protected from seeps

_____ MS-10 – Operational stormwater inlets must be protected

_____ MS-11 – Outlets must be protected and stormwater conveyance channels stabilized before being made operational

_____ MS-12 – Minimize impacts when working in and around live watercourses

_____ MS-13 – Temporary vehicular stream crossings for more than 2 trips in 6 months

_____ MS-14 – Other federal, state, and local regulations pertaining to work in live watercourses (Required permits COE, DEQ, VPDES, etc.)

_____ MS-15 – Stabilize disturbed bed and banks of watercourses

_____ MS-16 – Utility installations (< 500 feet open trench, stockpile upgradient, filter dewatering effluent, backfill and compact, other safety requirements)

_____ MS-17 – Keep paved or public areas clean

_____ MS-18 – Remove temporary controls within 30 days when no longer needed

_____ MS-19 – Address increases in stormwater volume, velocity, and peak runoff

GENERAL EROSION AND SEDIMENT CONTROL NOTES

ES-1: Unless otherwise indicated, all vegetative and structural erosion and sediment control practices will be constructed and maintained according to minimum standards and specifications of the Virginia Erosion and Sediment Control Handbook, 1992 and the *Virginia Erosion and Sediment Control Regulations*.

ES-2: The Administrator must be notified one week prior to the pre-construction conference, two weeks prior to the commencement of land disturbing activity, and one week prior to the final inspection. The name of the Responsible Land Disturber must be provided to the Administrator before any land-disturbing activity may begin.

ES-3: All erosion and sediment control measures are to be placed prior to or as the first step in clearing.

ES-4: A copy of the approved E&SC plan shall be maintained on the site at all times.

ES-5: Prior to commencing land disturbing activities in areas other than indicated on these plans (including, but not limited to, off-site borrow or waste areas), the contractor shall submit a supplementary E&SC plan to the Administrator for review and approval.

ES-6: The contractor is responsible for installation of any additional erosion control measures necessary to prevent erosion and sedimentation as determined by the Inspector.

ES- 7: All disturbed areas are to drain to approved sediment control measures at all times during land disturbing activities and during site development until final stabilization is achieved, after which, upon approval by the Inspector, the controls shall be removed. Trapped sediment and the disturbed soil areas resulting from the removal of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.

ES-8: During dewatering operations, water shall be pumped into an approved filtering device.

ES-9: The contractor shall inspect all erosion control measures at least every 2 weeks and immediately after each runoff-producing rainfall event. Any necessary repairs or cleanup to maintain the effectiveness of the erosion control devices shall be made immediately.

ES-10: The contractor is responsible for the daily removal of sediment that has been transported onto a paved or public road surface.

ES-11: Seeding operations shall be initiated within 7 days after reaching final grade or upon suspension of grading operations for anticipated duration of greater than 14 days or upon completion of grading operations for a specific area.

ES-12: The contractor shall be responsible for preventing surface and air movement of dust from exposed soils which may present health hazards, traffic safety problems, or harm animal or plant life.

ES-13: A Virginia Stormwater Management Program (VSMP) Permit for the discharge of stormwater from construction activities is required for projects disturbing 1 acre or greater. Visit DEQ's Construction General Permit web page at the following link for more information: https://www.deq.virginia.gov/permits-regulations/permits/water/stormwater-construction

Appendix B

AS&S Entity Information

Annual Standards & Specification (AS&S) Entity Information Sheet

1. Annual Standards & Specifications Entity:	
2. AS&S Coverage Verification	
a. Operator:	
b. Project name:	
c. Estimated Area to be Disturbed (acres):	
3. Plan Approval Verification	
a. Erosion & Sediment Control (ESC) Plan:	
i. ESC Plan Reviewer Name and Certification Number:	
ii. ESC Plan Date:	
iii. ESC Plan Approval Date:	
b. Stormwater Management (SWM) Plan:	
i. Technical Criteria Used:	
ii. SWM Plan Reviewer Name and Certification Number:	
iii. SWM Plan Date:	
iv. SWM Plan Approval Date:	
4. Comments:	

Printed Name:	**Title:**
Signature:	**Date:**

(Please sign in ink. This must be signed by an employee of the AS&S entity who has oversight of this project and is aware of its coverage under their AS&S.)

(Retain a copy of this form onsite and within project specific AS&S files.)

Instructions for completion:

1. AS&S Entity/Holder Name as it appears on the AS&S Approval Letter
2.a. Operator = Owner, operator, developer, person or general contractor that the AS&S holder is allowing to operate under their DEQ approved AS&S.
2.b. Project Name = Name of the construction activity as it appears on the Registration Statement.
2.c. Estimated Area to Be Disturbed = Provide the estimated area (to the nearest one-hundredth acre) to be disturbed by the construction activity. Include the estimated area of land disturbance that will occur at any off-site support activity to be covered under this general permit.
3.a. Erosion & Sediment Control (ESC) Plans **i.** = AS&S ESC plans are required to be reviewed and approved by DEQ-Certified ESC Plan Reviewers. Provide the name and certification number of the qualified individual. **ii.** = Provide the date of the ESC plan. **iii.** = Provide the date the ESC plan was approved.
3.b. Stormwater Management (SWM) Plans **i.** = The technical criteria used for this project will be either IIB or IIC per the SWM Regulations; 9VAC25-870. **ii.** = AS&S SWM plans are required to be reviewed and approved by DEQ-Certified SWM Plan Reviewers. Provide the name and certification number of the qualified individual. **iii.** = Provide the date of the SWM plan. **iv.** = Provide the date the SWM plan was approved.
4. Comments = Indicate whether the project package contains any requests (e.g. SWM plan waiver, Decline to Permit, Variance, Exception, Deviation…) DEQ is the VESCP and VSMP Authority for AS&S Entities. Approval for such requests must be issued by DEQ.

(Further questions can be directed to StandardsandSpecs@deq.virginia.gov)

Appendix C

Periodic AS&S Inspection Report Forms

Reply To:
Environmental Resources
University of Virginia
stormwateradmin@virginia.edu

AS&S E&SC INSPECTION REPORT

Project Name:_____ Project Manager:_____
On-Site Contact Name: _____
Project Location:_____
DEQ-Certified Inspector Name:_____ Inspection Date:_____ Time: _____
Last Rainfall/Storm Date and Amount:_____

STAGE OF CONSTRUCTION

Pre-Construction Conference ☐	*Building Construction* ☐	*Construction of SWM Facilities* ☐
Clearing & Grubbing ☐	*Finish Grading* ☐	*Maintenance of SWM Facilities* ☐
Rough Grading ☐	*Final Stabilization* ☐	*Other:* ☐

Item#	State/Local Regulation(1)	Violation		Description and Location of Problem/Violation(2), Required or Recommended Corrective Actions, and Other Comments/Notes
		Initial	Repeat	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	

(1) Refers to applicable regulation found in the most recent publication of the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840), *Virginia Stormwater Management Program Regulations* (9VAC25-870), or local E&SC/SWM ordinance.
(2) Note whether or not off-site damage resulting from the problem/violation was evident during the inspection.

REQUIRED CORRECTIVE ACTION DEADLINE DATE:_____ **Re-inspection Date:**_____
(MM/DD/YY) **(MM/DD/YY)**

The required corrective action deadline date applies to all violations noted on this report. If listed violation(s) currently constitute non-compliance and/or required corrective actions are not completed by the deadline, a **NOTICE TO COMPLY** and/or other enforcement actions may be issued to the entity responsible for ensuring compliance on the above project.

Inspector:_____ _____ _____
Signature Date Phone

Acknowledgement of onsite report receipt: _____ _____ _____
Print Name *Signature* *Date*

This report will be provided to the project manager via e-mail within two business days of inspection.

Reply To:
Environmental Resources
University of Virginia
stormwateradmin@virginia.edu

AS&S E&SC INSPECTION REPORT (continued)

Project Name:_____ Inspection Date:_____

Item#	State/Local Regulation(1)	Violation		Description and Location of Problem/Violation(2), Required or Recommended Corrective Actions, and Other Comments/Notes
		Initial	Repeat	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
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		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	

(1) Refers to applicable regulation found in the most recent publication of the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840), *Virginia Stormwater Management Program Regulations* (9VAC25-870), or local E&SC/SWM ordinance.

(2) Note whether or not off-site damage resulting from the problem/violation was evident during the inspection.

Reply To:
Environmental Resources
University of Virginia
stormwateradmin@virginia.edu

AS&S VSMP CONSTRUCTION PERMIT SITE INSPECTION REPORT

Project Name:_____ Permit Number:_____
On-Site Contact Name: _____
Project Location:_____
DEQ-Certified Inspector Name:_____ Inspection Date:_____ Time: _____
Last Rainfall/Storm Date and Amount:_____

Item		*Yes*	*No*	*N/A*	*Recommended Corrective Action/Notes*
1	Permit registration statement available: § II B.1.a	☐	☐	☐	
2	Permit notice of coverage available: § II B.1.b	☐	☐	☐	
3	Copy of construction general permit available: § II B.1.c	☐	☐	☐	
4	SWPPP available: § II B.1.d, § II B.4, § II E	☐	☐	☐	
5	Detailed site plan available: § II B.1.e	☐	☐	☐	
6	Approved E&SC plan: § II B.2	☐	☐	☐	
7	Approved SWM plan: § II B.3	☐	☐	☐	
8	Identify potential pollutant-generating activities, their location and nonstormwater discharges: § II B.4.a-c	☐	☐	☐	
	Describe P2 practices, procedures and responsible parties: § II B.4.e.1 - 9				
9	Prevent and respond to leaks, spills, other releases	☐	☐	☐	
10	Prevent discharge of spills/leaks from vehicle fueling, maintenance activities	☐	☐	☐	
11	Prevent discharge of soaps, solvents, detergents, wash water from construction materials	☐	☐	☐	
12	Minimize discharge of pollutants from vehicle, equipment washing	☐	☐	☐	
13	Direct concrete wash water into leak-proof container or settling basin	☐	☐	☐	
14	Minimize discharge of pollutants from storage, handling, disposal or construction product, materials and wastes	☐	☐	☐	
15	Prevent discharge of petroleum products, haz/toxic waste, sanitary waste	☐	☐	☐	
16	Address any other potential pollutant-generating activities	☐	☐	☐	
17	Minimize exposure of waste materials to precipitation	☐	☐	☐	
18	Procedures for providing P2 awareness training to personnel: § II B.4.f	☐	☐	☐	
19	Address requirements for discharges to nutrient and sediment impaired waters: § I B.4, § II B.5	☐	☐	☐	
20	Identify qualified personnel and those with delegated authority: § II B.8 - B.9	☐	☐	☐	
21	SWPPP signed in accordance with § III K: § II B.10	☐	☐	☐	
22	SWPPP is being amended (maintained) and updated: § II C.1, C.2 and C.4	☐	☐	☐	
23	Identify person responsible for implementing P2 practices: § II B.4.d, § II C.3	☐	☐	☐	
24	SWPPP revisions are signed in accordance with § III K: § II C.5	☐	☐	☐	
25	Notice of coverage letter posted near the site's entrance: § II D	☐	☐	☐	
26	Info for public access to SWPPP posted near the site's entrance: § II E.3	☐	☐	☐	
27	Control measures properly maintained in effective operation: § II F, § II H	☐	☐	☐	
28	Inspections conducted by qualified personnel: § II G.1	☐	☐	☐	
29	Inspections conducted at required frequency: § II G.2	☐	☐	☐	
30	Inspection reports summarize the scope of the inspections: § II G.3, § II G.4	☐	☐	☐	
31	Inspection reports are part of the SWPPP: § II G.5	☐	☐	☐	

Reply To:
Environmental Resources
University of Virginia
stormwateradmin@virginia.edu

AS&S VSMP CONSTRUCTION PERMIT SITE INSPECTION REPORT (cont.)

Project Name: _____ Permit Number: _____

DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

STAGE OF CONSTRUCTION

Pre-Construction Conference ☐	*Building Construction* ☐	*Construction of SWM Facilities* ☐
Clearing & Grubbing ☐	*Finish Grading* ☐	*Maintenance of SWM Facilities* ☐
Rough Grading ☐	*Final Stabilization* ☐	*Other*_____ ☐

Item#	State/Local Regulation(1)	Violation		Description and Location of Problem/Violation(2), Required or Recommended Corrective Actions, and Other Comments/Notes
		Initial	Repeat	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	

(1) Refers to applicable regulation found in the most recent publication of the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840), *Virginia Stormwater Management Program Regulations* (9VAC25-870), or local E&SC/SWM ordinance.

(2) Note whether or not off-site impacts resulting from the condition observed was evident during the inspection.

REQUIRED CORRECTIVE ACTION DEADLINE DATE: _____ **(MM/DD/YY)** **Re-inspection Date:** _____ **(MM/DD/YY)**

The required corrective action deadline date applies to all violations noted on this report. If listed violation(s) currently constitute non-compliance and/or required corrective actions are not completed by the deadline, a **NOTICE TO COMPLY** and/or other enforcement actions may be issued to the entity responsible for ensuring compliance on the above project.

Inspector: _____ _____ _____

Signature Date Phone

Acknowledgment of onsite report receipt: _____ _____ _____

Print Name *Signature* *Date*

This report will be provided to the project manager via e-mail within two business days of inspection.

Reply To:
Environmental Resources
University of Virginia
stormwateradmin@virginia.edu

AS&S VSMP CONSTRUCTION PERMIT SITE INSPECTION REPORT (cont.) `

Project Name:_____ Inspection Date:_____

Item#	State/Local Regulation(1)	Violation		Description and Location of Problem/Violation(2), Required or Recommended Corrective Actions, and Other Comments/Notes
		Initial	Repeat	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
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		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	

(1) Refers to applicable regulation found in the most recent publication of the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840), *Virginia Stormwater Management Program Regulations* (9VAC25-870), or local E&SC/SWM ordinance.

(2) Note whether or not off-site damage resulting from the problem/violation was evident during the inspection.

Reply To:
Facilities Management
UVA-Wise
1 College Ave
Wise, VA 24293

AS&S E&SC INSPECTION REPORT

Project Name:_____ Project Manager:_____
On-Site Contact Name:_____
Project Location:_____
DEQ-Certified Inspector Name:_____ Inspection Date:_____ Time: _____
Last Rainfall/Storm Date and Amount: _____

STAGE OF CONSTRUCTION

Pre-Construction Conference ☐	*Building Construction* ☐	*Construction of SWM Facilities* ☐
Clearing & Grubbing ☐	*Finish Grading* ☐	*Maintenance of SWM Facilities* ☐
Rough Grading ☐	*Final Stabilization* ☐	*Other*_____ ☐

Item#	State/Local Regulation(1)	Violation		Description and Location of Problem/Violation(2), Required or Recommended Corrective Actions, and Other Comments/Notes
		Initial	Repeat	

Refers to applicable regulation found in the most recent publication of the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840), *Virginia Stormwater Management Program Regulations* (9VAC25-870), or local E&SC/SWM ordinance.
(2) Note whether or not off-site damage resulting from the problem/violation was evident during the inspection.

REQUIRED CORRECTIVE ACTION DEADLINE DATE:_____ **Re-inspection Date:**_____
(MM/DD/YY) **(MM/DD/YY)**

The required corrective action deadline date applies to all violations noted on this report. If listed violation(s) currently constitute non-compliance and/or required corrective actions are not completed by the deadline, a **NOTICE TO COMPLY** and/or other enforcement actions may be issued to the entity responsible for ensuring compliance on the above project.

Inspector:_____ _____ _____
Signature Date Phone

Acknowledgement of onsite report receipt: _____ _____ _____
Print Name *Signature* *Date*

This report will be provided to the project manager via e-mail within two business days of inspection.

Reply To:
Facilities Management
UVA-Wise
1 College Ave.
Wise, VA 24293

AS&S E&SC INSPECTION REPORT (continued)

Project Name:_____ Inspection Date:_____

Item#	State/Local Regulation(1)	Violation		Description and Location of Problem/Violation(2), Required or Recommended Corrective Actions, and Other Comments/Notes
		Initial	Repeat	

Refers to applicable regulation found in the most recent publication of the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840), *Virginia Stormwater Management Program Regulations* (9VAC25-870), or local E&SC/SWM ordinance.

Note whether or not off-site damage resulting from the problem/violation was evident during the inspection.

Reply To:
Facilities Management
UVA-Wise
1 College Ave.
Wise, VA 24293

AS&S VSMP CONSTRUCTION PERMIT SITE INSPECTION REPORT

Project Name:_____ Permit Number:_____
On-Site Contact Name: _____
Project Location:_____
DEQ-Certified Inspector Name:_____Inspection Date: _____ Time: _____
Last Rainfall/Storm Date and Amount: _____

Item		*Yes*	*No*	*N/A*	*Recommended Corrective Action/Notes*
1	Permit registration statement available: § II B.1.a	☐	☐	☐	
2	Permit notice of coverage available: § II B.1.b	☐	☐	☐	
3	Copy of construction general permit available: § II B.1.c	☐	☐	☐	
4	SWPPP available: § II B.1.d, § II B.4, § II E	☐	☐	☐	
5	Detailed site plan available: § II B.1.e	☐	☐	☐	
6	Approved E&SC plan: § II B.2	☐	☐	☐	
7	Approved SWM plan: § II B.3	☐	☐	☐	
8	Identify potential pollutant-generating activities, their location and nonstormwater discharges: § II B.4.a-c	☐	☐	☐	
	Describe P2 practices, procedures and responsible parties: § II B.4.e.1 - 9				
9	Prevent and respond to leaks, spills, other releases	☐	☐	☐	
10	Prevent discharge of spills/leaks from vehicle fueling, maintenance activities	☐	☐	☐	
11	Prevent discharge of soaps, solvents, detergents, wash water from construction materials	☐	☐	☐	
12	Minimize discharge of pollutants from vehicle, equipment washing	☐	☐	☐	
13	Direct concrete wash water into leak-proof container or settling basin	☐	☐	☐	
14	Minimize discharge of pollutants from storage, handling, disposal or construction products, materials and wastes	☐	☐	☐	
15	Prevent discharge of petroleum products, haz/toxic waste, sanitary waste	☐	☐	☐	
16	Address any other potential pollutant-generating activities	☐	☐	☐	
17	Minimize exposure of waste materials to precipitation	☐	☐	☐	
18	Procedures for providing P2 awareness training to personnel: § II B.4.f	☐	☐	☐	
19	Address requirements for discharges to nutrient and sediment impaired waters: § I B.4, § II B.5	☐	☐	☐	
20	Identify qualified personnel and those with delegated authority: § II B.8 - B.9	☐	☐	☐	
21	SWPPP signed in accordance with § III K: § II B.10	☐	☐	☐	
22	SWPPP is being amended (maintained) and updated: § II C.1, C.2 and C.4	☐	☐	☐	
23	Identify person responsible for implementing P2 practices: § II B.4.d, §II C.3	☐	☐	☐	
24	SWPPP revisions are signed in accordance with § III K: § II C.5	☐	☐	☐	
25	Notice of coverage letter posted near the site's entrance: § II D	☐	☐	☐	
26	Info for public access to SWPPP posted near the site's entrance: § II E.3	☐	☐	☐	
27	Control measures properly maintained in effective operation: § II F, § II H	☐	☐	☐	
28	Inspections conducted by qualified personnel: § II G.1	☐	☐	☐	
29	Inspections conducted at required frequency: § II G.2	☐	☐	☐	
30	Inspection reports summarize the scope of the inspections: § II G.3, § II G.4	☐	☐	☐	
31	Inspection reports are part of the SWPPP: § II G.5	☐	☐	☐	

Reply To:
Facilities Management
UVA-Wise
1 College Ave.
Wise, VA 24293

AS&S VSMP CONSTRUCTION PERMIT SITE INSPECTION REPORT (cont.)

Project Name:_____ Permit Number: _____

DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

STAGE OF CONSTRUCTION

Pre-Construction Conference ☐	*Building Construction* ☐	*Construction of SWM Facilities* ☐
Clearing & Grubbing ☐	*Finish Grading* ☐	*Maintenance of SWM Facilities* ☐
Rough Grading ☐	*Final Stabilization* ☐	*Other*_____ ☐

Item#	State/Local Regulation(1)	Violation		Description and Location of Problem/Violation(2), Required or Recommended Corrective Actions, and Other Comments/Notes
		Initial	Repeat	

(1) Refers to applicable regulation found in the most recent publication of the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840), *Virginia Stormwater Management Program Regulations* (9VAC25-870), or local E&SC/SWM ordinance.
(2) Note whether or not off-site impacts resulting from the condition observed was evident during the inspection.

REQUIRED CORRECTIVE ACTION DEADLINE DATE:_____ **Re-inspection Date:**_____
(MM/DD/YY) **(MM/DD/YY)**

The required corrective action deadline date applies to all violations noted on this report. If listed violation(s) currently constitute non-compliance and/or required corrective actions are not completed by the deadline, a **NOTICE TO COMPLY** and/or other enforcement actions may be issued to the entity responsible for ensuring compliance on the above project.

Inspector:_____ _____ _____
Signature Date Phone

Acknowledgement of onsite report receipt: _____ _____ _____
Print Name *Signature* *Date*

This report will be provided to the project manager via e-mail within two business days of inspection.

Appendix D

BMP Construction Inspection Checklists

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: BIORETENTION

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the bioretention practice has been conducted.	☐	☐		
2	Identify the tentative schedule for construction and verify the requirements and schedule for interim inspections and sign-off.	☐	☐		
3	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage, etc.	☐	☐		
4	All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation and erosion control measures have been removed.	☐	☐		
5	Area of bioretention practice has not been negatively impacted during construction (i.e. compaction, contamination of soils).	☐	☐		
6	Stormwater has been diverted around the area of the bioretention practice and perimeter erosion control measures to protect the facility during construction have been installed.	☐	☐		
7	**Certification of Stabilization Inspection**: Inspector certifies that the drainage areas are adequately stabilized in order to convert the sediment basin/trap (if the area has been used for sediment control) and construct the bioretention area.	☐	☐		

Excavation

Item		Yes	No	Date	Corrected Date/Notes
8	Compare the bioretention surface and invert design elevations with the actual constructed elevations of the inflow and outlet inverts and adjust design elevations as needed.	☐	☐		
9	Area of bioretention excavation is marked and the size and location conforms to plan.	☐	☐		
10	If the excavation area has been used as a sediment trap: verify that the bottom elevation of the proposed stone reservoir is lower than the bottom elevation of the existing trap.	☐	☐		
11	Ensure the bottom of the excavation is scarified prior to placement of stone.	☐	☐		
12	Subgrade surface is free of rocks and roots, and large voids. Any voids should be refilled with the base aggregate to create a level surface for the placement of aggregates and underdrain (if required).	☐	☐		
13	No groundwater seepage or standing water is present. Any standing water is pumped to an acceptable sediment trapping practice.	☐	☐		
14	Excavation of the bioretention practice has achieved proper grades and the required geometry and elevations without compacting the bottom of the excavation.	☐	☐		
15	**Certification of Excavation Inspection**: Inspector certifies the successful completion of the excavation steps listed above.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: BIORETENTION (cont.)

Filter Layer, Underdrain, and Stone Reservoir Placement

Item		Yes	No	Date	Corrected Date/Notes
16	All aggregates, including, as required, the filter layer (choker stone & sand), the stone reservoir layer or infiltration sump conform to specifications as certified by quarry.	☐	☐		
17	Underdrain size and perforations meet the specifications.	☐	☐		
18	For Level 2 installations: placement of filter layer and initial lift of stone reservoir layer aggregates with underdrain or infiltration sump, spread (not dumped) to avoid aggregate segregation; or	☐	☐		
19	Impermeable liner, when required, meets project specifications and is placed in accordance with manufacturers specifications.	☐	☐		
20	Sides of excavation covered with geotextile, when required, with 6” overlap prior to placing stone reservoir aggregate; no tears or holes, or excessive wrinkles are present.	☐	☐		
21	Placement of underdrain, observation wells, and underdrain fittings (45 degree wyes, cap at the upstream end, etc.) are in accordance with the approved plans.	☐	☐		
22	Elevations of underdrain and outlet structure are in accordance with approved plans, or as adjusted to meet field conditions.	☐	☐		
23	Placement of remaining lift of stone reservoir layer as needed to achieve the required reservoir depth.	☐	☐		
24	**Certification of Filter Layer and Underdrain Placement Inspection**: Inspector certifies the successful completion of the filter layer and underdrain placement steps listed above.	☐	☐		

Bioretention Soil Media Placement

Item		Yes	No	Date	Corrected Date/Notes
25	Soil media is certified by supplier or contractor as meeting the project specifications.	☐	☐		
26	Soil media is placed in 12-inch lifts to the design top elevation of the bioretention area. Elevation has been verified after settlement (2 to 4 days after initial placement).	☐	☐		
27	Side slopes of ponding area are feathered back at the required slope (no steeper than 3H:1V).	☐	☐		
28	**Certification of Soil Media Placement Inspectio**n: Inspector certifies the successful completion of the soil media steps listed above.	☐	☐		

Pretreatment, Plant Installation and Miscellaneous Structural Features

Item		Yes	No	Date	Corrected Date/Notes
29	Placement of energy dissipators and pretreatment practices (forebays, gravel diaphragms, etc.) are installed in accordance with the approved plans.	☐	☐		
30	Riser, overflow weir, or other outflow structure is set to the proper elevation and functional; or	☐	☐		
31	External bypass structure is built in accordance with the approved plans.	☐	☐		
32	Appropriate number and spacing of plants are installed in accordance with the approved plans.	☐	☐		

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
33	All erosion and sediment control practices have been removed.	☐	☐		
34	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
35	GPS coordinates have been documented for all bioretention practice installations on the parcel.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: BIORETENTION (cont.)

Item	*Additional Comments*

Inspector:________________________________ ______________ __________________

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: CONSTRUCTED WETLANDS

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the constructed wetlands practice has been conducted.	☐	☐		
2	Identify the tentative schedule for construction and verify the requirements and schedule for interim inspections and sign-off.	☐	☐		
3	Subsurface investigation and soils report supports the placement of a constructed wetland practice in the proposed location.	☐	☐		
4	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage, etc.	☐	☐		
5	All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation and erosion control measures have been removed.	☐	☐		
6	**Certification of Stabilization Inspection**: Inspector certifies that the drainage areas are adequately stabilized in order to convert the sediment basin/trap (if the area has been used for sediment control) and construct the wetland.	☐	☐		

Excavation

Item		Yes	No	Date	Corrected Date/Notes
7	Stormwater has been diverted around the area of the constructed wetland to a stabilized conveyance and perimeter erosion control measures to protect the facility during construction have been installed.	☐	☐		
8	Materials (wetland soils and plants, erosion control materials such as stone, soil stabilization matting, etc.) are available and meet specifications.	☐	☐		
9	Construction of the embankment (including core trench, riser and barrel or weir overflow, emergency spillway overflow, outlet protection, etc. if applicable) in accordance with approved plans.	☐	☐		
10	Excavation of internal micro-topographic features: depth zones, aquatic bench, berms with overflow weirs, etc., in accordance with approved plans.	☐	☐		
11	Installation of pretreatment, including forebays, gravel diaphragms, energy dissipators, etc., is in accordance with the approved plans.	☐	☐		
12	Impermeable liner, when required, meets project specifications and is placed in accordance with manufacturers specifications.	☐	☐		
13	Placement of wetland soils and amendments in accordance with approved plans.	☐	☐		
14	**Certification of Excavation Inspection**: Inspector certifies that the excavation has achieved all the appropriate grades and grade transitions as shown on the approved plans.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: CONSTRUCTED WETLANDS (cont.)

Plantings and Installation

Item		Yes	No	Date	Corrected Date/Notes
15	Exposed soils on side slopes, internal berms, and embankments are stabilized with seed mixtures, stabilization matting, mulch, etc., in accordance with approved plans.	☐	☐		
16	External bypass structure is built in accordance with the approved plans.	☐	☐		
17	Appropriate number and spacing of plants are installed and protected in accordance with the approved plans.	☐	☐		

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
18	All erosion and sediment control practices have been removed.	☐	☐		
19	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
20	GPS coordinates have been documented for the constructed wetland installation.	☐	☐		

Item	Additional Comments

Inspector:_____ _____ _____

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: DRY SWALE

Project Name:_____ Project Manager:_____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the dry swale has been conducted.	☐	☐		
2	Identify the tentative schedule for construction and verify the requirements and schedule for interim inspections and sign-off.	☐	☐		
3	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage, etc.	☐	☐		
4	All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation and erosion control measures have been removed.	☐	☐		
5	Area of dry swale has not been negatively impacted during construction (i.e. compaction, contamination of soils).	☐	☐		
6	Stormwater has been diverted around the area of the dry swale and perimeter erosion control measures to protect the facility during construction have been installed.	☐	☐		
7	**Certification of Stabilization Inspection**: Inspector certifies that the drainage areas are adequately stabilized in order to convert the sediment basin/trap (if the area has been used for sediment control) and construct the dry swale.	☐	☐		

Excavation

Item		Yes	No	Date	Corrected Date/Notes
8	Compare the dry swale surface and invert design elevations with the actual constructed elevations of the inflow and outlet inverts and adjust design elevations as needed.	☐	☐		
9	Area of dry swale excavation is marked and the size and location conforms to plan.	☐	☐		
10	If the excavation area has been used as a sediment trap: verify that the bottom elevation of the proposed stone reservoir is lower than the bottom elevation of the existing trap.	☐	☐		
11	Ensure the bottom of the excavation is scarified prior to placement of stone.	☐	☐		
12	Subgrade surface is free of rocks and roots, and large voids. Any voids should be refilled with the base aggregate to create a level surface for the placement of aggregates and underdrain (if required).	☐	☐		
13	No groundwater seepage or standing water is present. Any standing water is pumped to an acceptable sediment trapping practice.	☐	☐		
14	Excavation of the dry swale has achieved proper grades, longitudinal slope, and the required geometry and elevations without compacting the bottom of the excavation.	☐	☐		
15	**Certification of Excavation Inspection**: Inspector certifies the successful completion of the excavation steps listed above.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: DRY SWALE (cont.)

Filter Layer, Underdrain, and Stone Reservoir Placement

Item		Yes	No	Date	Corrected Date/Notes
16	All aggregates, including, as required, the filter layer (choker stone & sand), the stone reservoir layer or infiltration sump conform to specifications as certified by quarry.	☐	☐		
17	Underdrain size and perforations meet the specifications.	☐	☐		
18	For Level 2 installations: placement of filter layer and initial lift of stone reservoir layer aggregates with underdrain or infiltration sump, spread (not dumped) to avoid aggregate segregation; or	☐	☐		
19	Impermeable liner, when required, meets project specifications and is placed in accordance with manufacturers specifications.	☐	☐		
20	Sides of excavation covered with geotextile, when required, with 6” overlap prior to placing stone reservoir aggregate; no tears or holes, or excessive wrinkles are present.	☐	☐		
21	Placement of underdrain, observation wells, and underdrain fittings (45 degree wyes, cap at the upstream end, etc.) are in accordance with the approved plans.	☐	☐		
22	Elevations of underdrain and outlet structure are in accordance with approved plans, or as adjusted to meet field conditions.	☐	☐		
23	Placement of remaining lift of stone reservoir layer as needed to achieve the required reservoir depth.	☐	☐		
24	**Certification of Filter Layer and Underdrain Placement Inspection**: Inspector certifies the successful completion of the filter layer and underdrain placement steps listed above.	☐	☐		

Dry Swale Soil Media Placement

Item		Yes	No	Date	Corrected Date/Notes
25	Soil media is certified by supplier or contractor as meeting the project specifications.	☐	☐		
26	Soil media is placed in 12-inch lifts to the design top elevation of the dry swale. Elevation has been verified after settlement (2 to 4 days after initial placement).	☐	☐		
27	Side slopes of ponding or flow area are feathered back at the required slope (no steeper than 3H:1V).	☐	☐		
28	Dry swale length, bottom width, side slopes, and longitudinal slope are in accordance with the approved plans.	☐	☐		
29	**Certification of Soil Media Placement Inspection**: Inspector certifies the successful completion of the soil media steps listed above.	☐	☐		

Pretreatment, Plant Installation and Miscellaneous Structural Features

Item		Yes	No	Date	Corrected Date/Notes
30	Placement of energy dissipators and pretreatment practices (forebays, gravel diaphragms, etc.) are installed in accordance with the approved plans.	☐	☐		
31	Riser, overflow weir, or other outflow structure is set to the proper elevation and functional; or.	☐	☐		
32	External bypass structure is built in accordance with the approved plans.	☐	☐		
33	Appropriate number and spacing of check dams are installed in accordance with the approved plans (verification of energy dissipators at downstream toe, depth keyed into dry swale flow line, and tied back into dry swale side slopes).	☐	☐		
34	Appropriate number and spacing of plants are installed in accordance with the approved plans.	☐	☐		
35	Apply erosion control matting as required by approved plans or as needed to ensure adequate stabilization.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: DRY SWALE (cont.)

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
36	All external erosion and sediment control practices have been removed.	☐	☐		
37	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
38	GPS coordinates have been documented for all dry swale installations on the parcel.	☐	☐		

Item	Additional Comments

Inspector:_____ _____ _____

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: EXTENDED DETENTION

Project Name:_____ Project Manager:_____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name:_____ Inspection Date:_____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the ED pond has been conducted.	☐	☐		
2	Identify the tentative schedule for construction and verify the requirements and schedule for interim inspections and sign-off.	☐	☐		
3	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage, etc.	☐	☐		
4	All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation and erosion control measures have been removed.	☐	☐		
5	**Certification of Stabilization Inspection**: Inspector certifies that the drainage areas are adequately stabilized in order to convert the sediment pond or trap (if used for sediment control) into a permanent ED pond.	☐	☐		

Excavation

Item		Yes	No	Date	Corrected Date/Notes
6	Excavation of the ED pond geometry (including bottom shape and length: width ratio, side slopes, etc.) achieves the elevations in accordance with approved plans.	☐	☐		
7	Excavation of internal micro-topographic features: micro-pool outlet, forebays, etc., is in accordance with approved plans.	☐	☐		
8	Impermeable liner, when required, meets project specifications and is placed in accordance with manufacturers specifications.	☐	☐		
9	**Certification of Excavation Inspection**: Inspector certifies that the excavation has achieved all the appropriate grades, grade transitions, and ED pond geometry as shown on the approved plans.	☐	☐		

Construction of ED Pond Embankment and Principal Spillway

Item		Yes	No	Date	Corrected Date/Notes
10	Stormwater has been diverted around or through the area of the ED pond embankment to a stabilized conveyance; and perimeter erosion control measures to protect the facility during construction have been installed.	☐	☐		
11	Materials for construction of the embankment and principal spillway are available and meet the specifications of the approved plans.	☐	☐		
12	Construction of key trench, principal spillway, including the riser and barrel, anti-seepage controls, outlet protection, etc., is built in accordance with approved plans.	☐	☐		
13	Geotechnical analysis and approval of the core (if required) and embankment material has been provided, and the material has been placed in lifts and compacted in accordance with the approved plans.	☐	☐		
14	**Certification of Embankment and Principal Spillway Inspection**: Inspector certifies that each element of the embankment and principal spillway has been constructed in accordance with the approved plans.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: EXTENDED DETENTION (cont.)

Landscaping Plan and Stabilization

Item		Yes	No	Date	Corrected Date/Notes
15	Exposed soils on pond bottom, side slopes, and buffer areas are stabilized with specified seed mixtures, stabilization matting, mulch, etc., in accordance with approved plans.	☐	☐		
16	Appropriate number and spacing of plants are installed and protected on the aquatic bench and pond buffer in accordance with the approved plans.	☐	☐		

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
17	All erosion and sediment control practices have been removed.	☐	☐		
18	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
19	GPS coordinates have been documented for the ED pond installation.	☐	☐		

Item	Additional Comments

Inspector: _____ _____ _____

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: FILTERING PRACTICES

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the filtering practice and the manufacturer's representative with their installation plans (if necessary) has been conducted.	☐	☐		
2	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage), etc.	☐	☐		
3	All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation and erosion control measures have been removed.	☐	☐		
4	Stormwater has been diverted around the area of the filtering practice and perimeter erosion control measures to protect the facility during construction have been installed.	☐	☐		

Surface Filter

Item		Yes	No	Date	Corrected Date/Notes
5	Excavation of the filtering practice has achieved proper grades and the required geometry for the filter media placement.	☐	☐		
6	No groundwater seepage or standing water is present. Any standing water is dewatered to an acceptable dewatering device.	☐	☐		
7	Installation of the impermeable liner (if required). Liner meets project specifications and is placed in accordance with manufacturers specifications.	☐	☐		
8	All aggregates, including the reservoir layer around the underdrain, the choker stone layer, and the filter media (sand) conform to specifications as certified by quarry.	☐	☐		
9	Underdrain size and perforations meet the specifications.	☐	☐		
10	Placement of the underdrain, observation wells, and underdrain fittings (45 degree wyes, cap at upstream end, etc.) are in accordance with the approved plans.	☐	☐		
11	**Certification of Excavation and Placement of Liner and Underdrains:** Inspector certifies the successful completion of the previous steps for a surface filter.	☐	☐		
12	Placement of the stone aggregate, spread (not dumped) around the underdrain, and placement of the layer of the choker stone in accordance with the approved plans.	☐	☐		
13	Placement of the sand filter media in one-foot lifts.	☐	☐		
14	Verify proper depth of filter media.	☐	☐		
15	Verify surface treatment (vegetation, pea gravel, etc.) in accordance with the approved plans.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: FILTERING PRACTICES (cont.)

Underground Structural Filter

Item		Yes	No	Date	Corrected Date/Notes
16	Excavation of the filtering practice has achieved proper grades and the required geometry for the underground structural housing – typically a vault or container made of concrete of other approved material.	☐	☐		
17	No groundwater seepage or standing water is present. Any standing water is dewatered to an acceptable dewatering device.	☐	☐		
18	Installation of fabric (if needed) and gravel bedding.	☐	☐		
19	Placement of the structural housing and verification of internal and external plumbing invert elevations.	☐	☐		
20	**Certification of Water-Tightness Test Inspection**: Inspector certifies the successful completion of the water-tightness test completed and signed off by contractor or vault supplier.	☐	☐		
21	Installation of perforated pipes and other piping as required, and filter media to the required depth.	☐	☐		
22	Connection of inlet and outlet pipes to the site drainage system.	☐	☐		

All Filters

Item		Yes	No	Date	Corrected Date/Notes
23	**Certification of Opening of Stormwater Inflow to the Filter Inspection**: Inspector certifies that the contributing drainage areas are stabilized and erosion and sediment control practices have been removed.	☐	☐		
24	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
25	GPS coordinates have been documented for all filtering practices on the parcel.	☐	☐		

Item	Additional Comments

Inspector:_____ _____ _____

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: GRASS CHANNELS

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the grass channel practice has been conducted.	☐	☐		
2	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage, etc.	☐	☐		
3	All pervious areas of the contributing drainage areas have been adequately stabilized and erosion control measures have been removed.	☐	☐		
4	Grass channel has not been used during construction; or	☐	☐		
5	Grass channel has been used for construction and is scheduled to be restored by removing construction sediment and incorporating soil amendments.	☐	☐		

Channel Construction and Miscellaneous Structural Features

Item		Yes	No	Date	Corrected Date/Notes
6	Stormwater has been diverted for the construction of the inflow measures (level spreader or gravel diaphragm).	☐	☐		
7	Proper grades have been achieved with light equipment to avoid compaction to provide the required geometry of the grass channel: length and longitudinal slope, bottom width, and side slopes.	☐	☐		
8	Soil amendments, if required, have been incorporated as specified (thickness of compost material and incorporated to the required depth).	☐	☐		
9	Check dams, (driveway culverts, if required, have been installed in accordance with the approved plans (spacing, height, elevation of overflow notch, energy dissipaters, keyed into side slopes, etc.).	☐	☐		
10	Energy dissipater and sediment forebay (if required) have been installed at the areas of concentrated inflow in accordance with the approved plans.	☐	☐		
11	Pretreatment practices have been installed for sheet flow entry.	☐	☐		
12	Channel bed and banks and adjacent disturbed areas have all been adequately stabilized (with matting if required, or needed to ensure a dense vegetative cover) prior to diverting runoff into the channel.	☐	☐		

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
13	All erosion and sediment control practices have been removed.	☐	☐		
14	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
15	GPS coordinates have been documented for all grass channels on the parcel.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: GRASS CHANNELS (cont.)

Item	*Additional Comments*

Inspector:__________________________________ _______________ ____________________

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: INFILTRATION

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the infiltration practice has been conducted.	☐	☐		
3	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage), etc.	☐	☐		
4	Area of infiltration practice has not been impacted during construction.	☐	☐		
5	All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation and erosion control measures have been removed.	☐	☐		

Excavation

Item		Yes	No	Date	Corrected Date/Notes
6	Stormwater has been diverted around the area of the infiltration practice and perimeter erosion control measures to protect the facility during construction have been installed.	☐	☐		
7	Excavation of the infiltration practice has achieved proper grades and the required geometry for the subsurface infiltration trench or the surface infiltration basin without compacting the bottom of the excavation.	☐	☐		
8	**Excavation Inspection Certification**: Inspector certifies the successful completion of the excavation steps listed above.	☐	☐		

Infiltration Construction

Item		Yes	No	Date	Corrected Date/Notes
9	For infiltration trenches, placement of filter fabric, as required, on the side slopes.	☐	☐		
10	Bottom of trench has been scarified.	☐	☐		
11	Six-inch filter layer of sand placed on the trench bottom.	☐	☐		
12	Observation well placed.	☐	☐		
13	Remaining stone aggregate placed (not dumped) in 6-inch lifts.	☐	☐		
14	Top surface of infiltration practice in accordance with approved plans.	☐	☐		
15	**Certification of Infiltration Construction**: Inspector certifies the successful completion of the construction steps listed above.	☐	☐		

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
15	All erosion and sediment control practices have been removed.	☐	☐		
16	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
17	GPS coordinates have been documented for all infiltration practices on the parcel.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: INFILTRATION (cont.)

Item	*Additional Comments*

Inspector:______________________________ _______________ ____________________

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: PERMEABLE PAVEMENT

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Determine when permeable pavement is built in project construction sequence; before or after building construction and determine measures for protection and surface cleaning.	☐	☐		
2	Identify the tentative schedule for construction and verify the requirements and schedule for interim inspections and sign-off.	☐	☐		
3	Aggregate material locations identified (hard surface or on geotextile).	☐	☐		

Sediment Management

Item		Yes	No	Date	Corrected Date/Notes
4	Access routes for delivery and construction vehicles identified.	☐	☐		
5	Vehicle tire/track washing station location/maintenance identified.	☐	☐		
6	Contributing drainage areas are stabilized and are not eroding.	☐	☐		

Excavation

Item		Yes	No	Date	Corrected Date/Notes
7	Excavation size and location conforms to plan.	☐	☐		
8	Runoff is diverted around the excavation area to a stabilized conveyance.	☐	☐		
9	Subgrade surface is free of rocks and roots, and large voids. Any voids should be refilled with the base aggregate to create a level surface for the placement of aggregates and underdrain (if required).	☐	☐		
10	Ensure the bottom of the excavation is scarified prior to placement of stone.	☐	☐		
11	No groundwater seepage or standing water is present. Any standing water is dewatered to an acceptable dewatering device.	☐	☐		
12	The excavation has achieved the proper elevations and grade as noted on the approved plans.	☐	☐		
13	**Certification of Excavation Inspection**: Inspector certifies the successful completion of the Excavation steps listed above.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: PERMEABLE PAVEMENT (cont.)

Filter Layer and Underdrain Placement

Item		Yes	No	Date	Corrected Date/Notes
14	All aggregates, including, as required, the filter layer (choker stone & sand), the reservoir layer, and bedding layer are clean and washed and otherwise conform to specifications as certified by quarry.	☐	☐		
15	Underdrain size and perforations meet the specifications.	☐	☐		
16	Placement of filter layer and initial layer of reservoir layer aggregates (approximately 2 inches) spread (not dumped) to avoid aggregate segregation; or	☐	☐		
17	Impermeable liner meets project specifications and is placed in accordance with manufacturers specifications.	☐	☐		
18	Placement of underdrain, observation wells, and underdrain fittings (45 degree wyes, cap at upstream end, etc.) in accordance with the approved plans.	☐	☐		
19	Invert elevations of underdrain and outlet structure and surface gradient in accordance with approved plans.	☐	☐		
20	**Certification of Filter Layer and Underdrain Placement Inspection:** Inspector certifies the successful completion of the filter layer and underdrain placement steps listed above.	☐	☐		

Stone Reservoir Aggregate Placement

Item		Yes	No	Date	Corrected Date/Notes
21	Sides of excavation covered with geotextile, when required, prior to placing stone reservoir aggregate; no tears or holes, or excessive wrinkles are present.	☐	☐		
22	Thickness, placement, compaction and surface tolerances meet specifications and approved plans.	☐	☐		
23	**Certification of Stone Reservoir Aggregate Placement Inspection**: Inspector certifies the successful stone reservoir layer placement steps listed above.	☐	☐		

Bedding Layer and Pavement Installation

Item		Yes	No	Date	Corrected Date/Notes
24	**Certification of Pavement Installation**: Contractor and/or manufacturer certifies that permeable pavement has been placed in accordance with manufacturers specifications (surface is even, runoff spreads evenly across surface, etc.).	☐	☐		

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
25	Pre-treatment structures (if applicable) are properly installed.	☐	☐		
26	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
27	GPS coordinates have been documented for all permeable pavement installations on the parcel.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: PERMEABLE PAVEMENT (cont.)

Item	*Additional Comments*

Inspector:______________________________________ ________________ _____________________

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: RAINWATER HARVESTING

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the rainwater harvesting practice and the manufacturer's representative with their installation plans (if necessary) has been conducted.	☐	☐		
2	Rooftop area matches plans.	☐	☐		

Construction

Item		Yes	No	Date	Corrected Date/Notes
3	Diversion system is properly installed.	☐	☐		
4	Pretreatment system is installed.	☐	☐		
5	Mosquito screens are installed on all openings.	☐	☐		
6	Overflow device is installed and discharges as shown on plans.	☐	☐		
7	Rainwater harvesting system foundation is constructed as shown on plans.	☐	☐		
8	Catchment area and overflow area are stabilized.	☐	☐		
9	Secondary runoff reduction practice(s) is installed as shown on plans.	☐	☐		
10	Inflow and outflow pipes and distribution system are constructed in accordance with the approved plans and have been tested for water-tightness.	☐	☐		
11	**Certification of Construction Inspection**: Inspector certifies the successful completion of the construction steps listed above.	☐	☐		

Documentation

Item		Yes	No	Date	Corrected Date/Notes
12	Verify that warranty information has been submitted for materials and workmanship.	☐	☐		
13	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
14	GPS coordinates have been documented for all rainwater harvesting devices on the parcel.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: RAINWATER HARVESTING (cont.)

Item	*Additional Comments*

Inspector:______________________________________ ________________ _____________________

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: ROOFTOP DISCONNECTION

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the disconnection practice has been conducted.	☐	☐		
2	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage (other than those needed for the disconnection practice), etc.	☐	☐		
3	All pervious areas adjacent to the impervious cover have been adequately stabilized.	☐	☐		

Construction

Item		Yes	No	Date	Corrected Date/Notes
4	Downspouts have been installed and proper drainage away from the building foundation has been provided.	☐	☐		
5	Topsoil and/or soil amendments are nearby and certified as meeting the design specifications.	☐	☐		
6	Downspout runoff has been temporary diverted to a stabilized conveyance.	☐	☐		
7	Erosion and sediment control practices are either in place to protect the area, or if no longer needed, removed.	☐	☐		
8	Proper grades have been achieved with light equipment to avoid compaction to provide the required geometry of the disconnection practice: length and width, and slope; or	☐	☐		
9	Proper grades have been achieved to provide the required geometry of the disconnection practice: length and width, and slope, and the area has been rototilled to reverse the soil compaction resulting from construction traffic.	☐	☐		
10	Pretreatment level spreader or energy dissipaters have been installed per the approved plans.	☐	☐		
11	Soil amendments, if specified, have been incorporated as specified (thickness of compost material and incorporated to the required depth).	☐	☐		
12	Disconnection filter path is completely stabilized with adequate mulch (stabilization matting, such as EC-3, or other equally effective practice).	☐	☐		
13	**Certification of Construction Inspection**: Inspector certifies the successful completion of the construction steps listed above.	☐	☐		

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
14	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
15	GPS coordinates have been documented for all disconnection practices on the parcel.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: ROOFTOP DISCONNECTION (cont.)

Item	***Additional Comments***

Inspector:______________________________________ ________________ _____________________

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: SHEET FLOW

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Sheet Flow to Conserved Open Space Areas

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the sheet flow practice has been conducted.	☐	☐		
2	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage, etc.	☐	☐		
3	All pervious areas of the contributing drainage areas have been adequately stabilized and erosion control measures have been removed.	☐	☐		
4	Area of the Conserved Open Space has been clearly marked and protected from construction traffic with adequate signage and fencing, and is in good condition (undisturbed – other than for pruning or other vegetation management needs).	☐	☐		
5	Area of the Conserved Open Space has been clearly marked and protected from construction runoff and sediment with appropriate sediment control measures (super silt fence, berms, etc.).	☐	☐		
6	Stormwater has been diverted for the construction of the inflow (Level Spreader or gravel diaphragm).	☐	☐		
7	Any light grading required to establish the upper boundary of the Conserved Open Space has been performed with light equipment and minimal impact to the existing vegetation.	☐	☐		
8	Construction of engineered Level Spreader for concentrated inflow or a gravel diaphragm or other pretreatment measure for sheet flow has been completed and the area stabilized as needed.	☐	☐		
9	Stormwater runoff directed into Conserved Open Space after the area at the upper boundary has been stabilized.	☐	☐		
10	All erosion and sediment control practices have been removed.	☐	☐		
11	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
12	GPS coordinates have been documented for all Conserved Open Spaces on the parcel.	☐	☐		

Sheet Flow to Vegetated Filter Strips

Item		Yes	No	Date	Corrected Date/Notes
13	Pre-construction meeting with the contractor designated to install the sheet flow practice has been conducted.	☐	☐		
14	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage, etc.	☐	☐		
15	All pervious areas of the contributing drainage areas have been adequately stabilized and erosion control measures have been removed.	☐	☐		
16	Area of the Vegetated Filter Strip has been clearly marked and protected from construction traffic with adequate signage and fencing, and is in good condition; or	☐	☐		
17	Area of the Vegetated Filter Strip has been previously (temporarily) stripped of topsoil during construction is scheduled for restoration and soil amendments (if required).	☐	☐		
18	Topsoil and/or soil amendments are nearby and certified as meeting the design specifications.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: SHEET FLOW (cont.)

19	Proper grades have been achieved with light equipment to avoid compaction to provide the required geometry of the disconnection practice: length and width, and slope, and prepare the upper boundary has been performed.	☐	☐		
20	Stormwater has been diverted for the construction of the inflow measures (Level Spreader or gravel diaphragm).	☐	☐		
21	Soil amendments, if specified, have been incorporated as specified (thickness of compost material and incorporated to the required depth).	☐	☐		
22	Construction of engineered Level Spreader for concentrated inflow or a gravel diaphragm or other pretreatment measure for sheet flow has been completed.	☐	☐		
23	The entire area of the Vegetated Filter Strip has been stabilized and achieved a dense turf cover prior to diverting runoff into the practice.	☐	☐		

Documentation and Closeout

Item		*Yes*	*No*	*Date*	*Corrected Date/Notes*
24	All erosion and sediment control practices have been removed.	☐	☐		
25	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
26	GPS coordinates have been documented for all Vegetated Filter Strips on the parcel.	☐	☐		

Item	*Additional Comments*

Inspector:_____ _____ _____

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: VEGETATED ROOF

Project Name: _____ Project Manager: _____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name: _____ Inspection Date: _____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the vegetated roof has been conducted.	☐	☐		
2	Identify the tentative schedule for construction and verify the requirements and schedule for interim inspections and sign-off.	☐	☐		

Waterproofing and Drainage Layer Installation

Item		Yes	No	Date	Corrected Date/Notes
3	Ensure that waterproofing layer is properly installed and watertight.	☐	☐		
4	Ensure that the drainage layer is installed per the plans and manufacturer's recommendations.	☐	☐		
5	Make sure that the drainage system is placed at proper slopes, protected, and connected to outlet.	☐	☐		

Growing Media Placement

Item		Yes	No	Date	Corrected Date/Notes
6	Confirm that growing media meets the specifications and is applied to the correct depth.	☐	☐		

Plant Installation

Item		Yes	No	Date	Corrected Date/Notes
7	Ensure that the plants match the planting plan and are installed as shown on the approved plans.	☐	☐		

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
8	Warranty is in place and a schedule has been developed to determine adequacy before warranty period has ended.	☐	☐		
9	Log the vegetated roof's GPS coordinates and submit them for entry into the local BMP maintenance tracking database.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: VEGETATED ROOF (cont.)

Item	*Additional Comments (cont.)*

Inspector:______________________________________ ________________ ____________________

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: WET POND

Project Name:_____ Project Manager:_____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name:_____ Inspection Date:_____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the wet pond has been conducted.	☐	☐		
2	Identify the tentative schedule for construction and verify the requirements and schedule for interim inspections and sign-off.	☐	☐		
3	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage, etc.	☐	☐		
4	All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation and erosion control measures have been removed.	☐	☐		
5	**Certification of Stabilization Inspection**: Inspector certifies that the drainage areas are adequately stabilized in order to convert the sediment pond or trap (if used for sediment control) into a permanent wet pond.	☐	☐		

Construction of Wet Pond Embankment and Principal Spillway

Item		Yes	No	Date	Corrected Date/Notes
6	Stormwater has been diverted around or through the area of the wet pond embankment to a stabilized conveyance; and perimeter erosion control measures to protect the facility during construction have been installed.	☐	☐		
7	Materials for construction of the embankment and principal spillway are available and meet the specifications of the approved plans.	☐	☐		
8	Construction of key trench, principal spillway, including the riser and barrel, anti-seepage controls, outlet protection, etc., is built in accordance with approved plans.	☐	☐		
9	Geotechnical analysis and approval of the core (if required) and embankment material has been provided, and the material has been placed in lifts and compacted in accordance with the approved plans.	☐	☐		
10	**Certification of Embankment and Principal Spillway Inspection**: Inspector certifies that each element of the embankment and principal spillway has been constructed in accordance with the approved plans.	☐	☐		

Excavation

Item		Yes	No	Date	Corrected Date/Notes
11	Excavation of the wet pond geometry (including bottom width, side slopes, check dams, weir overflow and outlet protection, etc.) achieves the elevations in accordance with approved plans.	☐	☐		
12	Excavation of internal micro-topographic features: deep pool, forebays, etc., is in accordance with approved plans.	☐	☐		
13	Impermeable liner, when required, meets project specifications and is placed in accordance with manufacturers specifications.	☐	☐		
14	**Certification of Excavation Inspection**: Inspector certifies that the excavation has achieved all the appropriate grades, grade transitions, and wet pond geometry as shown on the approved plans.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: WET POND (cont.)

Landscaping Plan and Stabilization

Item		Yes	No	Date	Corrected Date/Notes
15	Exposed soils on pond side slopes above permanent pool elevation are stabilized with specified seed mixtures, stabilization matting, mulch, etc., in accordance with approved plans.	☐	☐		
16	Appropriate number and spacing of plants are installed and protected on the aquatic bench and pond buffer in accordance with the approved plans.	☐	☐		

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
17	All erosion and sediment control practices have been removed.	☐	☐		
18	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
19	GPS coordinates have been documented for the wet pond installation.	☐	☐		

Item	Additional Comments

Inspector:_____ _____ _____

Signature Date Phone

Facilities Management
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

CONSTRUCTION INSPECTION CHECKLIST: WET SWALE

Project Name:_____ Project Manager:_____
On-Site Contact Name: _____
Project Location: _____
DEQ-Certified Inspector Name:_____ Inspection Date:_____ Time: _____

Pre-Construction Meeting

Item		Yes	No	Date	Corrected Date/Notes
1	Pre-construction meeting with the contractor designated to install the wet swale practice has been conducted.	☐	☐		
2	Identify the tentative schedule for construction and verify the requirements and schedule for interim inspections and sign-off.	☐	☐		
3	Impervious cover has been constructed/installed and area is free of construction equipment, vehicles, material storage, etc.	☐	☐		
4	All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation and erosion control measures have been removed.	☐	☐		
5	**Certification of Stabilization Inspection**: Inspector certifies that the drainage areas are adequately stabilized in order to convert the drainage conveyance feature (if used for sediment control or diversion) into a wet swale.	☐	☐		

Excavation

Item		Yes	No	Date	Corrected Date/Notes
6	Stormwater has been diverted around the area of the wet swale to a stabilized conveyance and perimeter erosion control measures to protect the facility during construction have been installed.	☐	☐		
7	Materials (wetland soils and plants, erosion control materials such as stone, soil stabilization matting, etc.) are available.	☐	☐		
8	Construction of the wet swale geometry (including bottom width, side slopes, check dams, weir overflow and outlet protection, etc.) in accordance with approved plans.	☐	☐		
9	Excavation of internal micro-topographic features: earthen check dams, tree check dams, forebays, etc., in accordance with approved plans.	☐	☐		
10	Installation of pretreatment, including forebays, gravel diaphragms, energy dissipators, etc., is in accordance with the approved plans.	☐	☐		
11	Impermeable liner, when required, meets project specifications and is placed in accordance with manufacturers specifications.	☐	☐		
12	Placement of wetland soils and amendments in accordance with approved plans.	☐	☐		
13	**Certification of Excavation Inspection**: Inspector certifies that the excavation has achieved all the appropriate grades, grade transitions, and wet swale geometry as shown on the approved plans.	☐	☐		

Plantings and Stabilization

Item		Yes	No	Date	Corrected Date/Notes
14	Exposed soils on swale bottom and side slopes are stabilized with seed, stabilization matting, mulch, etc., in accordance with approved plans.	☐	☐		
15	External bypass structure is built in accordance with the approved plans.	☐	☐		
16	Appropriate number and spacing of plants are installed and protected in accordance with the approved plans.	☐	☐		

CONSTRUCTION INSPECTION CHECKLIST: WET SWALE (cont.)

Documentation and Closeout

Item		Yes	No	Date	Corrected Date/Notes
17	All erosion and sediment control practices have been removed.	☐	☐		
18	Follow-up inspection and as-built survey/certification has been scheduled.	☐	☐		
19	GPS coordinates have been documented for all wet swale installations on the parcel.	☐	☐		

Item	Additional Comments

Inspector:_____ _____ _____

Signature Date Phone

Appendix E

Nutrient Credit Ledgers

UNIVERSITY OF VIRGINIA
ALDERMAN CISTERN SWM LEDGER

updated:
9/26/2023

Project Name	UVA WO #	Design Criteria (IIB or IIC)	BMP Type	Project Status	Installation Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY INPUTS:								
Alderman Library Addition	P04825	IIB	Rainwater Harvesting Cister	Constructed	23-Nov	JR14	2.20	3,897

Project Name	UVA WO #	Design Criteria (IIB or IIC)	CGP Number	Project Status	Completion Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY DEDUCTIONS:								
Alderman Library Addition	P04825	IIB	VAR10-12-101351	Under Construction	TBD	JR14	1.21	3,507
Contemplative Commons	3026263	IIB	VAR10Q434	Under Construction	TBD	JR14	0.28	0
DEDUCTION SUMMARY							1.49	3,507
REMAINING BALANCE							**0.71**	**390**

NOTES:

1. The CC Cistern did not need to use any treatment volume from the Alderman cisterns, only TP reduction.

UNIVERSITY OF VIRGINIA

BRANDON AVENUE GREEN STREET SWM LEDGER

updated:
9/26/2023

Project Name	UVA WO #	Design Criteria (IIB or IIC)	BMP Type	Project Status	Installation Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY INPUTS:								
Brandon Avenue Green Street Cell "A"	2519654	IIB	Bioretention Level 1	Constructed	4/20/2020	JR15	1.92	5,552

Project Name	UVA WO #	Design Criteria (IIB or IIC)	CGP Number	Project Status	Completion Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY DEDUCTIONS:								
Brandon Avenue Green Street	2519654	IIB	VAR10K749	Constructed	4/20/2020	JR15	0.50	1,438
Student Health & Wellness	P04475	IIB	VAR10M135	Constructed	9/24/2021	JR15	0.87	2507
South Lawn Connector	3037764	IIB	NA	Under Construction	TBD	JR15	0.00	0
Brandon UCH II	3037764	IIB	VAR10Q507	Under Construction	TBD	JR15	0.31	897
DEDUCTION SUMMARY							1.68	4,842
REMAINING BALANCE							**0.24**	**710**

NOTES:

UNIVERSITY OF VIRGINIA

BRANDON AVENUE GREEN STREET SWM LEDGER

updated:
9/26/2023

Project Name	UVA WO #	Design Criteria (IIB or IIC)	BMP Type	Project Status	Installation Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY INPUTS:								
Brandon Avenue Green Street Cell "B"	2519654	IIB	Bioretention Level 1	Constructed	4/20/2020	JR15	1.23	3,555

Project Name	UVA WO #	Design Criteria (IIB or IIC)	CGP Number	Project Status	Completion Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY DEDUCTIONS:								
Brandon Avenue Green Street	2519654	IIB	VAR10K749	Constructed	4/20/2020	JR15	0.41	1,196
Student Health & Wellness	P04475	IIB	VAR10M135	Constructed	9/24/2021	JR15	0.44	1263
South Lawn Connector	3037764	IIB	NA	Under Construction	TBD	JR15	0.00	0
Brandon UCH II	3037764	IIB	VAR10Q507	Under Construction	TBD	JR15	0.36	1035
DEDUCTION SUMMARY							1.21	3,494
REMAINING BALANCE							**0.02**	**61**

NOTES:

UNIVERSITY OF VIRGINIA

BRANDON AVENUE GREEN STREET SWM LEDGER

updated:
9/26/2023

Project Name	UVA WO #	Design Criteria (IIB or IIC)	BMP Type	Project Status	Installation Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY INPUTS:								
Brandon Avenue Green Street Cell "C"	2519654	IIB	Bioretention Level 1	Constructed	4/20/2020	JR15	0.91	2,638

Project Name	UVA WO #	Design Criteria (IIB or IIC)	CGP Number	Project Status	Completion Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY DEDUCTIONS:								
Brandon Avenue Green Street	2519654	IIB	VAR10K749	Constructed	4/20/2020	JR15	0.37	1,085
Student Health & Wellness	P04475	IIB	VAR10M135	Constructed	9/24/2021	JR15	0.05	133
South Lawn Connector	3037764	IIB	NA	Under Construction	TBD	JR15	0.09	263
Brandon UCH II	3037764	IIB	VAR10Q507	Under Construction	TBD	JR15	0.31	897
DEDUCTION SUMMARY							0.82	2,378
REMAINING BALANCE							**0.09**	**260**

NOTES:

UNIVERSITY OF VIRGINIA

BRANDON AVENUE GREEN STREET SWM LEDGER

updated:
9/26/2023

Project Name	UVA WO #	Design Criteria (IIB or IIC)	BMP Type	Project Status	Installation Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY INPUTS:								
Brandon Avenue Green Street Cell "D"	2519654	IIB	Bioretention Level 1	Constructed	4/20/2020	JR15	0.89	2,592

Project Name	UVA WO #	Design Criteria (IIB or IIC)	CGP Number	Project Status	Completion Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY DEDUCTIONS:								
Brandon Avenue Green Street	2519654	IIB	VAR10K749	Constructed	4/20/2020	JR15	0.68	1,966
Student Health & Wellness	P04475	IIB	VAR10M135	Constructed	9/24/2021	JR15	0.00	0
South Lawn Connector	3037764	IIB	NA	Under Construction	TBD	JR15	0.00	0
Brandon UCH II	3037764	IIB	VAR10Q507	Under Construction	TBD	JR15	0.00	0
DEDUCTION SUMMARY							0.68	1,966
REMAINING BALANCE							**0.21**	**626**

NOTES:

UNIVERSITY OF VIRGINIA
IVY MSK SWM LEDGER

updated:
9/26/2023

Project Name	UVA WO #	Design Criteria (IIB or IIC)	BMP Type	Project Status	Installation Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY INPUTS:								
Ivy MSK Bioretention A+B		IIB	Bioretention Level 2	Constructed	10/1/2021	JR15	5.59	9,899

Project Name	UVA WO #	Design Criteria (IIB or IIC)	CGP Number	Project Status	Completion Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY DEDUCTIONS:								
Ivy MSK Facility	P04664	IIB	VAR10L401	Constructed	10/1/2021	JR15	5.20	5,552
Ivy Mtn CUP (Included with Ivy MSK calcs above)		IIB	VAR10L401	Constructed	6/25/2021	JR15	0.00	0
Ivy Mtn Parking Addition		IIB	VAR10L401	Constructed	11/30/2022	JR15	0.06	69
Ivy Sanitary Sewer		IIB	VAR10L401	Constructed	11/30/2020	JR15	0.31	621
Parking Booth		IIB	VAR10L401	Constructed	2/7/2023	JR15	0.01	0
DEDUCTION SUMMARY							5.58	6,242
REMAINING BALANCE							**0.01**	**3,657**

NOTES:

UNIVERSITY OF VIRGINIA
NORTH GROUNDS SWM LEDGER

updated:
9/26/2023

Project Name	UVA WO #	Design Criteria (IIB or IIC)	BMP Type	Project Status	Installation Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY INPUTS:								
North Grounds Rec Center Addition[1]	1180196	IIB	Bioretention Level 2	Constructed	09/2014	JR14	1.73	3,764

Project Name	UVA WO #	Design Criteria (IIB or IIC)	CGP Number	Project Status	Completion Date	HUC (6th Order)	Water Quality Allocation (lbs P/year)	BMP Treatment Volume (CF)
TREATMENT CAPACITY DEDUCTIONS:								
North Grounds Rec Center Addition[1]	1180196	IIB	VAR10-12-101351	Constructed	11/2014 (NOT)	JR14	1.43	2,859
North Ground Mechanical Plant Distribution[2]	2794332	IIB	VAR10O707	Constructed	1/15/2022	JR14	0.02	0
DEDUCTION SUMMARY							1.45	2,859
REMAINING BALANCE							**0.28**	**905**

NOTES:

[1] SWM Plan approved by DCR on 4/9/2012.

[2] SWM Plan approved by UVA AS&S on 09/09/2020. This project is within the same watershed, but does not directly drain to the NGRC bioretention facility.

Appendix F

Non-VESCH Control Measures

Appendix F

Non-VESCH Control Measures

LIST OF NON-VESCH PROPRIETARY MEASURES

The following list of proprietary erosion and sediment control measures are approved for use when applied to meet the intent of the Virginia Erosion and Sediment Control Handbook (VESCH) measures.

All non-VESCH measures included in this appendix shall be installed and maintained per the manufacturer's recommendation or follow standard VESCH procedures otherwise. Proposed non-VESCH measures shall be detailed on the plans and described in the narrative to show the intent of the measure it is replacing.

Construction Entrance (Virginia State Minimum Standards and Specifications 3.02)

- AlturnaMats®
- VersaMats®
- FODS® Trackout Control Mats

Silt Fence (Virginia State Minimum Standards and Specifications 3.05)

- Curlex® Sediment Logs®
- Erosion Eel™
- SiltSoxx™
- SMARTfence®36
- Thrace TPG400EOMM Silt Fence

Storm Drain Inlet Protection (Virginia State Minimum Standards and Specifications 3.07)

- Curlex® Sediment Logs®
- Erosion Eel™
- SiltSoxx®
- Dandy Bag®
- Dandy Curb Bag®
- Dandy Sack®
- Dandy Curb Sack®
- Dandy Curb®
- Dandy Pop®
- Silt Sack® (Regular Flow)
- The Grate Bag
- Yellow Jacket Drain Inlet Filter

Dewatering Structure (Virginia State Minimum Standards and Specifications 3.26)

- Dandy Dewatering Bag®
- Dirtbag® Dewatering Bag

Approved Non-VESCH Proprietary Measures

Practice	VA Minimum Standards and Specification	Definition	Purpose	Conditions where practice applies	Planning Considerations	Design Criteria	Construction Specifications	Design Tables and Plates	Maintenance	Inspections
AlturnaMats® & VersaMats ®	3.02	Ground protection mat	Prevent ground compression and rutting	Heavy equipment travel lanes over natural ground where installation of stone construction entrance is not practical.	Needed to prevent damage during heavy equipment travel over fragile or soft natural ground.	Size based on needed travel lane width.	½" thick polyethylene	Note 6	No maintenance required, replace mats as needed.	Note 5
FODS Trackout Control Mats	3.02	Construction entrance system	Prevent ground compression and rutting	Equipment travel lanes over natural ground where installation of stone construction entrance is not practical. Can be used as a substitute for rock and geotextile stabilized construction entrance.	Do not use with metal tracked equipment. Do not use for bridging.	Size based on needed travel lane width.	Mat Size: 12'(w) x 7'(l) x 3 3/4"(h) Pyramid Size: 2 7/8"(h). See Note 3	Note 6	Note 4	Note 5
Curlex® Sediment Logs®	3.05, 3.07	A temporary sediment barrier. Note 1	Note 1	Perpendicular to the flow of water in ditches and swales. As wattles on slopes. As perimeter control. Around inlets and outlets. In place of bales and silt fence.	Light sediment accumulation expected. Fabric will degrade in place if not removed.	Note 3	See Specification Sheet. Note 2	Note 6	Note 4	Note 5
Erosion Eel™	3.05, 3.07	A temporary sediment barrier.	To intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site.	Below disturbed areas where erosion would occur in the form of sheet and rill erosion. DI-1, drop inlet (yard grate) downstream of disturbance. DI-2, curb drop inlet (with grate) downstream of disturbance. DI-3, curb inlet downstream of disturbance.	Light sediment accumulation expected.	Note 3	Note 2 & Note 3	Note 6	See Specification Sheet Section 3	Note 5
SiltSoxx™	3.05, 3.07	Note 1	Note 1	Below disturbed areas where erosion would occur in the form of sheet and rill erosion. DI-1, drop inlet (yard grate) downstream of disturbance. DI-2, curb drop inlet (with grate) downstream of disturbance. DI-3, curb inlet downstream of disturbance.	Light sediment accumulation expected. Do not install if surface is extremely bumpy, rocky, or where elevation changes abruptly.	Note 3	Note 2	Note 6	Note 4	Note 5
SMARTfence®36	3.05	Note 1	Note 1	Below disturbed areas where erosion would occur in the form of sheet and rill erosion.	Heavy sediment accumulation expected. Note 1	Note 3	Woven geotextile. Note 2	Note 6	Note 4	Note 4 & Note 5
Thrace TPG400EOMM Silt Fence	3.05	A temporary sediment barrier consisting of a synthetic filter fabric stretched across and attached to supporting posts and entrenched.	To intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site.	Below disturbed areas where erosion would occur in the form of sheet and rill erosion.	Heavy sediment accumulation expected.	Note 3	Polypropylene woven geotextile. Note 2	Note 6	Note 4	Note 5
Dandy Bag®	3.07	A temporary sediment filter for a storm drain inlet. Note 1	Note 1	DI-1, drop inlet (yard grate) downstream of disturbance.	Light sediment accumulation expected.	Note 3	Note 2	Note 6	Note 4	Note 5
Dandy Curb Bag®	3.07	A temporary sediment filter for a curb and gutter storm drain inlet. Note 1	Note 1	DI-2, curb drop inlet (with grate) downstream of disturbance.	Light sediment accumulation expected.	Note 3	Note 2	Note 6	Note 4	Note 5
Dandy Sack®	3.07	A temporary sediment filter for a storm drain inlet. Note 1	Note 1	DI-1, drop inlet (yard grate) downstream of disturbance.	Heavy sediment accumulation expected.	Note 3	Note 2	Note 6	Note 4	Note 5
Dandy Curb Sack®	3.07	A temporary sediment filter for a curb and gutter storm drain inlet. Note 1	Note 1	DI-2, curb drop inlet (with grate) downstream of disturbances.	Heavy sediment accumulation expected.	Note 3	Note 2	Note 6	Note 4	Note 5
Dandy Curb®	3.07	A temporary sediment filter for a storm drain inlet. Note 1	Note 1	DI-3, curb inlet downstream of disturbance.	Heavy sediment accumulation expected.	Note 3	Note 2	Note 6	Note 4	Note 5
Dandy Pop®	3.07	A temporary sediment filter for a storm drain inlet. Note 1	Note 1	DI-1, drop inlet (yard grate) downstream of disturbance.	Heavy ponding expected.	Note 3	Note 2	Note 6	Note 4	Note 5
Silt Sack® (regular flow)	3.07	A sediment filter around a storm drain drop inlet.	A temporary catch basin filter that removes sediment, trash and debris from entering a catch basin.	DI-1, drop inlet (yard grate) downstream of disturbance.	Heavy sediment accumulation expected.	Note 3	Note 2	Note 6	See Specification Sheet Section 3	Note 5
The Grate Bag	3.07	Note 1	Note 1	DI-1, drop inlet (yard grate) downstream of disturbance.	Light sediment accumulation expected. Note 1 & Note 3	Note 3	Note 2	Note 6	Note 4	Note 5
YellowJacket Drain Inlet Filter	3.07	A temporary sediment filter for a storm drain inlet. Note 1	A temporary catch basin filter that removes sediment, trash and debris from entering a catch basin.	DI-1, drop inlet (yard grate) downstream of disturbance.	Light sediment accumulation expected.	Note 3	Note 2	Note 6	Clean or replace if bag is 1/3 full.	Note 5
Dandy Dewatering Bag™	3.26	A sediment filter for pumping / dewatering applications. Note 1	Note 1	Wherever sediment-laden water must be removed from a construction site by means of pumping.	Heavy sediment accumulation expected.	Note 3	Note 2	Note 6	Note 4	Note 5
Dirtbag® Dewatering Bag	3.26	A sediment filter for pumping / dewatering applications. Note 1	Note 1	Wherever sediment-laden water must be removed from a construction site by means of pumping.	Heavy sediment accumulation expected.	Note 3	Note 2	Note 6	Note 4	Note 5

Notes

1: See product specification sheet, Section 1 – Description

2: See product specification sheet, Section 2 – Material/ Specifications

3: See product specification sheet, Section 3 – Design Criteria Installation

4: See product specification sheet, Section 4 – Maintenance

5: After each storm event and at regular intervals.

6: See end of product specification sheet.

CONSTRUCTION ENTRANCE (VESCH MINIMUM STANDARDS AND SPECIFICATIONS 3.02)

AlturnaMATS®

World's Toughest Ground Protection Mat

ALTURNAMATS Ground Protection Mats LIMITED LIFETIME GUARANTEE

AlturnaMATS *Built Tough!*

The Original Ground Protection Mats Featuring Maximum Traction Diamond Plate Tread Design

These rugged mats are made of 1/2" thick polyethylene so they are virtually indestructible. They withstand vehicles weighing up to 60 tons, bend but do not break and feature a Limited Lifetime Warranty. AlturnaMATS have been tested in record cold and heat. AlturnaMATS are an environmentally friendly mat as they are made from recycled plastic materials.

With AlturnaMATS, getting stuck is virtually eliminated. They are available smooth on one side or smooth on both sides, ideal for removing dirt or gravel.

- Easily supports 60 ton vehicles
- Rugged 1/2" thick polyethylene
- Bold cleat design for great traction
- Build a roadway or working platform in minutes
- Leave turf smooth, even in soft conditions
- No more splintered, warped, water logged plywood
- Simply hosing down leaves the mats clean
- Available in both black or white mats
- Mats can be locked together with Turn-A-Links forming a continuous roadway
- Limited Lifetime Warranty

Sizes to meet your needs

Black	White	Weight
4' x 8'	4' x 8'	86 lbs.
3' x 8'	3' x 8'	64.5 lbs.
3' x 6'	3' x 6'	51 lbs.
2' x 8'	2' x 8'	43 lbs.
2' x 6'	2' x 6'	32.25 lbs.
2' x 4'	2' x 4'	21.5 lbs.


Landscaping


Tree Care


Construction

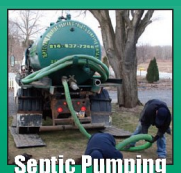

Concrete


Snow/Slush


Manufactured Housing


Recreation Areas & Events


Trenching


Septic Pumping


Utilities


Golf Courses

ATLANTIC DRILLING SUPPLY, INC. ADS

ATLANTIC SUPPLY

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Riviera Beach, FL	800-535-7384
Orlando, FL	800-569-8950
Jacksonville, FL	888-260-5584
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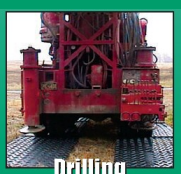
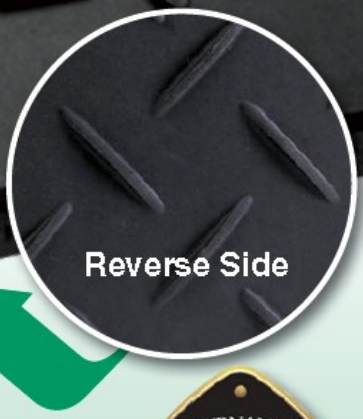
www.ScalesForBusiness.com


Cemeteries


Drilling

VersaMATS

Most Versatile Mats in the Industry



ALTURNAMATS Ground Protection Mats LIMITED LIFETIME GUARANTEE

VersaMATS

Easy to Walk On - Safe to Work On - Great to Drive On
Featuring an Exclusive Slip-Resistant Tread Design

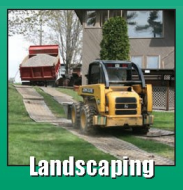
VersaMATS literally are the most versatile ground protection mats in the industry. The flat, slip-resistant tread permits pedestrians to walk safely on the mats, yet they are as rugged as the original AlturnaMATS. The reverse side has the same diamond plate tread as AlturnaMATS, providing great traction for vehicles.

VersaMATS are also available in white, making them ideal for safe use as long walkways even in darkened conditions. They are also available smooth on one side.

- Leaves turf smooth even in soft soil conditions
- Tough 1/2" thick polyethylene
- Two practical cleat designs... for walking and vehicle traffic
- Withstand 60-ton loads
- Build a temporary roadway or walkway in minutes
- Lock together with Turn-A-Links
- Limited Lifetime Warranty

Sizes to meet your needs

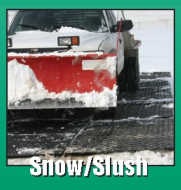
Black	White	Weight
4' x 8'	4' x 8'	86 lbs.
3' x 8'	3' x 8'	64.5 lbs.
2' x 8'	2' x 8'	43 lbs.

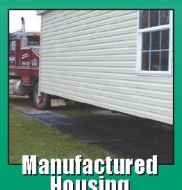

Landscaping


Tree Care


Construction


Concrete


Snow/Slush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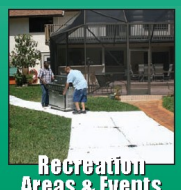
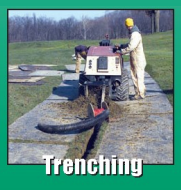

Recreation Areas & Events


Trenching


Septic Pumping


Utilities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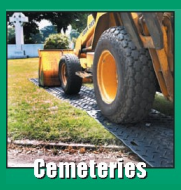

Cemeteries


Drilling

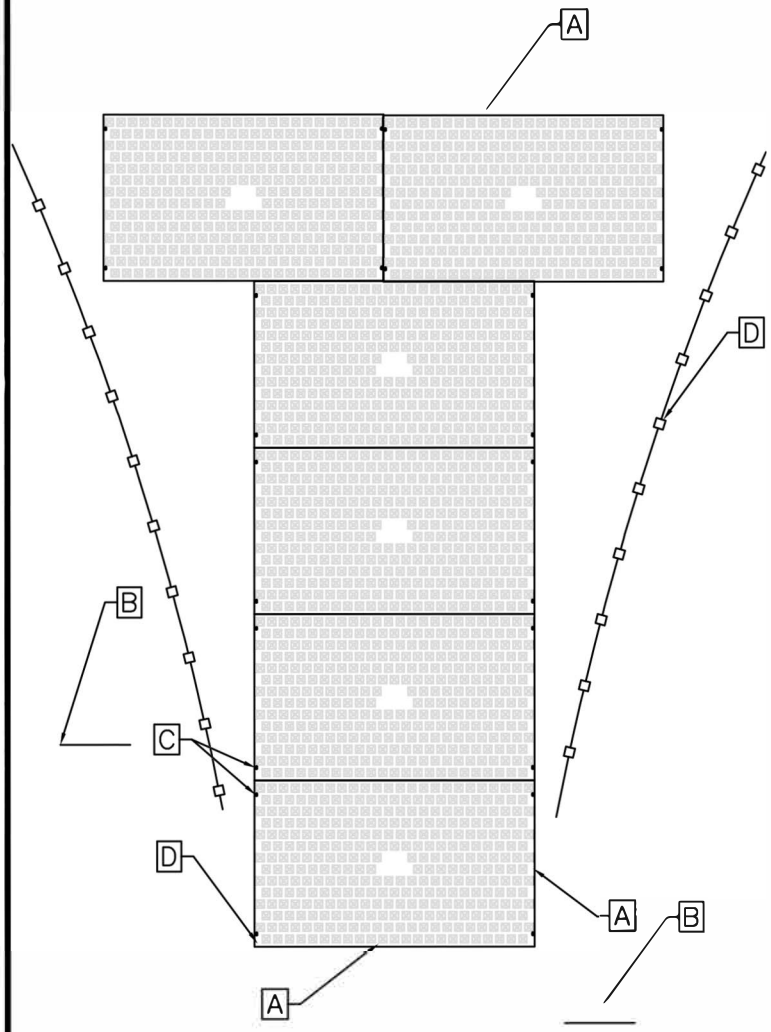
FODS TRACKOUT CONTROL SYSTEM

SECTION 1&2: THE PURPOSE AND DESIGN OF THE FODS TRACKOUT CONTROL SYSTEM IS TO EFFECTIVELY REMOVE MOST SEDIMENT FROM VEHICLE TIRES AS THEY EXIT A DISTURBED LAND AREA ONTO A PAVED STREET. THIS A GENERAL GUIDE FROM WHICH TO INSTALL A FODS TRACKOUT CONTROL SYSTEM. (NOTE: THIS IS NOT A ONE SIZE FITS ALL GUIDE.) THE INSTALLATION MAY NEED TO BE MODIFIED TO MEET THE EXISTING CONDITIONS, EXPECTATIONS, OR DEMANDS OF A PARTICULAR SITE. THIS IS A GUIDELINE. ULTIMATELY THE FODS TRACKOUT CONTROL SYSTEM SHOULD BE INSTALLED SAFELY WITH PROPER ANCHORING AND SIGNS PLACED AROUND THE ENTRANCE AND EXIT TO CAUTION USERS AND OTHERS.

KEY NOTES:

A. FODS TRACKOUT CONTROL SYSTEM MAT.
B. FODS SAFETY SIGN.
C. ANCHOR POINT.
D. SILT OR ORANGE CONSTRUCTION FENCE.

CALL UTILITY NOTIFICATION CENTER
811
CALL 3–BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.



TYPICAL ONE–LANE LAYOUT

SECTION 3: INSTALLATION·

1. THE SITE WHERE THE FODS TRACKOUT CONTROL SYSTEM IS TO BE PLACED SHOULD CORRESPOND TO BEST MANAGEMENT PRACTICES AS MUCH AS POSSIBLE. THE SITE WHERE FODS TRACKOUT CONTROL SYSTEM SHOULD ALSO MEET OR EXCEED THE LOCAL JURISDICTION OR STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS.
2. CALL FOR UTILITY LOCATES 3 BUSINESS DAYS IN ADVANCE OF THE FODS TRACKOUT CONTROL SYSTEM INSTALLATION FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES. CALL THE UTILITY NOTIFICATION CENTER AT 811.
3. ONCE THE SITE IS ESTABLISHED WHERE FODS TRACKOUT CONTROL SYSTEM IS TO BE PLACED, ANY EXCESSIVE UNEVEN TERRAIN SHOULD BE LEVELED OUT OR REMOVED SUCH AS LARGE ROCKS, LANDSCAPING MATERIALS, SUDDEN ABRUPT CHANGES IN ELEVATION, AND SIMILAR. FODS WILL SPAN AND SUPPORT OVER MOST OBSTACLES, BUT THE FLATTER AND SMOOTHER THE TERRAIN UNDER THE FODS TRACKOUT CONTROL SYSTEM WILL BE MORE EFFICIENT AND SAFER.
4. NEXT THE INDIVIDUAL MATS CAN START TO BE PLACED IN POSITION. THE FIRST MAT SHOULD BE PLACED NEXT TO THE PAVED SURFACE AND/OR CURB AT THE CLOSEST POINT OF EGRESS. THIS WILL ENSURE THAT THE VEHICLE WILL EXIT STRAIGHT FROM THE SITE TO THE PAVED SURFACE. FROM THE SITE TO THE PAVED SURFACE.
5. AFTER THE FIRST MAT IS PLACED DOWN IN ITS PROPER LOCATION, AN H BRACKET SHOULD BE PLACED AT THE END OF THE FIRST MAT, BEFORE ANOTHER MAT IS POSITIONED ADJACENT TO THE FIRST MAT.
6. ONCE THE SECOND MAT IS PLACED ADJACENT TO THE FIRST MAT, MAKE SURE THE H BRACKET IS CORRECTLY SITUATED BETWEEN THE TWO MATS.
7. NEXT, THE CONNECTOR STRAP SHOULD BE INSTALLED TO CONNECT THE TWO MATS TOGETHER.
8. AFTER THE FIRST MAT IS PLACED DOWN IN ITS PROPER LOCATION, IT SHOULD BE ANCHORED TO PREVENT THE POTENTIAL MOVEMENT WHILE THE ADJOINING MATS ARE INSTALLED NEXT. ANCHORS SHOULD BE PLACED AT EVERY ANCHOR POINT (IF FEASIBLE) TO HELP MAINTAIN THE MAT IN ITS CURRENT POSITION.
9. ONCE THE FIRST MAT IS ANCHORED DOWN, THE SUCCESSIVE MATS CAN THEN BE PLACED TO CREATE THE FODS® TRACKOUT CONTROL SYSTEM.
10. UPON PLACEMENT OF EACH NEW MAT IN THE SYSTEM, THAT MAT SHOULD BE ANCHORED AT EVERY ANCHOR POINT TO HELP STABILIZE THE MAT AND ENSURE THE SYSTEM IS CONTINUOUS WITH NO GAPS IN BETWEEN THE MATS.
11. AFTER INSTALLATION OF THE FODS TRACKOUT CONTROL SYSTEM, FODS SAFETY SIGNS SHOULD BE PLACED AT THE ENTRANCE AND EXIT SIDES OF THE FODS TRACKOUT CONTROL SYSTEM.
12. A SILT FENCE OR ORANGE CONSTRUCTION FENCE SHOULD ALSO BE INSTALLED ON THE SIDES OF THE FODS TRACKOUT CONTROL SYSTEM TO DIRECT VEHICLES DOWN THE MATS AND BARRICADE PEDESTRIANS FROM CROSSING THE MATS. PEDESTRIANS SHOULD ALSO USE EXTREME CAUTION WHEN CROSSING THE MATS AS THE SURFACE IS UNEVEN AND MAY BE DIFFICULT TO WALK ON.

SECTION 4: USE AND MAINTENANCE

1. VEHICLES SHOULD TRAVEL DOWN THE LENGTH OF THE FODS TRACKOUT CONTROL SYSTEM AND NOT CUT ACROSS THE MATS.
2. DRIVERS SHOULD TURN THE WHEEL OF THEIR VEHICLES SUCH THAT THE VEHICLE WILL TAKE A SERPENTINE ROUTE DOWN THE LENGTH OF THE FODS TRACKOUT CONTROL SYSTEM.
3. MATS SHOULD BE CLEANED ONCE THE VOIDS BETWEEN THE PYRAMIDS BECOME FULL OF SEDIMENT. TYPICALLY THIS TASK WILL NEED TO BE PERFORMED WITHIN TWO WEEKS AFTER A STORM EVENT. BRUSHING IS THE PREFERRED METHOD OF CLEANING, EITHER MANUALLY OR MECHANICALLY.
4. THE USE OF ICE MELT, ROCK SALT, SNOW MELT, DEICER, ETC. SHOULD BE UTILIZED AS NECESSARY DURING THE WINTER MONTHS AND AFTER A SNOW EVENT.

REMOVAL

1. REMOVAL OF FODS TRACKOUT CONTROL SYSTEM IS THE REVERSE ORDER OF THE INSTALLATION.
2. STARTING WITH THE LAST MAT, THE MAT THAT IS PLACED AT THE INNERMOST POINT OF THE SITE OR THE MAT FURTHEST FROM THE EXIT OR PAVED SURFACE SHOULD BE REMOVED FIRST.
3. THE CABLE ANCHORS SHOULD BE CUT WITH WIRE ROPE CUTTERS.
4. THE CONNECTOR STRAPS SHOULD BE UNBOLTED AT ALL LOCATIONS IN THE FODS TRACKOUT CONTROL SYSTEM.
5. STARTING WITH THE LAST MAT IN THE SYSTEM, EACH SUCCESSIVE MAT SHOULD THEN BE MOVED AND STACKED FOR LOADING BY FORKLIFT OR EXCAVATOR ON TO A TRUCK FOR REMOVAL FROM THE SITE.

FIG. 1

FODS
YOUR ENVIRONMENTAL TRACKOUT SOLUTION

TRACKOUT CONTROL MAT

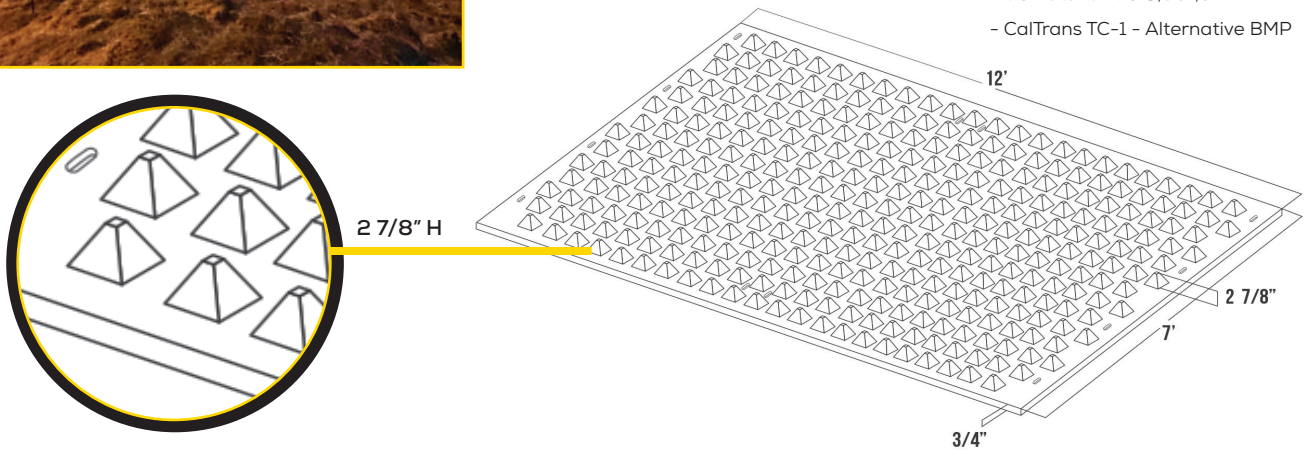
Engineering Data Sheet

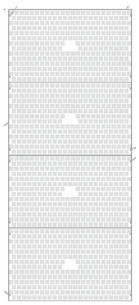
Section 1 - FODS TCM Model # 1100 APPLICATION

The FODS Composite trackout control system is designed to be used as a temporary construction entrance which provides site access while minimizing sediment leaving the site. The top surface of the FODS mat is a geometric pattern formed in the shape of pyramids. The mats are unidirectional and are meant to have the staggered pyramids in the direction of travel. Individual mats are connected together with hardware to form various configurations to fit your jobsite.

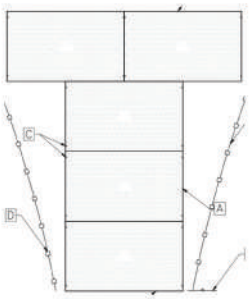
Section 2 - FEATURES

- Re-Usable
- Increased Effectiveness at Reducing Site Trackout
- U/V Stable
- Highly Visible
- Crush rating of 20,000 lbs per pyramid
- Compression Molded HDPE
- Extreme Durability
- Excavation not required
- Chemical Resistant
- Rock-less
- Easy and efficient to transport from site-site
- Mat Size: 12'(w) x 7' (l) x 3 3/4" (t) (2 7/8" pyramid height)
- 3 year manufacture warranty
  - Certification and Compliance
  - US Patent #US 8,061,927 B1
  - CalTrans TC-1 - Alternative BMP

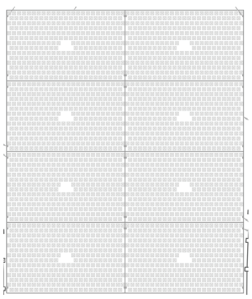




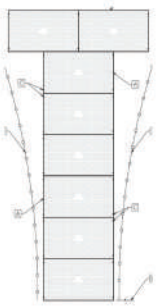
FODS 1x4



FODS 1x4T

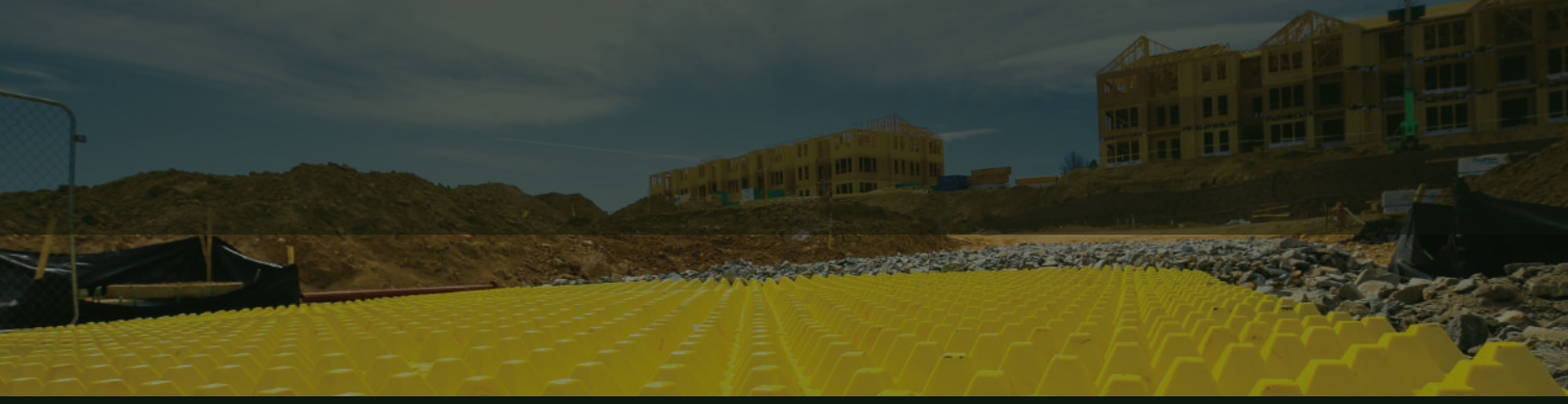


FODS 2x4

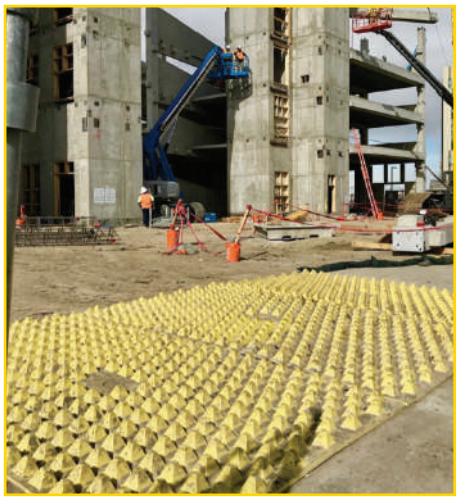


FODS 1x7T

FODS 2x7



FODS Trackout Control Mat - Technical Data Sheet



Section 3 - Suitable Installation Substrate

- Un-Excavated Soil
- Excavated Soil (Min CBR: 4)
- Asphalt
- Concrete
- Rock
- Any existing project substrate

FODS Trackout Control System should be installed near the site exit point, as close to the location where vehicles enter the roadway as is safely as possible. FODS mats should not be installed at a low point on the site where water will pool.

FODS ANCHORING SYSTEMS

- Form-Stakes (18" or 24")
- Cable Earth Anchor
- All-Thread Earth Anchor
- Concrete Sleeve Anchor (asphalt)
- Suitable anchor for substraight

Section 4 - Cleaning / Maintenance

Mats should be cleaned once 2.5" of sediment has accumulated

- Skid-steer broom attachment (enclosed broom for dust control)
- FODS Shovel
- Street Sweeper (requires adjusted bristle head
- Pressure Washer (must have ability to contain water)
- Water Truck (must have ability to contain water)

WARNINGS

- Caution is to be used when crossing mats with metal tracked equipment.
- Equipment with aggressive metal tracks should not cross mats
- Do not drag metal equipment across mats
- Do not use mats for bridging

Before using earth anchors, call 811 for locates to mark underground utilities

811 Know what's below. Call before you dig.

SILT FENCE (VESCH MINIMUM STANDARDS AND SPECIFICATIONS 3.05)

American Excelsior Company®
Earth Science Division

Proud Participant in NTPEP and Proud Member of:

Curlex® Sediment Log®
SPECIFICATION

SECTION 1 - GENERAL

1.01 Summary

A. The sediment log contains excelsior wood fiber for the purpose of slowing water velocity and trapping sediment as described herein.

B. This work shall consist of furnishing and installing the sediment log; including fine grading, installing, staking, and miscellaneous related work, in accordance with these standard specifications and at the locations identified on drawings or designated by the owner's representative. This work shall include all necessary materials, labor, supervision, and equipment for installation of a complete system.

C. All work of this section shall be performed in accordance with the conditions and requirements of the contract documents.

D. The sediment log shall be used to slow water velocity, trap sediment, and enhance revegetation. Based on a project-by-project engineering analysis, the sediment log shall be suitable for the following applications:

1. Perpendicular to the flow of water in ditch bottoms, swales, and waterways
2. As wattles on slopes
3. Around job sites or perimeter control
4. Around inlets and outlets
5. Project ingress and egress termination points
6. All other filtering applications
7. In place of bales, silt fence, and rock checks

1.02 Performance Requirements

A. Sediment log shall provide temporary, biodegradable channel and slope interruption by slowing water velocity to reduce shear stress and soil erosion while enhancing revegetation. Sediment log performance capabilities shall be determined by large-scale testing deemed acceptable by the design engineer.

B. Sediment log performance requirements:

Property	Value	Method
Flow Rate (GPM/ft^2)	≥ 35	ASTM D5141
Soil Retention Effectiveness	≥ 96%	ASTM D7351
Channel Soil Loss Reduction (%)	≥ 50	ASTM D7208
pH Buffering	8 ± 3	ASTM D1117, modified
Functional Longevity[a]	≤ 24 Months	Documented laboratory and field studies
Oil Sorbent	Preapproved	U.S. Environmental Protection Agency
Removal of Polynuclear Aromatic Hydrocarbons (PAHs)	≥ 95%	Quantified research[b]
Fly Ash Filtration (TSS)	≥ 78%	Quantified research[c]
Fly Ash Filtration (NTU)	≥ 76%	Quantified research[c]

[a] Functional longevity varies from region to region because of differences in climatic conditions.

[b] Boving and Zhang, Chemosphere 54 (2004) 831-839.

[c] Kelsey, K. and M. Murley. (2017, January). *Fly Ash Slurry Filtration Using Curlex® Sediment Log® - Quantifying Total Suspended Solids and Turbidity Reduction.* Unpublished internal document, ErosionLab.

1.03 Submittals

A. Submittals shall include complete design data, Product Netting Information, SDS, Installation Guidelines, Manufacturing Material Specifications, Manufacturing Certifications, Staking Pattern Guide, CAD details, and a Manufacturing Quality Control Program. In addition, the Manufacturer shall provide a test report providing data showing the performance capabilities of the sediment log, along with reference installations similar in size and scope to that specified for the project.

1.04 Delivery, Storage, and Handling

A. Sediment log shall be furnished on pallets or master packs.

B. Sediment log may be compressed when packaged. The unique packaging can result in a less than symmetrical shape upon arrival to the jobsite. This will not affect the performance capability of the Sediment log because unique Great Lakes aspen excelsior fibers naturally expand upon wetting and return to a symmetrical tubular shape.

C. Sediment log shall be free of defects and voids that would interfere with proper installation or impair performance.

D. Sediment log shall be stored by the Contractor in a manner that protects them from damage by construction activities.

SECTION 2: MATERIAL/PRODUCTS

2.01 Sediment Log

A. Sediment logs shall be Curlex Sediment Logs, as manufactured by American Excelsior Company, Arlington, TX (800-777-7645).

B. Curlex Sediment Log consist of a specific cut of naturally seed free Great Lakes Aspen wood excelsior with 80% of the fiber ≥ 6 inches in length inside a durable, flexible tubular netting with knotted ends. Curlex Sediment Log is designed to provide intimate contact with the soil, which prevents blowouts and undermining. Curlex Sediment Log allows water to flow through the 100% excelsior matrix, minimizing overtopping, slowing high flow water velocities, and intercepting and stopping silt movement. Curlex Sediment Logs may be installed over bare soil, over rolled erosion control products, on steep slopes, around inlets and outlets, or around jobsites for perimeter control. Curlex Sediment Log shall be manufactured in the U.S.A. at company locations where QA/QC is implemented and managed by the manufacturer. Field fabricated products and products made by anyone other than the manufacturer (i.e. distributors, dealers, etc.) shall not be accepted.

C. Sediment logs shall have the following nominal material characteristics:

PROPERTY	ENGLISH	METRIC
Product Name	6 in 9 in 12 in 20 in	15.2 cm 22.9 cm 30.5 cm 50.1 cm
Minimum Diameter	5.5 in 8.0 in 11.0 in 18.0 in	14.0 cm 20.3 cm 27.9 cm 45.7 cm
Log Density [d] (± 10 %)	(6 in) 2.44 lb/ft^3 (9 in) 2.26 lb/ft^3 (12 in) 2.54 lb/ft^3 (20 in) 1.38 lb/ft^3	39.09 kg/m^3 36.20 kg/m^3 40.69 kg/m^3 22.11 kg/m^3
Fiber Length (80% min.)	≥ 6.0 in	≥ 15.2 cm
Log Dimensions (W x L) (± 10 %)	6 in x 25 ft 9 in x 25 ft 12 in x 10.0 ft 20 in x 10.0 ft	0.1520 m x 7.620 m 0.2290 m x 7.620 m 0.3048 m x 3.048 m 0.5080 m x 3.048 m

[d] Weight and density are based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

2.02 Stakes

A. Stakes shall be wooden, 1 1/8 in wide x 1 1/8 in thick by a minimum of 30 in long for 6 in, 9 in, and 12 in Curlex Sediment Logs and 48 in long for 20 in Curlex Sediment Logs.

B. 6 inch and 9 inch Curlex Sediment Logs may also be anchored with E-Staples®, 1 in x 6 in, U-shaped, 11 gauge wire staples, 2 in x 8 in, U-shaped, 8 gauge wire staples. Anchoring with staples shall not be used in channelized flow applications. Stakes may be used in conjunction with staples for additional anchoring of 6 inch and 9 inch Curlex Sediment Logs, as deemed necessary by the Engineer.

SECTION 3: EXECUTION

3.01 Sediment Log Supplier Representation

A. Contractor shall coordinate with the log supplier for a qualified representative to be present on the job site at the start of installation to provide technical assistance as needed. Contractor shall remain solely responsible for the quality of installation.

3.02 Site Preparation

A. Before placing sediment logs, the Contractor shall certify that the subgrade has been properly compacted, graded smooth, has no depressions, voids, soft or uncompacted areas, is free from obstructions such as tree roots, protruding stones or other foreign matter, and is seeded and fertilized according to project specifications where applicable. The Contractor shall not proceed until all unsatisfactory conditions have been remedied. By beginning construction, Contractor signifies that the preceding work is in conformance with this specification.

B. Contractor shall fine grade the subgrade by hand dressing where necessary to remove local deviations.

C. No vehicular traffic shall be permitted directly on the sediment log.

3.03 Installation

A. Sediment log shall be installed as directed by the owner's representative in accordance to manufacturer's Installation Guidelines, Staking Pattern Guide, and CAD details. The extent of sediment logs shall be as shown on the project drawings.

B. Sediment log should be installed to intercept water flow and collect sediment on site. They may be placed over bare soil or on top of erosion control blankets. Sediment logs are typically installed laying on flat ground and not trenched.

C. They shall be secured to the subgrade by wood stakes every two lineal feet across the length of the sediment log. The stakes shall be intertwined with the outer mesh of the sediment log only and driven into the ground a minimum of 16 inches on the downstream side of the sediment log.

D. 6 inch and 9 inch Curlex Sediment Logs can also be installed to the subgrade with E-Staples or wire staples. Staples shall be installed every two lineal feet across the length on each side of the sediment log. The two rows of staples shall be staggered by one foot along the length of the sediment log. All staples shall be fully inserted into the subgrade below the sediment log.

E. Sediment log installed in a swale or channel bottom shall allow the installation to continue up the slopes three feet above the anticipated high water mark and perpendicular to the flow of water.

F. Spacing of sediment logs shall be such that the elevation of the bottom of the sediment log upstream will be equal to the elevation of the top of the log downstream.

G. Sediment log shall remain in place until fully established vegetation and root systems are present.

SECTION 4: MAINTENANCE

A. Sediment log shall not be defective or damaged. Damaged or defective materials shall be replaced at no additional cost to the owner.

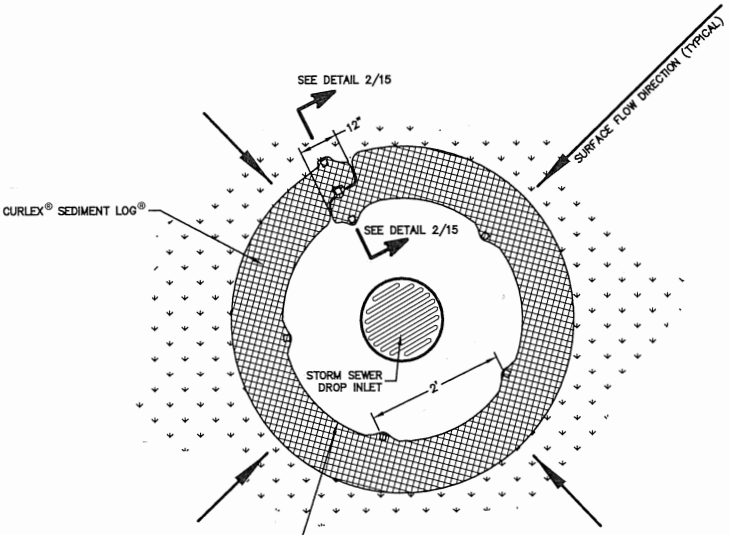
B. The Contractor shall maintain the sediment log in a functional condition at all times and it shall be routinely inspected.

C. If the sediment log has been damaged, it shall be repaired, or replaced if beyond repair.

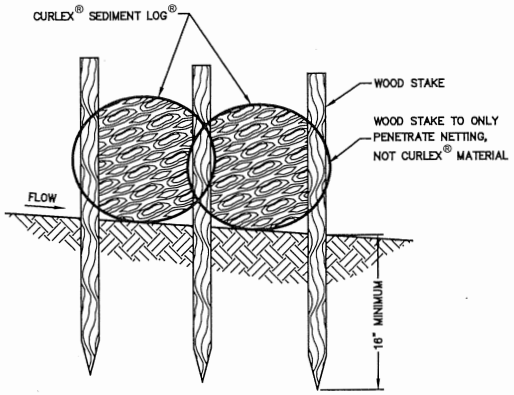
D. The Contractor shall remove sediment at the base of the upslope side of the sediment log when accumulation has reached 1/2 of the effective height of the sediment log or as directed by the Engineer.

E. Sediment log shall be maintained until disturbed area above or around the device has been permanently stabilized and construction activity has ceased.

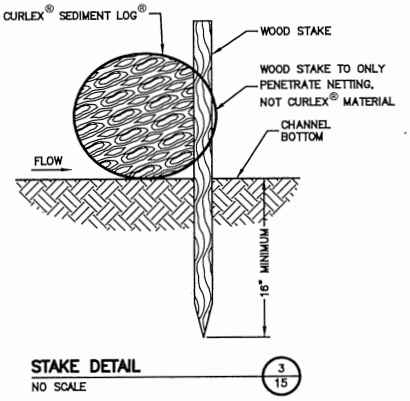
F. At the completion of this scope of work, Contractor shall remove from the job site and properlydispose of all remaining debris, waste materials, excess materials, and equipment required of or created by Contractor. Disposal of waste materials shall be solely the responsibility of Contractor and shall be done in accordance with applicable waste disposal regulations.



CURLEX® SEDIMENT LOG®
DROP INLET PROTECTION
NO SCALE (1/15)



STAKE DETAIL
NO SCALE (2/15)



STAKE DETAIL
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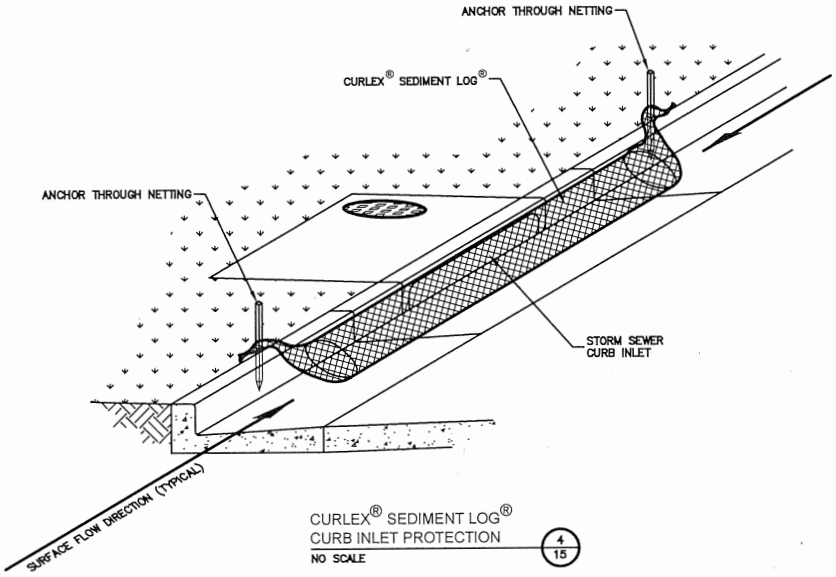
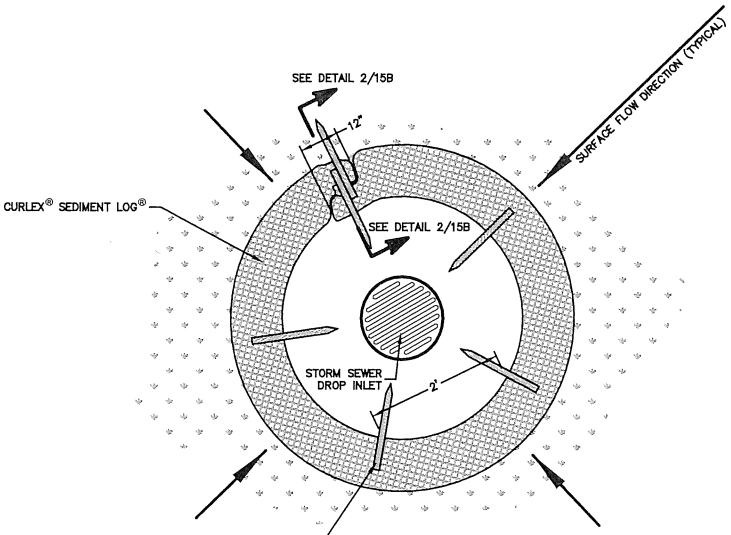


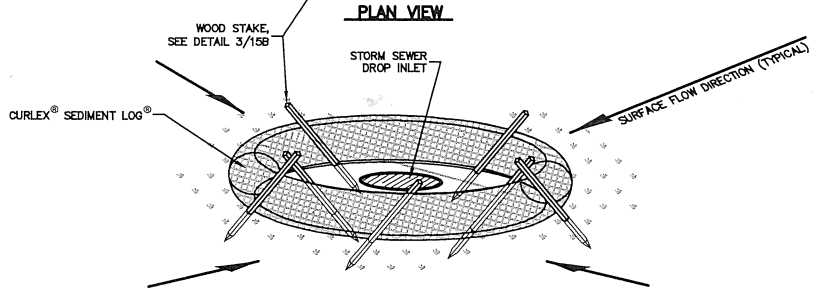
CURLEX® SEDIMENT LOG®
CURB INLET PROTECTION
NO SCALE (4/15)

American Excelsior Company®
Earth Science Division

AMERICAN EXCELSIOR COMPANY ARLINGTON, TEXAS	SHEET DESCRIPTION: CURLEX® SEDIMENT LOG® INLET PROTECTION DETAILS	DATE 3/27/17	DRAWN BY	
		SCALE: NONE	PROJECT NO.	SHEET NO. 15



PLAN VIEW



CURLEX® SEDIMENT LOG®
DROP INLET PROTECTION
NO SCALE
1
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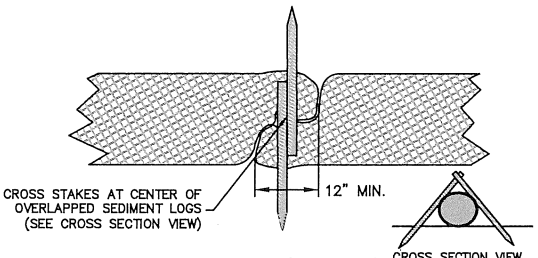

ANCHOR DETAIL (PLAN VIEW)
OVERLAPPING JOINT
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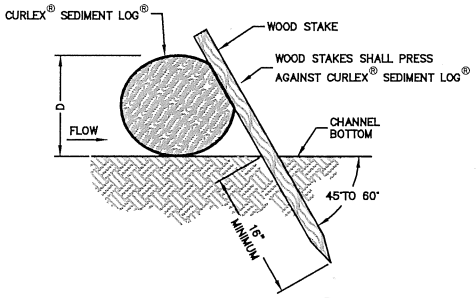

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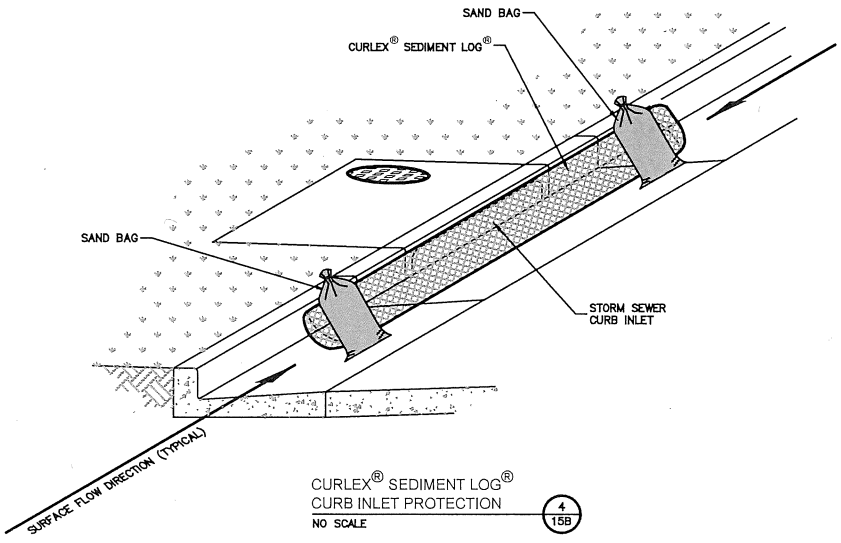

CURLEX® SEDIMENT LOG®
CURB INLET PROTECTION
NO SCALE
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15B

American Excelsior Company®
Earth Science Division

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Curlex® Sediment Logs®

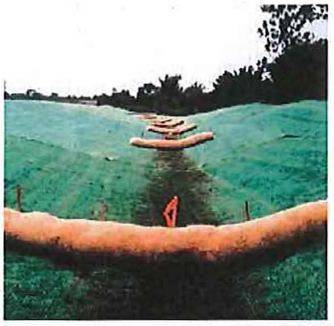
Excelsior Sediment Control Device

Product Description

Curlex Sediment Logs use excelsior fibers to reduce hydraulic energy & filter sediment-laden runoff. Tired of straw and hay bale checks being blown out and the fibers washed downstream to clog the nearest outlet? Fed up with spending all of your time and effort installing silt fence only to see it get knocked down when it rains or a good wind comes along? How about when you have to go back and pick up the loose fibers and/or remove those worn out silt fences and take them to the landfill? Next time, consider giving our Bioengineered Sediment Logs a try. Water filters through (not underneath) the diameter of the porous, interlocked fiber log matrix. As it does, velocity is naturally reduced and sediment is collected on the upstream side of the excelsior fiber log. Install Curl ex Sediment Logs over bare soil, over rolled erosion control products, on steep slopes, around inlets and outlets, or around jobsites for perimeter control.

Material Characteristics

Sediment Logs are versatile excelsior logs comprised of an outside containment fabric that is filled with unique Curlex fibers. Curlex fibers are made of Great Lakes Aspen excelsior fibers. The fibers are curled with soft interlocking barbs and 80% will be six inches in length or longer. The outside, open weave containment fabric is degradable, thus Sediment Logs will degrade in place if not removed. Sediment Logs are porous, allowing water to pass through the excelsior matrix, progressively slowing velocity and filtering sediment as it passes through the log diameter. Sediment Logs are extremely flexible and contour to the terrain to maintain intimate contact with the subgrade. In addition, they come with five other benefits; lightweight, no trenching, no seeds, no disposal hassle, and they may be reusable depending on the application.



Performance Capabilities

Product Names / Nominal Diameters

Type I - (20 in) energy dissipation in heavy duty concentrated flow areas, slope interruption, inlet protection, perimeter control
Type II - (12 in) energy dissipation in mild to medium concentrated flow areas, slope interruption, inlet protection, perimeter control
Type III - (9 in) energy dissipation in mild concentrated flow areas, slope interruption, inlet protection, perimeter control
Type IV - (6 in) energy dissipation in low concentrated flow areas, slope interruption, inlet protection, perimeter control

Typical Applications

- Ditch bottoms, swales, and waterways
- Over bare soils and/or temporary & turf reinforcement blankets
- Drop structures and let down structures
- 360 degree protection around catch basins & drop inlet structures
- Curb & drainage outlets
- Project ingress & egress termination points
- As wattles on steep slopes
- Site perimeter control
- Use in place of bales, silt fence, reinforced silt fence, and rock checks

American Excelsior Company®
Earth Science Division
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MADE IN THE U.S.A.

American Excelsior Company®
Earth Science Division

Curlex® Sediment Log®

Excelsior Sediment Control Device

SUGGESTED SPECIFICATIONS

General

Sediment Log consists of an outside, open weave, containment fabric filled with Great Lakes Aspen curled excelsior fibers. Its purpose is to provide a flexible, lightweight, porous, sediment control device demonstrating the ability to conform to terrain details, dissipate water velocity, and filter contaminated flows.

Product

Sediment Control Device shall be Curlex Sediment Log, as manufactured by American Excelsior Company. Curlex Sediment Logs shall be made of Great Lakes Aspen Excelsior fibers encased in an outside, open weave containment fabric secured on each end. Fibers shall be curled with soft, interlocking barbs to form a strong, organic filtration matrix. A minimum of 80 percent of the fibers shall be 15 cm (6 in) or greater in length. Fibers shall be evenly distributed throughout the diameter and length of the Sediment Log. Excelsior fibers shall be seed free. Density of sediment logs shall not exceed 2.6 lb/ft^3 to ensure necessary flow rates for filtering. Curlex Sediment Log shall be manufactured in the U.S.A. at company locations where QA/QC is implemented and managed by the manufacturer. Field fabricated products and products made by anyone other than the manufacturer (i.e. distributors, dealers, etc.) shall not be accepted.

	TYPE I*	TYPE II*	TYPE III*	TYPE IV*
Product Name/Nominal Diameter	20 in	12 in	9 in	6 in
Length (±10%)	3.05 m (10 ft)	3.05 m (10 ft)	7.62 m (25 ft)	7.62 m (25 ft)
Weight (±10%)**	13.62 kg (30 lb)	9.02 kg (20 lb)	11.35 kg (25 lb)	5.45 kg (12 lb)
Net opening (hexagonal-shaped)	3.2 cm (1.3 in)	2.5 cm (1 in)	1.9 cm (.75 in)	1.3 cm (.5 in)

*Custom sizes available

**Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen Excelsior is 22%.

Performance Requirements

Slope Erosion*:	Reduce by a minimum of 70% of bare soil slopes
Channel Erosion**:	Reduce by a minimum of 50% of bare soil channels
pH Absorption***:	Ending pH shall not exceed 8.3
Functional Longevity****:	⩽ 24 months
Oil Sorbent Material:	U.S. E.P.A. documentation for preapproval

*Based on large-scale rainfall testing as outlined in Kelsey, K., T. Johnson, and R. Vavra. 2006. "Needed Information: Testing, Analyses, and Performance Values for Slope Interruption and Perimeter Control BMPs." IECA Conference Proceedings. P. 171-181.

**Based on ASTM D7208

***Based on ASTM D1117, modified

****Functional Longevity varies from region to region because of differences in climatic conditions.

Curlex Sediment Logs Design Values With Comparisons To Typical Straw Wattles

	Channel Design			Slope Design	
Product Name/ Nominal Diameter	Density* (lb/ft3)	GPM/ft2**	GPM/linear ft of installed product	P Factor*** (event-based)	% Soil Retained
6" Curlex Sediment Log	2.4	42.5	19.5	0.461	53.9
9" Straw Wattle	4.5	7.5	5.6	0.676	32.4
9" Curlex Sediment Log	2.3	42.5	29.0	0.461	53.9
12" Straw Wattle	3.8	8.0	8.0	0.828	17.2
12" Curlex Sediment Log	2.5	40.0	36.7	0.297	70.3
20" Curlex Sediment Log	1.4	37.5	46.9	0.297	70.3

*Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior, AEC Premier Straw, and AEC Premier Coconut fibers are 22%, 15%, and 20%, respectively.

**Based on ASTM D5141.

***Based on large-scale simulated rainfall testing.

MADE IN THE U.S.A.

If you would like to receive more information or consult with one of our Customer Care Center Specialists, please call us toll free at (888-352-9582)

PDF download specifications available in the Technical Support Library at www.curlex.com

Special Specification

Erosion Eels™

1. Description. Furnish, install, maintain, and remove Erosion Eels™ as shown on plans or as directed.

2. Materials.

1. **Core Material.** Erosion Eels™ shall consist of core, internal filter materials comprised of one of two mixtures:

   I. **Mixture Specification 1.0.** A filter mixture comprised of 100% shredded rubber that has been washed and processed to remove most, if not all, metal components. The material shall be derived from recycled tires and shall be shredded to produce a maximum particle size of +/- ¾ inch.
   II. **Mixture Specification 2.0.** A filter mixture comprised of 100% shredded rubber that has been washed and processed to remove most, if not all, metal components. The material shall be derived from recycled tires and shall be shredded to produce a maximum particle size of +/-2-inches.

2. **Containment Material.** The containment material for the filter core particles shall be a woven, polypropylene geotextile with UV-stabilizers and inert to biological decay and chemically resistant to naturally occurring chemicals, alkalis, and acids. Minimum fabric permeability shall be equal to or greater than 0.05 cm/sec per ASTM D 4491. Minimum strength retained relative to UV exposure shall be 70% when tested per ASTM D 4355 for 500 hours.

3. **Size.** Erosion Eels™ shall be produced with a nominal diameter of +/-9.5 inches and +/-20 inches and standard nominal lengths of +/-4.5 feet and +/-10 feet.

3. Construction. Install Erosion Eels™ near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the Erosion Eels™ into the erosion control measures used to the control sediment on construction sites. Install, align, and locate the Erosion Eels™ as specified below, as shown on the plans, as direction.

A. **Stabilizing/Securing.** Secure Erosion Eels™ in a method adequate to prevent displacement as a result of normal rain events and such that flow is not allowed under the bags.
B. **Maintenance.** Inspect and maintain the Erosion Eels™ in good condition. Maintain the integrity of the control, including keeping the bags free of accumulated silt, debris, etc., until permanent erosion control features are in place, or the disturbed area has been adequately stabilized. Stabilize the areas damaged by the removal process using appropriate methods as approved. Repair or replace damaged Erosion Eels™ as required and as directed. Temporarily remove and replace Erosion Eels™ as required to facilitate work. Remove sediment and debris when accumulation affects the

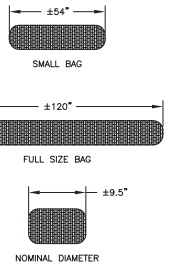
performance of the devices, after a rain, and when directed. Dispose of sediment and debris at an approved site in a manner that will not contribute to additional siltation.

C. Removal. Remove and reuse Erosion Eels™ when directed.

4. Measurement. This item will be measured by the linear foot along the centerline of the top of the control bags.

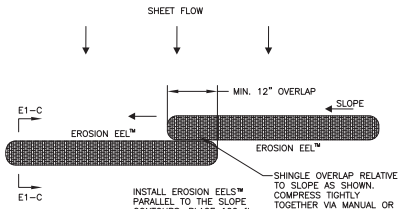
End-of Section

Note: Specifications are subject to revisions at the discretion of the Manufacturer.

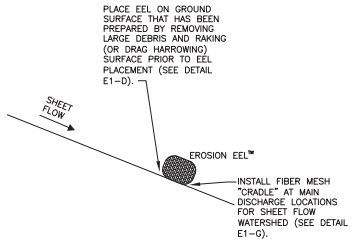


NOTE:
ALL EROSION EELS™ USED FOR PERIMETER CONTROL SHALL USE MIXTURE SPECIFICATIONS 1.1 AND 1.2.

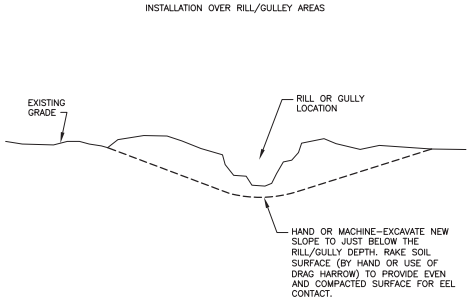
DETAIL E1–A: EROSION EELs™
N.T.S.



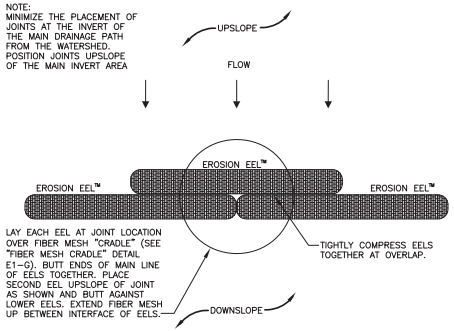
DETAIL E1–B: INTERCEPTING SHEET FLOW
PERPENDICULAR TO FLOW PATH – PLAN VIEW



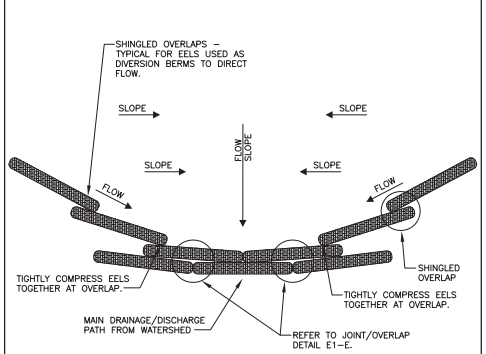
DETAIL E1–C: INTERCEPTING SHEET FLOW
PERPENDICULAR TO FLOW PATH – PLAN VIEW



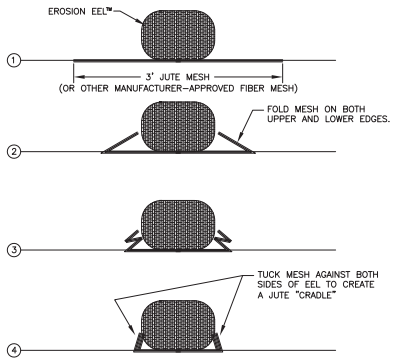
DETAIL E1–D: CROSS–SECTION VIEW
N.T.S.



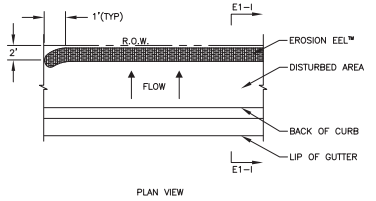
DETAIL E1–E: PLAN VIEW –
OVERLAP/JOINT DETAIL NEAR DISCHARGE POINTS FROM WATERSHED
N.T.S.



DETAIL E1–F: PLAN VIEW – TYPICAL
ARRANGEMENT OF EELS USED FOR PERIMETER CONTROL
N.T.S.

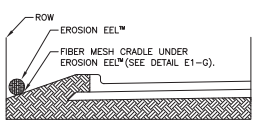


DETAIL E1–G: SECTION – FIBER MESH "CRADLE"
N.T.S.

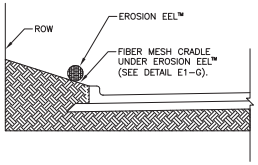


PLAN VIEW

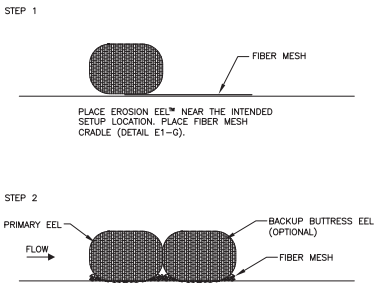
DETAIL E1–H: EROSION EEL™
PLACED AT EDGE OF ROADWAY RIGHT–OF–WAY
N.T.S.



DETAIL E1–I: SECTION
N.T.S.



DETAIL E1–J: SECTION
N.T.S.



DETAIL E1–K: STABILIZING PROCEDURE FOR
EROSION EEL PLACED OVER HARD SURFACE (PAVED, ROCK, ETC.)
N.T.S.

Spacing Recommendations for the Erosion Eel™ for Perimeter Controls and Intercepting Sheet Flow on Slopes

slope(%)	single eel spacing (ft)	*Stacked Dual eel spacing (ft)
0.5	300	N/A
1	200	N/A
2	160	N/A
3	80	N/A
4	50	N/A
5	40	N/A
6	35	N/A
8	30	N/A
10	25	N/A
15	17	N/A
20	12	25
25	7	15
33	N/A	10
50	N/A	6

* DUAL STACK REFERS TO TWO EELS STACKED ATOP ONE ANOTHER AND STABILIZED WITH T–POSTS. SEE DETAIL E2–E ON SHEET E–2.

GENERAL NOTES:

1. EROSION EELS™ USED IN PERIMETER CONTROL APPLICATIONS SHALL HAVE A SPECIFICATION MIXTURE 1.1 OR 1.2.
   a. MIXTURE SPECIFICATION 1.1. A FILTER MIXTURE COMPRISED OF 50% SHREDDED RUBBER AND 50% WOOD CHIP PARTICLES BY VOLUME. THE SHREDDED RUBBER SHALL BE WASHED AND PROCESSED TO REMOVE MOST, IF NOT ALL, METAL COMPONENTS. THE RUBBER SHALL BE DERIVED FROM RECYCLED TIRES AND SHALL BE SHREDDED TO PRODUCE A MAXIMUM PARTICLE SIZE OF +/– 3/4 INCH. THE WOOD CHIPS SHALL BE PRODUCED FROM HARDWOOD TREES AND SHALL CONFIRM TO AASHTO CERTIFICATION SPECIFICATION MP 9–03.
   b. MIXTURE SPECIFICATION 1.2. A FILTER MIXTURE COMPRISED OF 1/3 SHREDDED RUBBER, 1/3 WOOD CHIPS, AND 1/3 RECYCLED SYNTHETIC FIBERS. THE SHREDDED RUBBER SHALL BE WASHED AND PROCESSED TO REMOVE MOST, IF NOT ALL, METAL COMPONENTS. THE RUBBER SHALL BE DERIVED FROM RECYCLED TIRES AND SHALL BE SHREDDED TO PRODUCE A MAXIMUM PARTICLE SIZE OF +/– 3/4 INCH. THE WOOD CHIPS SHALL BE PRODUCED FROM HARDWOOD TREES AND SHALL CONFIRM TO AASHTO CERTIFICATION SPECIFICATION MP 9–03. THE SYNTHETIC FIBERS SHALL BE PRODUCED FROM RECYCLED, MANUFACTURED MATERIALS, SUCH AS, BUT NOT LIMITED TO, PRE–CONSUMER SCRAP CARPET, TIRE CHORD, AND TIRE FIBER MATERIALS.
2. EROSION EELS™ SHALL BE MANUFACTURED FROM A WOVEN GEOTEXTILE COVERING WITH INTERIOR FILTER MATERIALS SUCH AS 100% SHREDDED RUBBER (MIXTURE SPECIFICATION 1.0, 50% SHREDDED RUBBER/50% AASHTO–CERTIFIED WOOD CHIPS (MIXTURE SPECIFICATION 1.1), OR 1/3 SHREDDED RUBBER:1/3 AASHTO–CERTIFIED WOOD CHIPS:1/3 RECYCLED SYNTHETIC FIBERS (MIXTURE SPECIFICATION 1.2).
3. LENGTHS OF EROSION EELS™ SHALL BE EITHER A NOMINAL +/–10 FT. OR +/– 4.5 FT. NOMINAL DIAMETER SHALL BE +/–9.5 INCHES.
4. EROSION EELS™ CAN BE PLACED AT THE TOP, ON THE FACE, OR AT THE TOE OF SLOPES TO INTERCEPT RUNOFF, REDUCE FLOW VELOCITY, RELEASE THE RUNOFF AS SHEET FLOW AND PROVIDE REMOVAL OF SEDIMENT FROM THE RUNOFF.
5. EROSION EELS™ SHALL BE INSTALLED ALONG THE GROUND CONTOUR, AT THE TOE OF SLOPES, AT AN ANGLE TO THE CONTOUR TO DIRECT FLOW AS A DIVERSION BERM, AROUND INLET STRUCTURES, IN A DITCH AS A CHECK DAM TO HELP REDUCE SUSPENDED SOLIDS LOADING AND RETAIN SEDIMENT, OR AS A GENERAL FILTER FOR ANY DISTURBED SOIL AREA.
6. NO TRENCHING IS REQUIRED FOR INSTALLATION OF EROSION EELS™
7. PREPARE BED FOR EEL INSTALLATION BY REMOVING ANY LARGE DEBRIS INCLUDING ROCKS, SOIL CLODS, AND WOODY VEGETATION. EROSION EELS™ CAN ALSO BE PLACED OVER PAVED SURFACES INCLUDING CONCRETE AND ASPHALT WITH NO SURFACE PREPARATION REQUIRED.
8. RAKE BED AREA WITH A HAND RAKE OR BY DRAG HARROW.
9. DO NOT PLACE EEL DIRECTLY OVER RILL AND GULLIES UNTIL AREA HAS BEEN HAND–EXCAVATED AND RAKED TO PROVIDE A LEVEL BEDDING SURFACE. ALL SURFACES SHALL BE UNIFORMLY COMPACTED FOR MAXIMUM SEATING OF EELS IN PLACE.
10. FOR LOCATIONS WHERE EELS WILL BE PLACED IN CONCENTRATED FLOWS (SUCH AS CHECK DAMS, INLET PROTECTION) AND FOR PERIMETER CONTROLS AT PRIMARY DISCHARGE LOCATIONS, BED THE EELS IN A JUTE MESH CRADLE PER THE DETAILED DRAWINGS.
11. FOR DITCH APPLICATIONS, THE MAXIMUM DRAINAGE AREA SHALL BE 10 ACRES.
12. IF MORE THAN ONE EROSION EEL™ IS PLACED IN A ROW, THE EELS SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES TO PREVENT FLOW AND SEDIMENT FROM PASSING THROUGH THE FIELD JOINT. COMPRESS THE TWO EELS OF THE OVERLAP TIGHTLY TOGETHER EITHER BY HAND OR MANUFACTURER–APPROVED MECHANIZED MEANS.
13. WHEN USED IN DITCHES AS A CHECK DAM, EROSION EELS™ SHALL BE INSTALLED PER MANUFACTURER'S DETAILS.
14. FOR CHECK DAM APPLICATIONS, EROSION EELS™ SHALL BE PLACED PERPENDICULAR TO THE FLOW OF THE WATER. EROSION EELS™ SHALL CONTINUE UP THE SIDES SLOPES A MINIMUM OF 3 FEET ABOVE THE DESIGN FLOW DEPTH.
15. EROSION EELS™ SHALL REMAIN IN PLACE UNTIL FULLY ESTABLISHED VEGETATION HAS COMPLETELY DEVELOPED OR UNTIL THE STORAGE CAPACITY/FUNCTIONAL LIFE OF THE EEL HAS BEEN EXHAUSTED (REQUIRING REPLACEMENT WITH NEW EELS).
16. ANCHORING POSTS FOR CHECK DAM APPLICATIONS SHALL HAVE A MINIMUM WEIGHT OF 1.25 LBS/FT STEEL T–POSTS (5 TO 7 FT. LENGTHS) ROLLED FROM HIGH CARBON STEEL. POSTS SHOULD BE HOT–DIP GALVANIZED OR COATED WITH A WEATHER–RESISTANT PAINT FOR STEEL APPLICATION. POSTS SHOULD BE EQUIPPED WITH A METAL ANCHOR PLATE. INSTALL PER DETAILS ON THIS SHEET.
17. PLACE T–POSTS THROUGH HANDLE OF BAGS. DO NOT DRIVE POSTS THROUGH EROSION EELS™. T–POSTS ARE TO BE EMBEDDED A MINIMUM OF 2 FT INTO GROUND.

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
1		
2		
3		
4		
5		

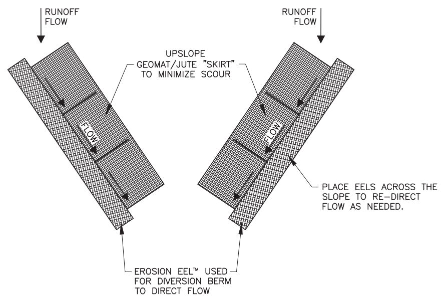
Authorized Use:
☐ Survey ☐ Design Dev. ☐ Permitting ☐ Bidding ☐ Construction ☐ -

ErosionEels.com 866-429-EELS 866-429-3357

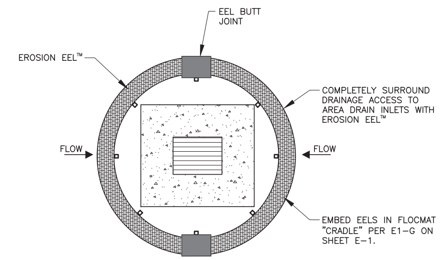
FRIENDLY ENVIRONMENT
100 PRINCE STREET
SHELBYVILLE, TENNESSEE 37160
1–931–607–5953

PERIMETER CONTROL AND SHEET (INTER-RILL) FLOW INTERCEPTION FOR THE EROSION EEL™

SHEET OF
DWG NO: E-1
LAST EDIT DATE: JUNE 7, 2007 DRAWN BY: MJ
DWG SCALE: N.T.S. CHECKED BY: KW
PROJECT NO:
DRAFT MANAGER APPROVAL: KW

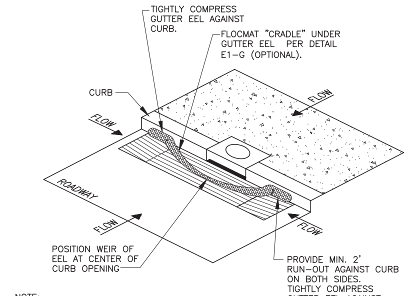


DETAIL E3-A: PLAN VIEW –
EELS USED AS DIVERSION BERMS
N.T.S.



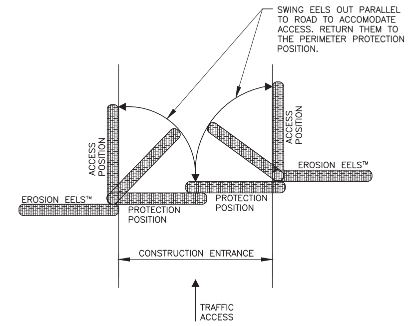
NOTE:
PERIODIC MAINTINENCE SHALL INCLUDE CLEANING EEL SURFACE WITH HIGH PRESSURE WASH OR BRUSHING SURFACE WITH BROOM.

DETAIL E3-B: INLET SEDIMENT TRAP
N.T.S.

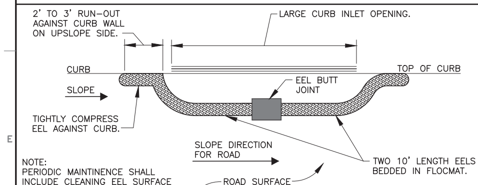


NOTE:
PERIODIC MAINTINENCE SHALL INCLUDE CLEANING GUTTER EEL SURFACE WITH HIGH PRESSURE WASH OR BRUSHING SURFACE WITH BROOM.

ISOMETRIC DETAIL E3-C: SMALL CURB INLET SEDIMENT TRAP – GUTTER EEL
N.T.S.

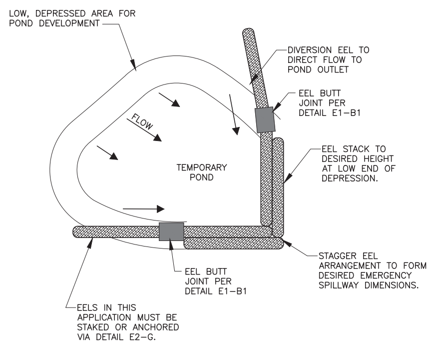


DETAIL E3-D: PLAN VIEW –
TEMPORARY CONSTRUCTION ACCESS
N.T.S.

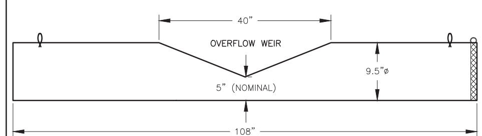


NOTE:
PERIODIC MAINTINENCE SHALL INCLUDE CLEANING EEL SURFACE WITH HIGH PRESSURE WASH OR BRUSHING SURFACE WITH BROOM.

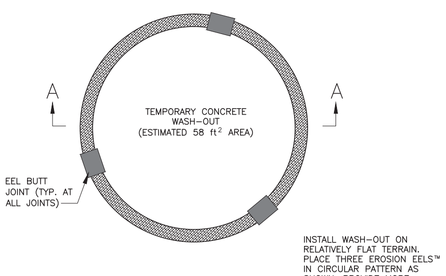
DETAIL E3-E: PLAN VIEW – LARGE CURB INLET (GUTTER EEL)
N.T.S.



DETAIL E3-F: PLAN VIEW –
TEMPORARY DETENTION POND
N.T.S.

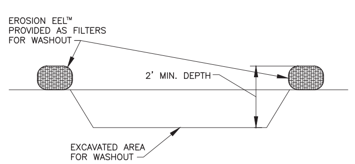


GUTTER EEL
N.T.S.

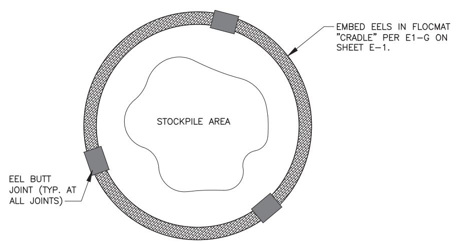


INSTALL WASH-OUT ON RELATIVELY FLAT TERRAIN. PLACE THREE EROSION EELS™ IN CIRCULAR PATTERN AS SHOWN. PROVIDE MORE EELS TO BROADEN CIRCUMFERENCE FOR LARGER WASHOUTS, IF DESIRED.

DETAIL E3-G: PLAN VIEW –
TEMPORARY CONCRETE WASH-OUT
N.T.S.

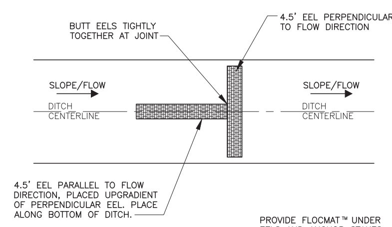


SECTION A FOR DETAIL E3-H: TEMPORARY CONCRETE WASHOUT
N.T.S.



INSTALL STOCKPILE ON RELATIVELY FLAT TERRAIN. PLACE THREE EROSION EELS™ IN CIRCULAR PATTERN AS SHOWN. PROVIDE MORE EELS TO BROADEN CIRCUMFERENCE FOR LARGER STOCKPILES, IF DESIRED.

DETAIL E3-I: PLAN VIEW –
TEMPORARY STOCKPILE AREAS
N.T.S.



PROVIDE FLOCMAT™ UNDER EELS AND ANCHOR STAKES BEHIND PERPENDICULAR EEL PER INSTALLATION DRAWINGS.

DETAIL E3-J: PLAN VIEW –
"CROSS-CHECK" DAM ARRANGEMENT
FOR SMALL V-DITCH APPLICATIONS
N.T.S.

GENERAL NOTES

1. EROSION EELS™ SHALL BE MANUFACTURED FROM A WOVEN GEOTEXTILE COVERING WITH INTERIOR FILTER MATERIALS.
2. LENGTHS OF EROSION EELS™ SHALL BE EITHER A NOMINAL +/−10 FT. OR +/− 4.5 FT. NOMINAL DIAMETER SHALL BE +/−9.5 INCHES OR +/− 20 INCHES.
3. EROSION EELS™ CAN BE PLACED AT THE TOP, ON THE FACE, OR AT THE TOE OF SLOPES TO INTERCEPT RUNOFF, REDUCE FLOW VELOCITY, RELEASE THE RUNOFF AS SHEET FLOW AND PROVIDE REMOVAL OF SEDIMENT FROM THE RUNOFF.
4. EROSION EELS™ SHALL BE INSTALLED ALONG THE GROUND CONTOUR, AT THE TOE OF SLOPES, AT AN ANGLE TO THE CONTOUR TO DIRECT FLOW AS A DIVERSION BERM, AROUND INLET STRUCTURES, IN A DITCH AS A CHECK DAM TO HELP REDUCE SUSPENDED SOLIDS LOADING AND RETAIN SEDIMENT, OR AS A GENERAL FILTER FOR ANY DISTURBED SOIL AREA.
5. NO TRENCHING IS REQUIRED FOR INSTALLATION OF EROSION EELS™.
6. PREPARE BED FOR EEL INSTALLATION BY REMOVING ANY LARGE DEBRIS INCLUDING ROCKS, SOIL CLODS, AND WOODY VEGETATION. EROSION ELLS™ CAN ALSO BE PLACED OVER PAVED SURFACES INCLUDING CONCRETE AND ASPHALT WITH NO SURFACE PREPARATION REQUIRED.
7. RAKE BED AREA WITH A HAND RAKE OR BY DRAG HARROW.
8. DO NOT PLACE EEL DIRECTLY OVER RILL AND GULLIES UNTIL AREA HAS BEEN HAND-EXCAVATED AND RAKED TO PROVIDE A LEVEL BEDDING SURFACE. ALL SURFACES SHALL BE UNIFORMLY COMPACTED FOR MAXIMUM SEATING OF EELS IN PLACE.
9. FOR LOCATIONS WHERE EELS WILL BE PLACED IN CONCENTRATED FLOWS (SUCH AS CHECK DAMS, INLET PROTECTION) AND FOR PERIMETER CONTROLS AT PRIMARY DISCHARGE LOCATIONS, BED THE EELS IN A JUTE MESH CRADLE PER THE DETAILED DRAWINGS.
10. IF MORE THAN ONE EROSION EEL™ IS PLACED IN A ROW, THE EELS SHALL BE JOINED PER DETAIL E1-B1.
11. FOR CHECK DAM APPLICATIONS, EROSION EELS™ SHALL BE PLACED PERPENDICULAR TO THE FLOW OF THE WATER. EROSION EELS™ SHALL CONTINUE UP THE SIDES SLOPES A MINIMUM OF 3 FEET ABOVE THE DESIGN FLOW DEPTH.
12. EROSION EELS™ SHALL REMAIN IN PLACE UNTIL FULLY ESTABLISHED VEGETATION HAS COMPLETELY DEVELOPED OR UNTIL THE STORAGE CAPACITY/FUNCTIONAL LIFE OF THE EEL HAS BEEN EXHAUSTED (REQUIRING REPLACEMENT WITH NEW EELS).
13. ANCHORING POSTS FOR CHECK DAM APPLICATIONS SHALL HAVE A MINIMUM WEIGHT OF 1.25 LBS/FT STEEL T-POSTS (5 TO 7 FT. LENGTHS) ROLLED FROM HIGH CARBON STEEL. POSTS SHOULD BE HOT-DIP GALVANIZED OR COATED WITH A WEATHER-RESISTANT PAINT FOR STEEL APPLICATION. POSTS SHOULD BE EQUIPPED WITH A METAL ANCHOR PLATE. INSTALL PER DETAILS ON THIS SHEET.
14. PLACE T-POSTS BEHIND EELS. DO NOT DRIVE POSTS THROUGH EROSION EELS™. T-POSTS ARE TO BE EMBEDDED A MINIMUM OF 2FT. TO 3 FT. INTO GROUND.

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION

Authorized Use:
- ☐ Survey
- ☐ Design Dev.
- ☐ Permitting
- ☐ Bidding
- ☐ Construction
- ☐ .

FRIENDLY ENVIRONMENT
100 PRINCE STREET
SHELBYVILLE, TENNESSEE 37160
1-931-607-5953

CHECK DAMS (CONTINUED), DIVERSION BERM, INLET PROTECTION, PONDS, AND CONCRETE WASHOUT DETAILS FOR THE EROSION EEL™

NOTE: DRAWINGS SUBJECT TO REVISIONS AT DISCRETION OF MANUFACTURER

LAST EDIT DATE:	June 03, 2013	DRAWN BY:	LM
DWG SCALE:	N.T.S.	CHECKED BY:	KW
PROJECT NO:	060-925		
QUALITY MANAGER APPROVAL:			

SHEET OF
DWG NO.: E-3

Filtrexx® Sediment/Perimeter Control (SiltSoxx™)

SECTION 1: PURPOSE & DESCRIPTION

Filtrexx® SiltSoxx™ is a three-dimensional tubular sediment control and stormwater runoff filtration device typically used for **Sediment/Perimeter Control** of sediment and soluble pollutants (such as phosphorus and petroleum hydrocarbons), on and around construction activities. Perimeter control traps sediment and soluble pollutants by *filtering* runoff water as it passes through the matrix of the Soxx™ *and* by allowing water to temporarily pond behind the Soxx, allowing *deposition* of suspended solids. Perimeter control is also used to reduce runoff flow velocities on sloped surfaces.

SECTION 2: MATERIAL & APPLICATION

Perimeter control is to be installed down slope of any disturbed area requiring erosion and sediment control and filtration of soluble pollutants from runoff. Perimeter control is effective when installed perpendicular to sheet or low concentrated flow, and in areas that silt fence is normally considered appropriate. Acceptable applications include:

- Site perimeters
- Above and below disturbed areas subject to sheet runoff, interrill and rill erosion
- Above and below exposed and erodable slopes
- Along the toe of stream and channel banks
- Around area drains or inlets located in a 'sump'
- On compacted soils where trenching of silt fence is difficult or impossible
- Around sensitive trees where trenching of silt fence is not beneficial for tree survival or may unnecessarily disturb established vegetation
- On frozen ground where trenching of silt fence is impossible
- On paved surfaces where trenching of silt fence is impossible

Perimeter control can be applied to areas of high sheet runoff and erosion, on slopes up to a 1:1 grade (should be used in conjunction with slope stabilization/erosion control technology on slopes

Installation Method – Perimeter Control

> 4:1), around inlets, and in other disturbed areas of construction sites requiring sediment control. Perimeter control may also be used in sensitive environmental areas, where migration of wildlife may be impeded by the use of fences or trenching may damage roots.

It is possible to drive over perimeter control during construction (although not recommended), however, these areas should be immediately repaired by manually moving perimeter control back into place, if disturbed. Continued heavy construction traffic may destroy the fabric mesh, reduce the dimensions, and reduce the effectiveness of the perimeter control.

ADVANTAGES AND DISADVANTAGES

Advantages

- Tubular filtration matrix allows for better trapping and removal of sediment and soluble pollutants in stormwater runoff compared to planar constructed sediment control devices (i.e., silt fence).
- Greater surface area contact with soil than typical sediment control devices reduces potential for runoff to create rills under the device leading to unfiltered sediment.
- No trenching is required; therefore soil is not disturbed upon installation or removal.
- Perimeter control can be installed year-round in

difficult soil conditions such as frozen or wet ground, and dense and compacted soils, as long as stakes can be driven.
- Perimeter control is easily implemented as a treatment in a greater treatment train approach to erosion and sediment control.
- Organic matter and humus colloids in FilterMedia™ (filler material in perimeter control) have the ability to bind and adsorb phosphorus, metals, and hydrocarbons that may be in stormwater runoff.
- Microorganisms in FilterMedia have the ability to degrade organic pollutants and cycle captured nutrients in stormwater runoff.
- Soxx (the mesh netting containment system) allows perimeter control to be placed in areas of high sheet flow and low concentrated flow.
- Perimeter control can be direct seeded at time of application to provide greater stability and filtration capability once vegetation is established.
- FilterMedia is organic and can be left on site after permanent stabilization is complete, to be used in landscape design and/or seeded and planted with permanent vegetation.
- FilterMedia improves existing soil structure if spread out and used as a soil amendment after construction activity is complete.
- Biodegradable or photodegradable perimeter control can be left on site after construction activity and may eliminate the need for removal and labor and disposal costs.
- Perimeter control can be used on slopes to slow down runoff velocity, disperse concentrated runoff, and reduce effective slope lengths, reducing the erosive potential of stormwater runoff.
- Perimeter control is less likely to obstruct wildlife movement and migration than planar/silt fence sediment control practices.
- Perimeter control is available in 5 in. (125mm), 8 in.(200mm), 12 in. (300mm), 18 in. (450mm), 24 in. (600mm), and 32 in (800mm) diameters for customized applications and challenging situations.
- Perimeter control is available in up to 200 ft (61m) continuous lengths to prevent weak sections and creation of concentrated flow situations typical to low points in runs of other sediment control devices. End points are sleeved together to form continuous runs of unlimited lengths without low or break points.
- Perimeter control may assist in qualification for LEED® Green Building Rating and Certification credits under LEED Building Design & Construction (BD+C), New Construction v4. Awarded credits may be possible from the categories of Sustainable Sites, Water Efficiency, Materials & Resources, and Innovation. *Note: LEED is an independent program offered through the U.S. Green Building Council. LEED credits are determined on a per project basis by an independent auditing committee. Filtrexx neither guarantees nor assures LEED credits from the use of its products. LEED is a trademark of the U.S. Green Building Council.*

ADVANTAGES			
	LOW	MED	HIGH
Installation Difficulty	✓		
Durability			✓
Sediment Control			✓
Soluble Pollutant Control		✓	
Runoff Flow Control		✓	
Life Cycle Cost	✓		

Disadvantages
- If filler material of perimeter control is not Filtrexx® Certified℠ FilterMedia™, performance may be diminished.
- If not installed correctly, maintained or used for a purpose or intention that does not meet specifications performance may be diminished.
- If land surface is extremely bumpy, rocky, or changes elevation abruptly ground surface contact to perimeter control may be diminished thereby adversely effecting performance.

MATERIAL SPECIFICATIONS

Perimeter control use only photodegradable or biodegradable Soxx netting materials available from Filtrexx International and are the only mesh materials accepted in creating perimeter control for any purpose. For Soxx tubular mesh material specifications see Table 1.1.

FILTERMEDIA™ CHARACTERISTICS

Specifications for perimeter control use only Filtrexx Certified FilterMedia which is a coarse composted material that is specifically designed for removal of solids and soluble pollutants from stormwater runoff. FilterMedia can be altered or customized to target specific pollutants in runoff as approved by the Engineer or Filtrexx International. All Filtrexx Certified FilterMedia has been third party tested and certified to meet minimum performance criteria defined by Filtrexx International. Performance parameters include; hydraulic flow through rate, total solids removal efficiency, total suspended solids removal efficiency, turbidity reduction, nutrient removal efficiency, metals removal efficiency, and motor oil removal efficiency. For information on the physical and chemical properties of Filtrexx Certified FilterMedia refer to the Filtrexx Design Manual, section 5.1. Look for the Filtrexx Certified FilterMedia Seal from our international network of Filtrexx Certified Installers and Manufacturers.

PERFORMANCE

Performance testing and research on perimeter control has been extensive. Results from testing and research programs conducted on perimeter control include: hydraulic flow through rate, ponding rate and calculation (behind perimeter control), sediment storage capacity (inside + behind tool), total solids removal efficiency, suspended solids removal efficiency (with and w/out biopolymer and polymer flocculants), turbidity reduction (with and w/out biopolymer and polymer flocculants), nitrate-N removal efficiency, total P removal efficiency, soluble reactive P removal efficiency (with and w/out Nutrient Agent), petroleum hydrocarbon (motor oil) removal efficiency, and heavy metals (Cu, Fe, Mn, Zn) removal efficiency. For a summary of performance testing, research results, and design specifications see Table 1.1 and Table 1.2. For copies of full reports visit www.filtrexx.com.

Successful bidders will furnish adequate research support showing their manufactured product meets or exceeds performance and design criteria outlined in this standard specification. Research or performance testing will be accepted if it meets the following criteria: conducted by a neutral third party, utilizes standard test methods reported by ASTM or referenced in a peer reviewed scientific journal, product and control treatments are tested in triplicate, performance results are reported for product and control (control should be a bare soil under the same set of environmental and experimental conditions), results are peer reviewed, results indicate a minimum 60% TSS removal efficiency and a minimum hydraulic flow through rate of 5 gpm/ft^2. Bidders shall attach a copy of the research report indicating test methodologies utilized and results.

Note: the Contractor is responsible for establishing a working erosion and sediment control system and may, with approval of the Engineer, work outside the minimum construction requirements as needed. Where the perimeter control deteriorates or fails, it shall be repaired or replaced with an effective alternative.

SECTION 3: DESIGN CRITERIA

The sediment and pollutant removal process characteristic to perimeter control combines both filtering and deposition from settling solids. This is different than methods that rely on ponding for deposition of solids for perimeter control (i.e., silt fence). Ponding occurs when water flowing to the perimeter control accumulates faster than the hydraulic flow through rate of the perimeter control. Typically, hydraulic flow-through rates for perimeter control are 50% greater than geotextile filter fabric (silt fence). *Greater hydraulic flow-through rates reduce ponding, therefore reducing the need for taller sediment control structural design height.* Additionally, perimeter control does not blind as easily with small soil/sediment colloids, as do planar geotextile sediment control barriers (such as silt fence). However, installation and maintenance is especially important for proper function and performance. For engineering design details see Figure 1.1. For a summary of specifications for product/practice use, performance and design see Table 1.1 and Table 1.2.

Filtering Water

For most standard perimeter control applications, a 12 in (300mm) diameter perimeter control can replace a 24 to 36 in (600 to 900mm) silt fence. See Table 1.3 and 1.4 and Figure 1.2 for standard design specifications for maximum allowable slope lengths. Note: In some low flow conditions, an 8 in (200mm) perimeter control may replace a 24 in (600mm) silt fence. Design consideration should be given to the duration of the project, total area of disturbance, rainfall/runoff potential, soil erosion potential, and sediment loading.

Runoff Flow:
Sheet runoff flow and ponding depth should not exceed the height of the perimeter control. If overflow of the device is a possibility, larger diameter perimeter control should be constructed, other sediment control devices may be used, or management practices to reduce runoff should be installed. Alternatively, a second perimeter control may be constructed or used in combination with compost erosion control blankets or rolled erosion control blankets to slow runoff and reduce erosion. The Filtrexx Design Tool can assist in planning and designing what diameter perimeter control should be used, correct spacing requirements, and what rainfall and site conditions can lead to runoff breaching of the perimeter control. For instructions and a copy of

Figure 1.3 Filtrexx® Sediment Control Design Tool for Sediment Control Applications.

Step 1: Choose units. ft or m		ft				
Step 2: Choose input: Tr or I		Tr				
	total rainfall	inches	1.5	storm duration	hours: 24	
Step 3: Choose input: A or W			W			
	width of area	ft	400.00	length of slope	ft: 250	43560
Step 4: Input slope		%	10			452.588
Step 5: Input reduction runoff percent		%	10			
			sediment control (8,12,16)	silt fence (24, 30)		
Step 6: Input effective length of filter		ft	400	400		
Step 7: Input diameter/height of filter		inches	12	36		

Step 8: Find time to overflow filter and total flow/ft the filter can handle

Step 9: On figure find for given flow expected time to overflow filter

Part A. Evaluation of q_l

I inches/hr	A acres	s percent	Q gpm	L_{ss} ft	q_l gpm/ft
0.063	2.2957	10	58.15	400	0.145

Part B. Predicted time and total flow to top filter.

	q_o gpm/hr	D inches	Effective D inches	Time Overflow hr	Total Flow gal/f	Filter OKAY time > tr
Sediment control (Coarse Material)	0.145	12	9.6	**99.1**	**865**	OKAY
Silt Fence	0.145	36	30.6	**97.5**	**851**	OKAY

Use on Ecologically Sensitive Sites

the Filtrexx Design Tool, refer to the Filtrexx Design Manual, Section 5.4 and 5.4a.

Level Contour:
Perimeter control should be placed on level contours to assist in dissipating low concentrated flow into sheet flow and reducing runoff flow velocity. Do not construct perimeter control to concentrate runoff or channel water. Sheet flow of water should be perpendicular to the perimeter control at impact and relatively un-concentrated. Placing perimeter control on undisturbed soil will reduce the potential for undermining.

Runoff and Sediment Accumulation:
Where possible, perimeter control should be placed at a 5 ft (1.5m) or greater distance away from the toe of the slope to allow for proper runoff accumulation for sediment deposition and to allow for maximum sediment storage capacity behind the device. If a 5 ft (1.5m) distance is not available, due to construction restrictions, a second perimeter control may be installed to increase ponding and sediment accumulation capacity. Steeper slopes allow less sediment storage behind the perimeter control device and may require larger perimeter control or shorter slope lengths.

End Around Flow:
In order to prevent water flowing around the ends of perimeter control, the ends of the perimeter control must be constructed pointing upslope so the ends are at a higher elevation. A minimum of 10 linear ft (3m) per end each placed at a 30 degree angle is recommended.

Vegetated Perimeter Control:
For permanent areas perimeter control can be direct-seeded to allow vegetation established directly in the device, and may be expanded to 5 ft (1.5m) upslope and downslope from the device, for added performance. Vegetation on and around the perimeter control will assist in slowing runoff velocity for increased deposition and filtration of pollutants. The option of adding vegetation will be at the discretion of the Engineer. No additional soil amendments or fertilizer are required for vegetation establishment in the perimeter control.

Slope Spacing & Drainage Area:
Maximum drainage area to, and slope spacing between perimeter control is dependent on: rainfall intensity and duration used for specific design/plan, slope steepness, and width of area draining to the perimeter control. Refer to the Filtrexx Design Tool developed by The Ohio State University to accurately design a plan based on your site and climate conditions. See *Design Capacity Prediction Tool for SiltSoxx™ and Silt Fence* and *Flow-Through Rates and Evaluation of Solids Separation of Compost FilterMedia™ vs. Silt Fence in Sediment Control Applications* (http://www.filtrexx.com/research-library/) for more information on the Design Tool or the research project and results used to create the tool. Figure 1.3 provides an example of the user interface for the Design Tool. A specification for maximum slope lengths, based on a 1 in (25 mm)/24 hr rainfall event is provided in Table 1.3 and Figure 1.2; and for a 2 in (50 mm)/24 hr rainfall event is provided in Table 1.4.

INSTALLATION

1. Perimeter control used for control of sediment and soluble pollutants in storm runoff shall meet Filtrexx Soxx Material Specifications and use Filtrexx Certified FilterMedia.
2. Contractor is required to be Filtrexx Certified or use pre-filled Filtrexx® SiltSoxx™ products manufactured by a Filtrexx Certified Manufacturer as determined by Filtrexx International (call Filtrexx at 877-542-7699 for a current list of installers). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application Look for the Filtrexx Certified Seal.
3. Perimeter control will be placed at locations indicated on plans and in a manner as directed by the Engineer or Manufacturer.
4. Perimeter control should be installed parallel to the base of the slope or other disturbed area.

In challenging conditions (i.e., 2:1 slopes), a second perimeter control shall be constructed at the top of the slope, or staking may be increased.

5. Effective Soxx height in the field should be as follows: 5" diameter Soxx = 4" high; 8" diameter Soxx = 6.5" high; 12" diameter Soxx = 9.5" high; 18" diameter Soxx = 14.5" high; 24" diameter Soxx = 19" high.
6. Stakes should be installed through the middle of the perimeter control on 10 ft (3m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) wooden stakes. 5" diameter Soxx may use 1" (25 mm) x 1" (25 mm) x 18 " (0.5 m) wooden stakes. In the event staking is not possible, i.e., when perimeter control is used on pavement, heavy concrete blocks shall be used behind the perimeter control to help stabilize during rainfall/ runoff events.
7. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
8. Loose compost may be backfilled along the upslope side of the perimeter control, filling the seam between the soil surface and the device, improving filtration and sediment retention.
9. If the perimeter control is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for establishment of permanent vegetation. The Engineer will specify seed requirements.
10. Perimeter control is not to be used in perennial, ephemeral, or intermittent streams.

See design drawing schematic for correct installation (Figure 1.1).

INSPECTION

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Perimeter control should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional perimeter control may be required to reduce effective slope length or sediment removal may be necessary. Perimeter control shall be inspected until area above has been permanently stabilized and construction activity has ceased.

SECTION 4: MAINTENANCE

1. The Contractor shall maintain the perimeter control in a functional condition at all times and it shall be routinely inspected.
2. If the perimeter control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the perimeter control when accumulation has reached 1/2 of the effective height of the Soxx, or as directed by the Engineer. Alternatively, a new perimeter control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.
4. Perimeter control shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.
5. The FilterMedia will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
6. For long-term sediment and pollution control applications, perimeter control can be seeded at the time of installation to create a vegetative filtering system for prolonged and increased filtration of sediment and soluble pollutants (contained vegetative filter strip). The appropriate seed mix shall be determined by the Engineer.

DISPOSAL/RECYCLING

FilterMedia is a composted organic product recycled and manufactured from locally generated organic, natural, and biologically based materials. Once all soil has been stabilized and construction activity has been completed, the FilterMedia may be dispersed with a loader, rake, bulldozer or similar device and may be incorporated into the soil as an amendment or left on the soil surface to aid in permanent seeding or landscaping. Leaving the FilterMedia on site reduces removal and disposal costs compared to other sediment control devices. The mesh netting material

Close Up of Sediment Control

will be extracted from the FilterMedia and disposed of properly by the Contractor. The photodegradable mesh netting material (Soxx) may degrade if left on site. Biodegradable mesh netting material is available and may eliminate the need and cost of removal and disposal.

METHOD OF MEASUREMENT

Bid items shall show measurement as 5 (125), 8 (200), 12 (300), 18 (450), 24 (600), 32 (800) inch (mm) diameter Filtrexx® Sediment/Perimeter Control or SiltSoxx™ per linear foot (or linear meter), installed.

Engineer shall notify Filtrexx of location, description, and details of project prior to the bidding process so that Filtrexx can provide design aid and technical support.

ADDITIONAL INFORMATION

For other references on this topic, including additional research reports and trade magazine and press coverage, visit the Filtrexx website at www.filtrexx.com

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www.filtrexx.com | info@filtrexx.com
Call for complete list of international installers.

REFERENCES CITED & ADDITIONAL RESOURCES

American Association of State Highway Transportation Officials. 2003. Standard Specification for Transportation Materials and Methods of Sampling and Testing, Designation M9-03, Compost for Erosion/Sediment Control. Washington, DC

Faucette, L.B., K. Kerchner, and A. Vick. 2006. Sediment Storage Capacity of Sediment control vs. Silt Fence. Filtrexx® Tech Link #3314

Faucette, L.B., H. Keener, M Klingman, and K. Kerchner. 2006. Design Capacity Prediction Tool for Sediment control and Silt Fence. Filtrexx® Tech Link #3313 (Description of Design Tool) and Filtrexx® Library #301 (Design Tool)

Faucette, L.B. 2006. Flow-Through Rate, Design Height, and Design Capacity of Sediment control and Silt Fence. Filtrexx® Tech Link #3304

Faucette, L.B. 2006. Design Height, Flow-Through Rate, and Slope Spacing of Sediment control and Silt Fence. Filtrexx® Tech Link #3311

Faucette, L.B., and R. Tyler. 2006. Organic BMPs used for Storm Water Management. Proceedings of the International Erosion Control Association Annual Conference, Long Beach, CA 2006.

Faucette, B, F. Shields, and K. Kurtz. 2006. Removing storm water pollutants and determining relations between hydraulic flow-through rates, pollutant removal efficiency, and physical characteristics of compost filter media. Second Interagency Conference on Research in Watersheds, 2006 Proceedings. Coweeta Hydrologic Research Station, NC. Filtrexx® Library #106.

Faucette, B., Sadeghi, A., and K. Sefton. 2006. USDA ARS - Evaluation of Compost Filter Socks and Silt Fence in Sediment and Nutrient Reduction from Runoff. Filtrexx® Tech Link #3308

Faucette, L.B., A. Vick. 2006. LEED Green Building Credits using Filtrexx® Organic BMPs. Filtrexx® Tech Link #3301

Faucette, L.B. A. Vick, and K. Kerchner. 2006. Filtrexx®, Compost, Low Impact Development (LID), and Design Considerations for Storm Water Management. Filtrexx® Tech Link #3306

Faucette L.B., C.F. Jordan, L.M. Risse, M. Cabrera, D.C. Coleman, and L.T. West. 2005.

Evaluation of Storm Water from Compost and Conventional Erosion Control Practices in Construction Activities. Journal of Soil and Water Conservation. 60:6: 288-297.

Faucette, L.B. 2005. Removal and Degradation of Petroleum Hydrocarbons from Storm Water with Compost. Filtrexx® Tech Link #3307

Faucette, L.B. 2005. A Comparison of Performance and Test Methods of Sediment control and Silt Fence. Filtrexx® Tech Link #3302.

Faucette, L.B., N. Strazar, A. Marks. 2006. Filtrexx® Polymer and Flocculent Guide. Filtrexx® Library #601.

Fifield, J. 2001. Designing for Effective Sediment and Erosion Control on Construction Sites. Forester Press, Santa Barbara, CA.

Keener, H., B. Faucette, and M. Klingman. 2006. Flow-through rates and evaluation of solids separation of compost filter media vs. silt fence in sediment control applications. 2006 American Society of Agricultural and Biological Engineers Annual International Conference, Portland, OR. Paper No. 062060.

Marks, A., R. Tyler, and B. Faucette. 2005. The Filtrexx® Library. Digital publication of support tools for the erosion industry. www.filtrexx.com.

Marks, A., and R. Tyler. 2003. Filtrexx International Company Website. Specifications, CAD drawings, case histories. www.filtrexx.com

Sadhegi, A., K. Sefton, and B. Faucette. 2006. Sediment and nutrient removal from storm water with compost filter socks and silt fence. 2006 American Society of Agricultural and Biological Engineers Annual International Conference, Portland, OR. Paper No. 06XXXX

Tyler, R.W., and A. Marks. 2004. Erosion Control Toolbox CD Kit. A Guide to Filtrexx® Products, Educational Supplement, and Project Videos. 3 CD set for Specifications and Design Considerations for Filtrexx® Products.

Tyler, R.W., and A. Marks. 2003. Filtrexx® Product Installation Guide. Grafton, Ohio.

Tyler, R.W., and A. Marks. 2003. A Guide to Filtrexx® Products. Product Descriptions and Specifications for Filtrexx® Products.

Tyler, R.W., J. Hoeck, and J. Giles. 2004. Keys to Understanding How to Use Compost and Organic Matter. IECA Annual Meeting Presentations published as IECA Digital Education Library, Copyright 2004 Blue Sky Broadcast.

Tyler, R.W. 2004. International PCT Patent Publication #: WO 2004/002834 A2. Containment Systems, Methods and Devices for Controlling Erosion. Patent Application Filed on January 8, 2004.

Tyler, R.W. 2003. International PCT Application #: PCTUS2003/020022. Containment Systems, Methods and Devices for Controlling Erosion. Patent Application Filed on June 25, 2003.

Tyler, R.W. 2003. US Patent Publication #: 2003/0031511 A1. Devices, Systems and Methods for Controlling Erosion. Patent Application Filed on January 13, 2003

Tyler, R.W. 2002. US Patent Application #10/208,631. Devices, Systems and Methods for Controlling Erosion. Patent Application Filed on July 31, 2001

Tyler, R.W. 2001. Provisional Patent Application #60/309,054. Devices, Systems and Methods for Controlling Erosion. Patent Application Filed on July 31, 2001

Tyler, R.W. 2001. Filtrexx® Product Manual. Specifications and Design Considerations for Filtrexx® Products, Grafton, OH.

Tyler, R.W. 1996. Winning the Organics Game – The Compost Marketers Handbook. ASHS Press, ISBN # 0-9615027-2-x..

Tyler, R.W. 2007. US Patent # 7,226,240 "Devices, Systems and Methods for Controlling Erosion" Issue date 6-5-07.

US EPA NPDES Phase II. 2006. Compost Filter Socks: Construction Site Storm Water Runoff Control. National Menu of Best Management Practices for Construction Sites. http://cfpub.epa.gov/npdes/stromwater/menuofbmps/con_site.cfm

TABLES & FIGURES:

Table 1.1. Filtrexx® Soxx™ Material Specifications.

Material Type	Cotton BioSoxx™	5 mil High Density Polyethylene (HDPE)	5 mil High Density Polyethylene (HDPE)	Multi-Filament Polypropylene (MFPP, previously HDPP)	Multi-Filament Polypropylene SafteySoxx™	Multi-Filament Polypropylene DuraSoxx®	Multi-Filament Polypropylene DuraSoxx® (Heavy Duty)
Material Characteristic	Biodegradable	Oxo-degradable	Photodegradable	Photodegradable	Photodegradable	Photodegradable	Photodegradable
Design Diameters	8 in (200mm), 12 in (300mm)	8 in (200mm), 12 in (300mm), 18 in (400mm)	5 in (125mm), 8 in (200mm), 12 in (300mm), 18 in (400mm)	8 in (200mm), 12 in (300mm), 18 in (400mm), 24 in (600mm), 32 in (800mm)	8 in (200mm), 12 in (300mm), 18 in (400mm)	8 in (200mm), 12 in (300mm), 18 in (400mm), 24 in (600mm), 32 in (800mm)	5 in (125mm), 8 in (200mm), 12 in (300mm), 18 in (400mm)
Mesh Opening	1/8 in (3mm)	3/8 in (10mm)	3/8 in (10mm)	3/8 in (10mm)	1/8 in (3mm)	1/8 in (3mm)	1/8 in (3mm)
Tensile Strength	44 psi (3.09 kg/cm^2)	26 psi (1.83 kg/cm^2)	26 psi (1.83 kg/cm^2)	44 psi (3.09 kg/cm^2)	202 psi (14.2 kg/cm^2)*	202 psi (14.2 kg/cm^2)	242 psi (16.99 kg/cm^2)
% Original Strength from Ultraviolet Exposure (ASTM G-155)	ND	ND	23% at 1000 hr	100% at 1000 hr	100% at 1000 hr	100% at 1000 hr	100% at 1000 hr
Functional Longevity/ Project Duration***	up to 12 months**	6 mo-3.5 yr	9 mo-4 yr	1-4 yr	2-5 yr	2-5 yr	2-5 yr

* Tested at Texas Transportation Institute/Texas A&M University (ASTM 5035-95).
** Data based on Caltrans research and specifications
*** Functional longevity ranges are estimates only. Site specific environmental conditions may result in significantly shorter or longer time periods.

Table 1.2. Filtrexx® Sediment Control Performance and Design Specifications Summary.

Design Diameter / **Design & Performance**	**5 in (125mm)**	**8 in (200mm)**	**12 in (300mm)**	**18 in (450mm)**	**24 in (600mm)**	**32 in (800mm)**	**Testing Lab/ Reference**	**Publication(s)**
Effective Height	4 in (100mm)	6.5 in (160mm)	9.5 in (240mm)	14.5 in (360mm)	19 in (480mm)	26 in (650mm)	The Ohio State University, Ohio Agricultural Research and Development Center	Transactions of the American Society of Agricultural & Biological Engineers, 2006
Effective Circumference	15 in (380mm)	25 in (630mm)	38 in (960mm)	57 in (1450mm)	75 in (1900mm)	100 in (2500mm)		
Density (when filled)	7.8 lbs (12 kg/m)	13 lbs/ft (20 kg/m)	32 lbs/ft (50 kg/m)	67 lbs/ft (100 kg/m)	133 lbs/ft (200 kg/m)	200 lbs/ft (300 kg/m)	Soil Control Lab, Inc	
Air Space	20%	20%	20%	20%	20%	20%	Soil Control Lab, Inc	
Maximum continuous length	unlimited	unlimited	unlimited	unlimited	unlimited	unlimited		
Staking Requirement	10 ft (3m)	10 ft (3m)	10 ft (3m)	10 ft (3m)	10 ft (3m)	10 ft (3m)		
Maintenance Requirement (sediment accumulation removal at X height)	2 in (50mm)	3.25 in (80mm)	4.75 in (120mm)	7.25 in (180mm)	9.5 in (240mm)	13 in (325mm)		

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Table 1.2. Filtrexx® Sediment Control Performance and Design Specifications Summary. (continued)

Design Diameter / Design & Performance	5 in (125mm)	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Initial Maintenance Requirement based on Rainfall-Runoff*	13 in (33 cm); 665 L/linear m	22 in (55 cm); 1109 L/linear m	32 in (80 cm); 1388 L/linear m	42 in (105 cm); 1825 L/linear m	64 in (160 cm); 2776 L/linear m	86 in (215 cm); 3885 L/linear m	The University of Georgia & Auburn University	
Functional Longevity**	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr		
Maximum Slope Length (<2%)	360 ft (110m)	600 ft (183m)	750 ft (229m)	1000 ft (305m)	1300 ft (396m)	1650 ft (500m)	The Ohio State University, Ohio Agricultural Research and Development Center	Filtrexx® Design Tool™, Filtrexx® Library #301, Filtrexx® Tech Link #3304 & #3311
Hydraulic Flow Through Rate	4.5 gpm/ft (56 L/min/m)	7.5 gpm/ft (94 L/min/m)	11.3 gpm/ft (141 L/min/m)	15.0 gpm/ft (188 L/min/m)	22.5 gpm/ft (281 L/min/m)	30.0 gpm/ft (374 L/min/m)	The Ohio State University, Ohio Agricultural Research and Development Center; University of Guelph, School of Engineering/ Watershed Research Group	Filtrexx® Tech Link #3311 & #3313, #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006, Second Interagency Conference on Research in Watersheds, 2006
P Factor (RUSLE)	0.1-0.32	0.1-0.32	0.1-0.32	0.1-0.32	0.1-0.32	0.1-0.32	USDA ARS Environmental Quality Lab/ University of Georgia	American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Sediment Storage Capacity***	104 cu. in (1710cc)	174 cu. in (2850cc)	396 cu. in (6490cc)	857 cu. in (14040cc)	1631 cu. in (26840cc)	2647 cu. in (43377 cc)		Filtrexx® Tech Link #3314
Total Solids Removal	98%	98%	98%	98%	98%	98%	Soil Control Lab, Inc	International Erosion Control Association, 2006
Total Suspended Solids Removal	78%	78%	78%	78%	78%	78%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006

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Table 1.2. Filtrexx® Sediment Control Performance and Design Specifications Summary. (continued)

Design Diameter / Design & Performance	5 in (125mm)	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Turbidity Reduction	63%	63%	63%	63%	63%	63%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Clay (<0.002mm) Removal	65%	65%	65%	65%	65%	65%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Silt (0.002-0.05mm) Removal	64%	64%	64%	64%	64%	64%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
TSS Removal w/PAM	97%	97%	97%	97%	97%	97%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
TSS Removal w/ Flocculent	97%	97%	97%	97%	97%	97%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Turbidity Reduction w/PAM	98%	98%	98%	98%	98%	98%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Turbidity Reduction w/ Flocculent	94%	94%	94%	94%	94%	94%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006

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Table 1.2. Filtrexx® Sediment Control Performance and Design Specifications Summary. (continued)

Design Diameter / Design & Performance	5 in (125mm)	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Total Phosphorus Removal	34%	34%	34%	34%	34%	34%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Reactive Phosphorus Removal	38%	38%	38%	38%	38%	38%	USDA ARS Environmental Quality Lab	American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Total Phosphorus Removal w/ Nutrient Agent	60%	60%	60%	60%	60%	60%	USDA ARS Environmental Quality Lab	American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Reactive Phosphorus Removal w/ Nutrient Agent	99%	99%	99%	99%	99%	99%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Nitrate-N Removal	25%	25%	25%	25%	25%	25%	USDA ARS Environmental Quality Lab	American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Ammonium-N Removal	15%	15%	15%	15%	15%	15%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Ammonium-N Removal w/ Nutrient Agent	33%	33%	33%	33%	33%	33%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Motor Oil Removal w/ Hydrocarbon Agent	99%	99%	99%	99%	99%	99%	USDA ARS Environmental Quality Lab	International Erosion Control Association, 2006
Diesel Fuel Removal w/ Hydrocarbon Agent	99%	99%	99%	99%	99%	99%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Gasoline Removal w/ Hydrocarbon Agent	54%	54%	54%	54%	54%	54%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link

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Table 1.2. Filtrexx® Sediment Control Performance and Design Specifications Summary. (continued)

Design Diameter / Design & Performance	5 in (125mm)	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Cadmium (Cd) Removal w/ Heavy Metal Agent	73%	73%	73%	73%	73%	73%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Chromium (Cr) Removal w/ Heavy Metal Agent	47%	47%	47%	47%	47%	47%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Copper (Cu) Removal w/ Heavy Metal Agent	70%	70%	70%	70%	70%	70%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Nickel (Ni) Removal w/ Heavy Metal Agent	69%	69%	69%	69%	69%	69%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Lead (Pb) Removal w/ Heavy Metal Agent	73%	73%	73%	73%	73%	73%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Zinc (Zn) Removal w/ Heavy Metal Agent	53%	53%	53%	53%	53%	53%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Iron (Fe) Removal	22%	22%	22%	22%	22%	22%	Soil Control Lab, Inc	
Manganese (Mn) Removal	8%	8%	8%	8%	8%	8%	Soil Control Lab, Inc	
Total coliform Removal	67%	67%	67%	67%	67%	67%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
E. coli Removal	67%	67%	67%	67%	67%	67%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Enterococcus Removal	47%	47%	47%	47%	47%	47%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
E. coli Removal w/ Bacteria Agent	98%	98%	98%	98%	98%	98%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Fecal coliform Removal w/ Bacteria Agent	98%	98%	98%	98%	98%	98%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Enterococcus Removal w/ Bacteria Agent	91%	91%	91%	91%	91%	91%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Other Recommended Uses	Slope Interruption	Inlet Protection, Ditch Protection, Slope Interruption	Inlet protection, Ditch Protection, Concrete Washout, Filtration System, Slope Interruption	Ditch Protection, Concrete Washout, Filtration System	Ditch Protection, Concrete Washout, Filtration System	Ditch Protection, Concrete Washout, Filtration System		

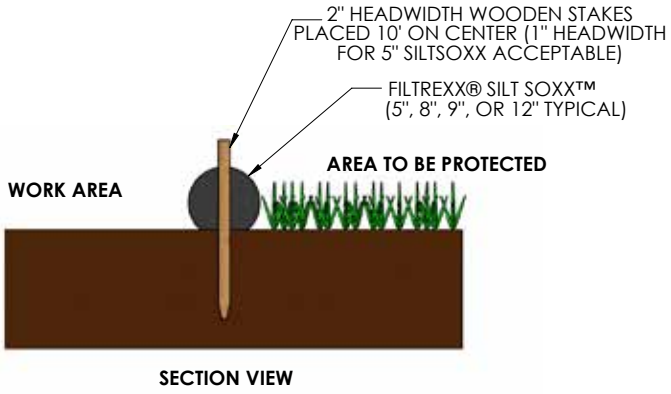
* Based on rainfall intensity of 12.5 cm (5 in)/hr applied to a bare clay loam soil at a 10% slope; runoff flow rate of 108 ml/sec/linear m (0.52 gpm/linear ft); and mean runoff volume of 230 L/m2 (6.3 g/ft2).

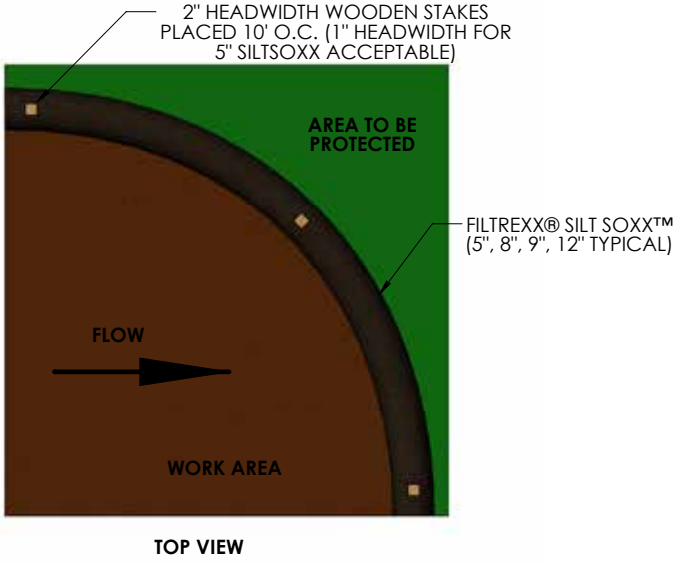
** Functional Longevity is dependent on mesh material type, UV exposure, freeze/thaw frequency, region of US/Canada, runoff-sediment frequency/durtion/ loading, and adherence to specified maintenance requirement. Functional longevity ranges are estimates only. Site specific environmental conditions may result in significantly shorter or longer time periods.

*** Sediment Storage Capacity = sediment accumulation behind (directly upslope) + within the device.

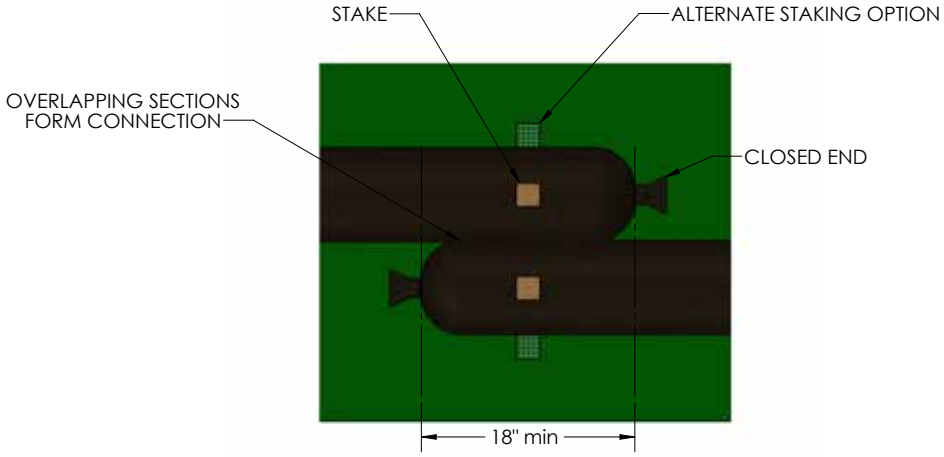
Figure 1.1. Engineering Design Drawing for Perimeter Control

FILTREXX® SILT SOXX™

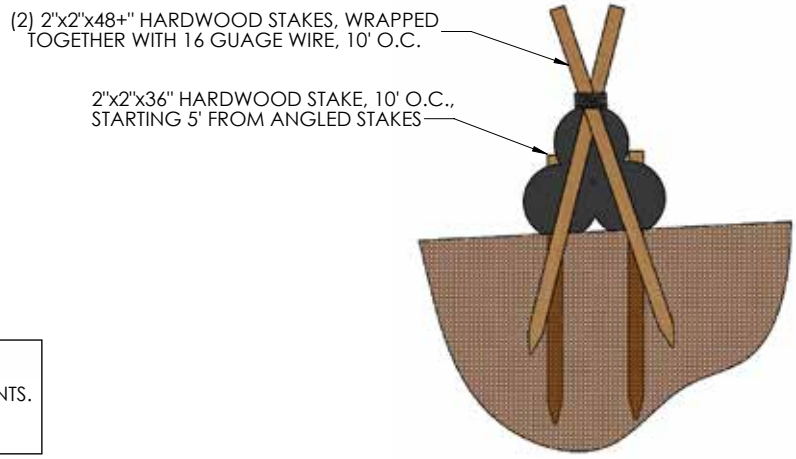




COMPOST SOCK CONNECTION/ATTACHMENT DETAIL



FILTREXX® PYRAMID STAKING DETAIL



NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. SILT SOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

Figure 1.2. Maximum Slope Lengths of Filtrexx® Perimeter Control Based on a 1 in (25 mm)/24 hr Rainfall Event.

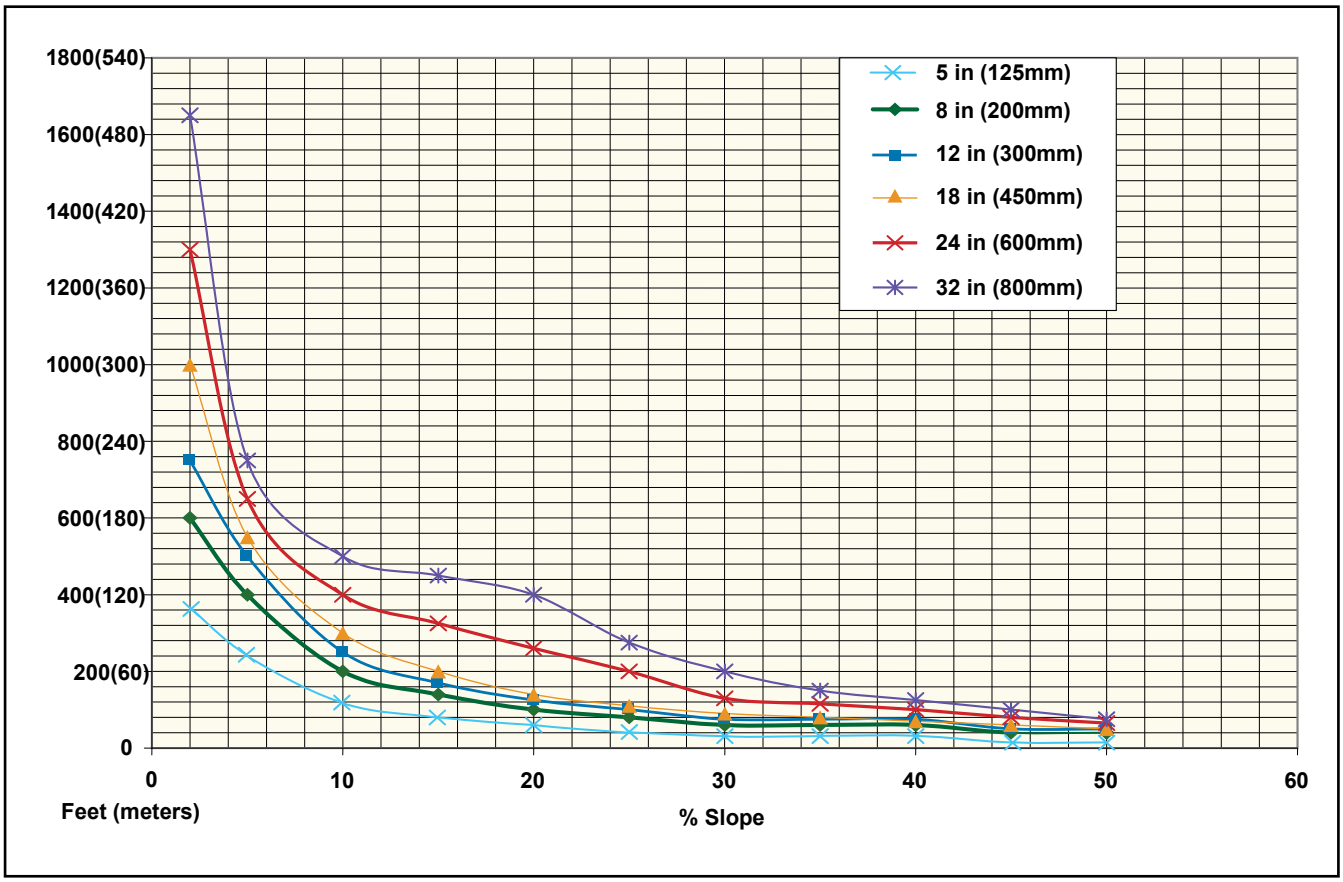


Table 1.3. Maximum Slope Lengths for Filtrexx® Perimeter Control Based on a 1 in (25 mm)/24 hr Rainfall Event.

Slope Percent	Maximum Slope Length Above Sediment Control in Feet (meters)*					
	5 in (125 mm) Sediment control	8 in (200 mm) Sediment control	12 in (300 mm) Sediment control	18 in (450 mm) Sediment control	24 in (600mm) Sediment control	32 in (800mm) Sediment control
	4 in (100 mm)**	6.5 in (160 mm)**	9.5 in (240 mm) **	14.5 in (360 mm) **	19 in (480 mm) **	26 in (650 mm) **
2 (or less)	360 (110)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	240 (73)	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	120 (37)	200 (60)	250 (75)	300 (90)	400 (120)	500 (150)
15	85 (26)	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	60 (18)	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	48 (15)	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	36 (11)	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	36 (11)	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	36 (11)	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	24 (7)	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	24 (7)	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

* Based on a failure point of 36 in (0.9 m) super silt fence (wire reinforced) at 1000 ft (303 m) of slope, watershed width equivalent to receiving length of sediment control device, 1 in/ 24 hr (25 mm/24 hr) rain event.

** Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.

Table. 1.4. Maximum Slope Lengths for Filtrexx® Perimeter Control Based on a 2 in (50 mm)/24 hr Rainfall Event.

Slope Percent	Maximum Slope Length Above Sediment Control in Feet (meters)*					
	5 in (125 mm) Sediment control	8 in (200 mm) Sediment control	12 in (300 mm) Sediment control	18 in (450 mm) Sediment control	24 in (600mm) Sediment control	32 in (800mm) Sediment control
	4 in (100 mm)**	6.5 in (160 mm) **	9.5 in (240 mm) **	14.5 in (360 mm) **	19 in (480 mm) **	26 in (650 mm) **
2 (or less)	180 (55)	300 (90)	375 (110)	500 (150)	650 (200)	850 (260)
5	120 (37)	200 (60)	250 (75)	275 (85)	325 (100)	400 (120)
10	60 (18)	100 (30)	125 (35)	150 (45)	200 (60)	275 (85)
15	42 (13)	70 (20)	85 (25)	100 (30)	160 (50)	225 (70)
20	30 (9)	50 (15)	65 (20)	70 (20)	130 (40)	180 (55)
25	24 (7)	40 (12)	50 (15)	55 (16)	100 (30)	150 (45)
30	18 (6)	30 (9)	40 (12)	45 (13)	65 (20)	100 (30)
35	18 (6)	30 (9)	40 (12)	45 (13)	55 (18)	75 (23)
40	18 (6)	30 (9)	40 (12)	45 (13)	50 (15)	60 (38)
45	12 (4)	20 (6)	25 (8)	30 (9)	40 (12)	50 (15)
50	12 (4)	20 (6)	25 (8)	30 (9)	35 (10)	40 (12)

* Based on a failure point of 36 in (0.9 m) super silt fence (wire reinforced) at 1000 ft (303 m) of slope, watershed width equivalent to receiving length of sediment control device, 2 in/ 24 hr (50 mm/24 hr) rain event.

** Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.

SMARTfence® 36

Section 1: Definition

A temporary sediment barrier for perimeter control.

Purpose

1. To intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site.
2. To decrease the velocity of sheet flows and low-to-moderate level channel flows.

Conditions Where Practice Applies

1. Below disturbed areas where erosion could occur in the form of sheet or rill erosion.

Planning Considerations

1. SMARTfence® 36 can be placed at the top, on the face, or at the toe of slopes to intercept runoff, reduce flow velocity, releasing the runoff as sheet flow, and provide reduction/removal of suspended solids from the runoff.
2. Minimum 6" trenching is required for the installation of SMARTfence® 36.
3. Where the size of the drainage area is no more than one quarter acre per 100 feet of silt fence length; the maximum slope length behind the barrier is 100 feet; and the maximum gradient behind the barrier is 50 percent (2:1).
4. In minor swales or ditch lines where the maximum contributing drainage area is no greater than 1 acre and flow is no greater than 1 cfs.
5. Silt fence will not be used in areas where rock or some other hard surface prevents the full and uniform depth anchoring of the barrier.

Section 2: Construction Specifications

1. Prepare bed for installation by removing any large debris including rocks, soil clods, and woody vegetation (greater than 1 inch in size).
2. Rake bed area with a hand rake or by drag harrow.
3. All surfaces shall be uniformly and well-compacted for maximum seating and stability.

Section 3: Design Criteria

1. Where the size of the drainage area is no more than one quarter acre per 100 feet of SMARTfence® 36.
2. See spacing recommendations chart for slope percentages.

Section 4: Maintenance

1. Silt fences shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.
2. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting.
3. Should the fabric on a silt fence decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.
4. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
5. Any sediment deposits remaining in place after the silt fence is no longer required shall be dressed to conform with the existing grade, prepared and seeded.

SEDIMENT & PERIMETER CONTROL

SMARTfence®36

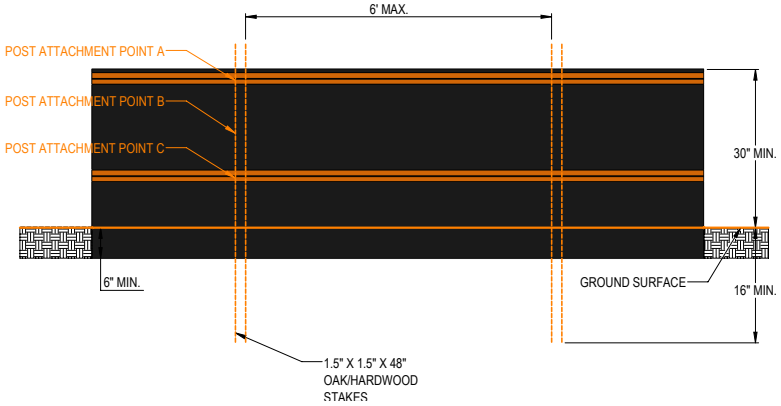
High-Tensile/High-Modulus Woven Geotextile Sediment Fence

SMARTfence® 36 is a heavy-duty, high-tensile/high-modulus, woven geotextile sediment fence. Designed using a value engineering approach, it is equivalent in strength and stiffness to that of wire or chain-link backed silt fence for less money, significantly lower carbon emissions and less material waste.

The woven geotextile fence is specifically designed and fabricated to withstand high-tensile stresses and to prevent excessive material elongation and strain. It is built to resist fence deflection and ultimate failure due to ripping, sagging, or overturning from forces associated with excessive backwater depths, debris flows and overtopping.

SMARTfence® 36 is a 100% American made product.

NTPEP Compliant | GTX-2018-01-188



ADVANTAGES

- No wire or chain-link backing necessary
- High-tensile / high-modulus - able to resist fence deflection and failure
- Reduced labor costs

For more information about Perimeter & Sediment Control,
contact our Inside Sales team at 800.448.3636 email at info@acfenv.com

The below table shows a comparison of 14-gauge wire-backing fence and 12.5 gauge chain-link fence structural characteristics versus Smartfence® 36. The Modulus of Elasticity is a measure of material stiffness.

Structural comparisons between wire and chain-link backing versus SMARTfence® 36

	14-GAUGE WIRE FENCE 2"x4" mesh	12.5 GAUGE CHAIN-LINK FENCE 2 3/8" mesh	SMARTfence® 36 (MARV)
Average Breaking Tensile Strength (lb/ft)	710 (Average)	1,930 (Average)	>4,300 (MARV)
Average Modulus of Elasticity (lb/ft)	2,600 lengthwise 19,400 widthwise	9,422 lengthwise 7,600 widthwise	>39,000 lengthwise >32,000 widthwise

PRODUCT SPECIFICATIONS

TEST METHOD	MINIMUM AVERAGE ROLE VALUES (MARV)	TEST METHOD	MINIMUM AVERAGE ROLE VALUES (MARV)
Wide Width Tensile Strength (ASTM D 4595)	>4,300 lbs/ft - MD x >2,900 lbs/ft - TD	Mullen Burst (ASTM D 3786)	>850 psi
Wide Width Test Elongation (ASTM D 4595)	<11% - MD x <9% - TD	Apparent Opening Size (ASTM D 4751)	Sieve No. 50
Grab Tensile Strength (ASTM D 4632)	>500 lbs - MD x >200 bs - TD	Water Flux (ASTM D 4491)	>50 gpm/sq ft
CBR Puncture (ASTM D 6241)	>1,800 lbs	UV Stability (ASTM D 4355)	>90% strength retained - MD
Trapezoidal Tear (ASTM D 4533)	>160 lbs - MD x >125 lbs - TD		

MD = Machine Direction
TD = Tranverse Direction
TEsting performed by TRI Environmental, Inc.

SMARTfence® 36 is NTPEP Compliant

GTX-2018-01-188

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LET'S GET IT DONE®
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Thrace Nonwovens & Geosynthetics TPG400EOMM Silt Fence

Section 1: Definition

A temporary sediment barrier for perimeter control.

Purpose

1. To intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site.
2. To decrease the velocity of sheet flows and low-to-moderate level channel flows.

Conditions Where Practice Applies

1. Below disturbed areas where erosion could occur in the form of sheet or rill erosion.

Planning Considerations

1. This geotextile silt fence can be placed at the top, on the face, or at the toe of slopes to intercept runoff, reduce flow velocity, releasing the runoff as sheet flow, and provide reduction/removal of suspended solids from the runoff.
2. Where the size of the drainage area is no more than one quarter acre per 100 feet of silt fence length; the maximum slope length behind the barrier is 100 feet; and the maximum gradient behind the barrier is 50 percent (2:1).
3. Silt fence will not be used in areas where rock or some other hard surface prevents the full and uniform depth anchoring of the barrier.

Section 2: Construction Specifications

1. Prepare bed for installation by removing any large debris including rocks, soil clods, and woody vegetation (greater than 1 inch in size).
2. Rake bed area.
3. All surfaces shall be uniformly and well-compacted for maximum seating and stability.
4. Contains a 1/4" indicator line for proper burial.

Section 3: Design Criteria

1. No formal design required.
2. Where the size of the drainage area is no more than one quarter acre per 100 feet of silt fence.

Section 4: Maintenance

1. Silt fences shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.
2. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting.
3. Should the fabric on a silt fence decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.
4. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
5. Any sediment deposits remaining in place after the silt fence is no longer required shall be dressed to conform with the existing grade, prepared and seeded.

Colonial Construction Materials

Issue 26D: 17-Feb-2021

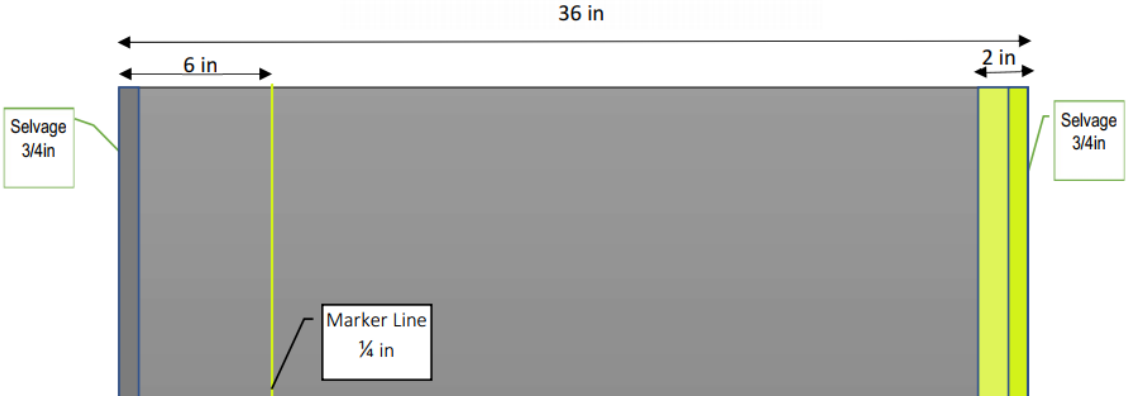
Product Data Sheet

TPG400EO SILT FENCE

2M091200B400EOMM

TPG400EO SILT FENCE is a polypropylene woven geotextile silt fence. It is manufactured at one of Thrace Nonwovens & Geosynthetics SA facilities that have achieved **ISO 9001** certification for its systematic approach to quality, as well as **ISO 14001** for its safe environmental practices. It is resistant to commonly encountered soil chemicals, mildew and insects and is non-biodegradable.

PROPERTY	TEST METHOD	UNIT	VALUE
MECHANICAL			
Grab Tensile Strength (MD/CD)	ASTM D4632	lbf (kN)	370/180 (1.65/0.80)
Grab Elongation (MD/CD)	ASTM D4632	%	19/10
Trapezoidal Tear (MD/CD)	ASTM D4533	lbf (kN)	115/75 (0.51/0.33)
CBR Puncture Strength	ASTM D6241	lbf (kN)	675 (3.00)
HYDRAULIC			
Apparent Opening Size (AOS)	ASTM D4751	US Sieve (mm)	40 (0.425)
Permittivity	ASTM D4491	1/sec	2.1
Water Flow Rate	ASTM D4491	gpm/ft^2 (lt/m^2/s)	154.6 (105)
PHYSICAL			
Mass/Unit Area	ASTM D5261	oz/sq.yd (g/m^2)	5.6 (190)
ENDURANCE			
UV Resistance	ASTM D4355	%	>80
STANDARD PACKAGING			
Roll Width		ft (cm)	36 (91.5)
Roll Length		ft	500 (152.4)



NOTES - DISCLAIMER:

THRACE NONWOVENS & GEOSYNTHETICS SA reserves the right to alter product specifications without prior notice. It is the responsibility of all users to satisfy themselves that the above data are current.

- MD indicates Machine Direction and CD indicates Cross Direction
- All values listed are minimum average roll values (MARV), unless otherwise noted.
- AOS reported as maximum average value.

ASTM INTERNATIONAL MEMBER

TÜV AUSTRIA HELLAS EN ISO 9001:2015 No. : 01010018

TÜV AUSTRIA HELLAS EN ISO 14001:2015 No. : 20051180000289

THRACE NONWOVENS & GEOSYNTHETICS S.A.

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www.thracegroup.com

STORM DRAIN INLET PROTECTION (VESCH MINIMUM STANDARDS AND SPECIFICATIONS 3.07)

American Excelsior Company®
Earth Science Division

Proud Participant in NTPEP and Proud Member of:

Curlex® Sediment Log®
SPECIFICATION

SECTION 1 - GENERAL

1.01 Summary

A. The sediment log contains excelsior wood fiber for the purpose of slowing water velocity and trapping sediment as described herein.

B. This work shall consist of furnishing and installing the sediment log; including fine grading, installing, staking, and miscellaneous related work, in accordance with these standard specifications and at the locations identified on drawings or designated by the owner's representative. This work shall include all necessary materials, labor, supervision, and equipment for installation of a complete system.

C. All work of this section shall be performed in accordance with the conditions and requirements of the contract documents.

D. The sediment log shall be used to slow water velocity, trap sediment, and enhance revegetation. Based on a project-by-project engineering analysis, the sediment log shall be suitable for the following applications:

1. Perpendicular to the flow of water in ditch bottoms, swales, and waterways
2. As wattles on slopes
3. Around job sites or perimeter control
4. Around inlets and outlets
5. Project ingress and egress termination points
6. All other filtering applications
7. In place of bales, silt fence, and rock checks

1.02 Performance Requirements

A. Sediment log shall provide temporary, biodegradable channel and slope interruption by slowing water velocity to reduce shear stress and soil erosion while enhancing revegetation. Sediment log performance capabilities shall be determined by large-scale testing deemed acceptable by the design engineer.

B. Sediment log performance requirements:

Property	Value	Method
Flow Rate (GPM/ft^2)	≥ 35	ASTM D5141
Soil Retention Effectiveness	≥ 96%	ASTM D7351
Channel Soil Loss Reduction (%)	≥ 50	ASTM D7208
pH Buffering	8 ± 3	ASTM D1117, modified
Functional Longevity[a]	≤ 24 Months	Documented laboratory and field studies
Oil Sorbent	Preapproved	U.S. Environmental Protection Agency
Removal of Polynuclear Aromatic Hydrocarbons (PAHs)	≥ 95%	Quantified research[b]
Fly Ash Filtration (TSS)	≥ 78%	Quantified research[c]
Fly Ash Filtration (NTU)	≥ 76%	Quantified research[c]

[a] Functional longevity varies from region to region because of differences in climatic conditions.

[b] Boving and Zhang, Chemosphere 54 (2004) 831-839.

[c] Kelsey, K. and M. Murley. (2017, January). *Fly Ash Slurry Filtration Using Curlex® Sediment Log® - Quantifying Total Suspended Solids and Turbidity Reduction.* Unpublished internal document, ErosionLab.

1.03 Submittals

A. Submittals shall include complete design data, Product Netting Information, SDS, Installation Guidelines, Manufacturing Material Specifications, Manufacturing Certifications, Staking Pattern Guide, CAD details, and a Manufacturing Quality Control Program. In addition, the Manufacturer shall provide a test report providing data showing the performance capabilities of the sediment log, along with reference installations similar in size and scope to that specified for the project.

1.04 Delivery, Storage, and Handling

A. Sediment log shall be furnished on pallets or master packs.

B. Sediment log may be compressed when packaged. The unique packaging can result in a less than symmetrical shape upon arrival to the jobsite. This will not affect the performance capability of the Sediment log because unique Great Lakes aspen excelsior fibers naturally expand upon wetting and return to a symmetrical tubular shape.

C. Sediment log shall be free of defects and voids that would interfere with proper installation or impair performance.

D. Sediment log shall be stored by the Contractor in a manner that protects them from damage by construction activities.

SECTION 2: MATERIAL/PRODUCTS

2.01 Sediment Log

A. Sediment logs shall be Curlex Sediment Logs, as manufactured by American Excelsior Company, Arlington, TX (800-777-7645).

B. Curlex Sediment Log consist of a specific cut of naturally seed free Great Lakes Aspen wood excelsior with 80% of the fiber ≥ 6 inches in length inside a durable, flexible tubular netting with knotted ends. Curlex Sediment Log is designed to provide intimate contact with the soil, which prevents blowouts and undermining. Curlex Sediment Log allows water to flow through the 100% excelsior matrix, minimizing overtopping, slowing high flow water velocities, and intercepting and stopping silt movement. Curlex Sediment Logs may be installed over bare soil, over rolled erosion control products, on steep slopes, around inlets and outlets, or around jobsites for perimeter control. Curlex Sediment Log shall be manufactured in the U.S.A. at company locations where QA/QC is implemented and managed by the manufacturer. Field fabricated products and products made by anyone other than the manufacturer (i.e. distributors, dealers, etc.) shall not be accepted.

C. Sediment logs shall have the following nominal material characteristics:

PROPERTY	ENGLISH	METRIC
Product Name	6 in 9 in 12 in 20 in	15.2 cm 22.9 cm 30.5 cm 50.1 cm
Minimum Diameter	5.5 in 8.0 in 11.0 in 18.0 in	14.0 cm 20.3 cm 27.9 cm 45.7 cm
Log Density [d] (± 10 %)	(6 in) 2.44 lb/ft^3 (9 in) 2.26 lb/ft^3 (12 in) 2.54 lb/ft^3 (20 in) 1.38 lb/ft^3	39.09 kg/m^3 36.20 kg/m^3 40.69 kg/m^3 22.11 kg/m^3
Fiber Length (80% min.)	≥ 6.0 in	≥ 15.2 cm
Log Dimensions (W x L) (± 10 %)	6 in x 25 ft 9 in x 25 ft 12 in x 10.0 ft 20 in x 10.0 ft	0.1520 m x 7.620 m 0.2290 m x 7.620 m 0.3048 m x 3.048 m 0.5080 m x 3.048 m

[d] Weight and density are based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

2.02 Stakes

A. Stakes shall be wooden, 1 1/8 in wide x 1 1/8 in thick by a minimum of 30 in long for 6 in, 9 in, and 12 in Curlex Sediment Logs and 48 in long for 20 in Curlex Sediment Logs.

B. 6 inch and 9 inch Curlex Sediment Logs may also be anchored with E-Staples®, 1 in x 6 in, U-shaped, 11 gauge wire staples, 2 in x 8 in, U-shaped, 8 gauge wire staples. Anchoring with staples shall not be used in channelized flow applications. Stakes may be used in conjunction with staples for additional anchoring of 6 inch and 9 inch Curlex Sediment Logs, as deemed necessary by the Engineer.

SECTION 3: EXECUTION

3.01 Sediment Log Supplier Representation

A. Contractor shall coordinate with the log supplier for a qualified representative to be present on the job site at the start of installation to provide technical assistance as needed. Contractor shall remain solely responsible for the quality of installation.

3.02 Site Preparation

A. Before placing sediment logs, the Contractor shall certify that the subgrade has been properly compacted, graded smooth, has no depressions, voids, soft or uncompacted areas, is free from obstructions such as tree roots, protruding stones or other foreign matter, and is seeded and fertilized according to project specifications where applicable. The Contractor shall not proceed until all unsatisfactory conditions have been remedied. By beginning construction, Contractor signifies that the preceding work is in conformance with this specification.

B. Contractor shall fine grade the subgrade by hand dressing where necessary to remove local deviations.

C. No vehicular traffic shall be permitted directly on the sediment log.

3.03 Installation

A. Sediment log shall be installed as directed by the owner's representative in accordance to manufacturer's Installation Guidelines, Staking Pattern Guide, and CAD details. The extent of sediment logs shall be as shown on the project drawings.

B. Sediment log should be installed to intercept water flow and collect sediment on site. They may be placed over bare soil or on top of erosion control blankets. Sediment logs are typically installed laying on flat ground and not trenched.

C. They shall be secured to the subgrade by wood stakes every two lineal feet across the length of the sediment log. The stakes shall be intertwined with the outer mesh of the sediment log only and driven into the ground a minimum of 16 inches on the downstream side of the sediment log.

D. 6 inch and 9 inch Curlex Sediment Logs can also be installed to the subgrade with E-Staples or wire staples. Staples shall be installed every two lineal feet across the length on each side of the sediment log. The two rows of staples shall be staggered by one foot along the length of the sediment log. All staples shall be fully inserted into the subgrade below the sediment log.

E. Sediment log installed in a swale or channel bottom shall allow the installation to continue up the slopes three feet above the anticipated high water mark and perpendicular to the flow of water.

F. Spacing of sediment logs shall be such that the elevation of the bottom of the sediment log upstream will be equal to the elevation of the top of the log downstream.

G. Sediment log shall remain in place until fully established vegetation and root systems are present.

SECTION 4: MAINTENANCE

A. Sediment log shall not be defective or damaged. Damaged or defective materials shall be replaced at no additional cost to the owner.

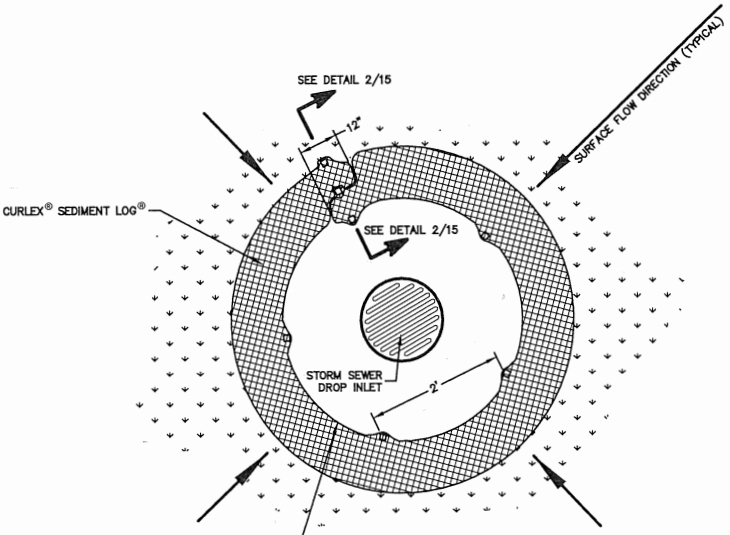
B. The Contractor shall maintain the sediment log in a functional condition at all times and it shall be routinely inspected.

C. If the sediment log has been damaged, it shall be repaired, or replaced if beyond repair.

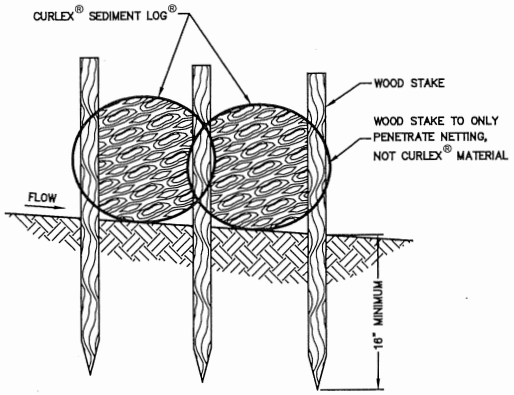
D. The Contractor shall remove sediment at the base of the upslope side of the sediment log when accumulation has reached 1/2 of the effective height of the sediment log or as directed by the Engineer.

E. Sediment log shall be maintained until disturbed area above or around the device has been permanently stabilized and construction activity has ceased.

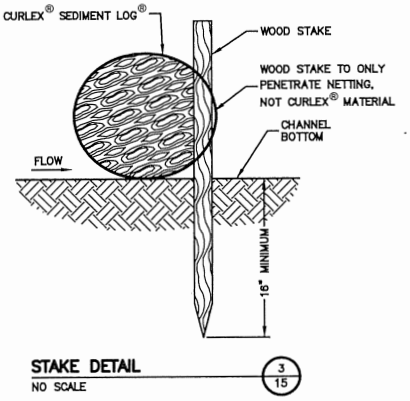
F. At the completion of this scope of work, Contractor shall remove from the job site and properlydispose of all remaining debris, waste materials, excess materials, and equipment required of or created by Contractor. Disposal of waste materials shall be solely the responsibility of Contractor and shall be done in accordance with applicable waste disposal regulations.



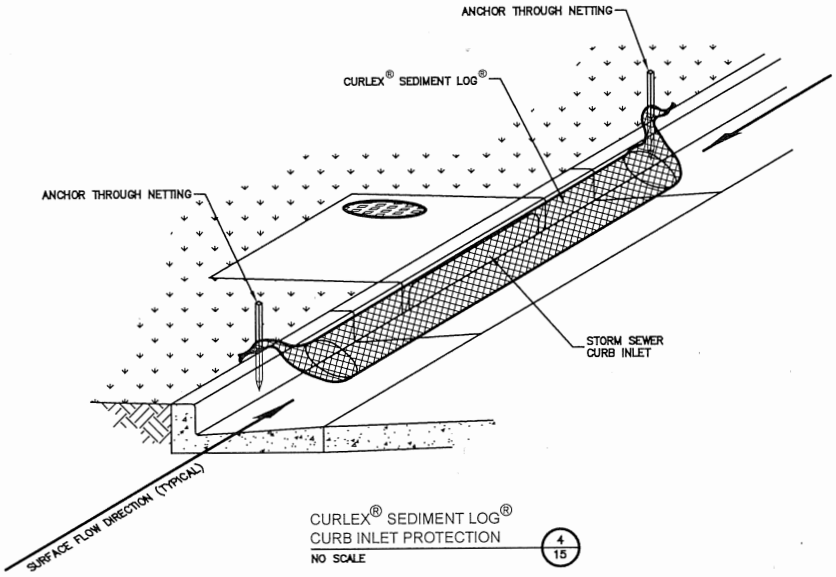
CURLEX® SEDIMENT LOG®
DROP INLET PROTECTION
NO SCALE (1/15)



STAKE DETAIL
NO SCALE (2/15)



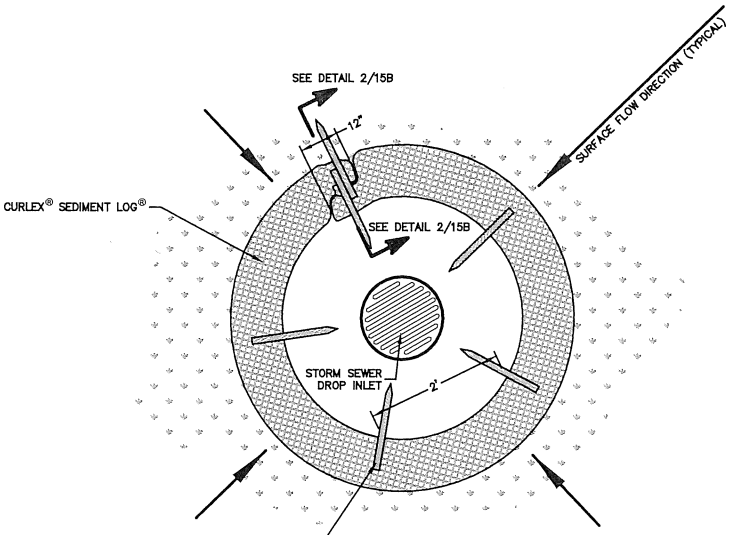
STAKE DETAIL
NO SCALE (3/15)



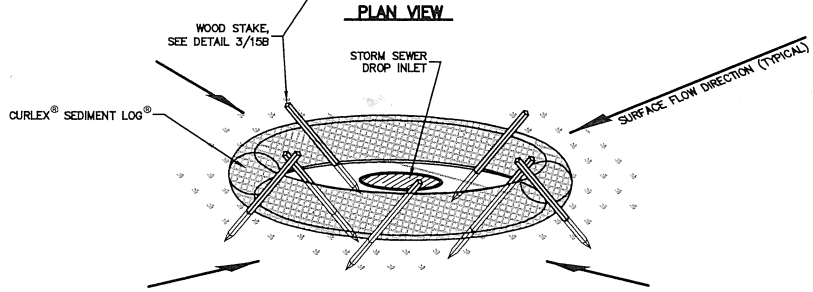
CURLEX® SEDIMENT LOG®
CURB INLET PROTECTION
NO SCALE (4/15)

American Excelsior Company®
Earth Science Division

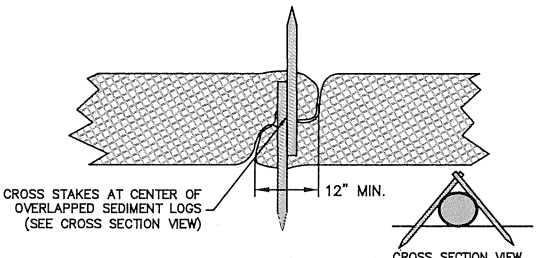
AMERICAN EXCELSIOR COMPANY ARLINGTON, TEXAS	SHEET DESCRIPTION: CURLEX® SEDIMENT LOG® INLET PROTECTION DETAILS	DATE 3/27/17	DRAWN BY	
		SCALE: NONE	PROJECT NO.	SHEET NO. 15



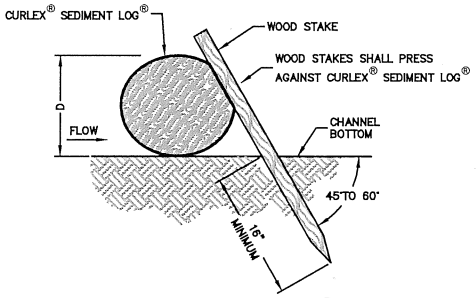
PLAN VIEW



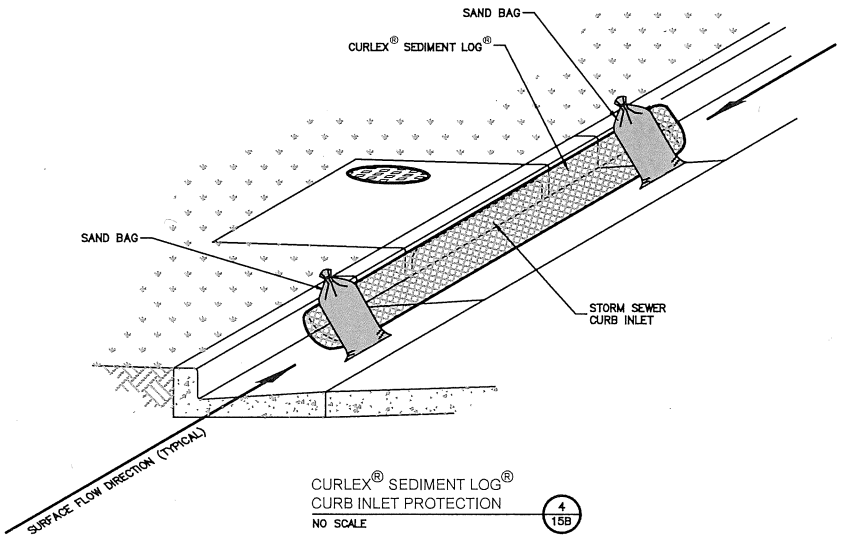
CURLEX® SEDIMENT LOG®
DROP INLET PROTECTION
NO SCALE
1
15B



ANCHOR DETAIL (PLAN VIEW)
OVERLAPPING JOINT
NO SCALE
2
15B



STAKE DETAIL
NO SCALE
3
15B



CURLEX® SEDIMENT LOG®
CURB INLET PROTECTION
NO SCALE
4
15B

American Excelsior Company®
Earth Science Division

AMERICAN EXCELSIOR COMPANY ARLINGTON, TEXAS	SHEET DESCRIPTION CURLEX® SEDIMENT LOG® BIO INLET PROTECTION DETAIL	DATE 02/22/21	DRAWN BY	
		SCALE NONE	PROJECT NO.	SHEET NO. 15B

Curlex® Sediment Logs®

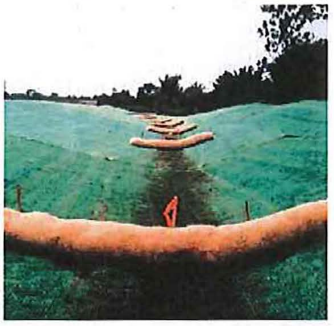
Excelsior Sediment Control Device

Product Description

Curlex Sediment Logs use excelsior fibers to reduce hydraulic energy & filter sediment-laden runoff. Tired of straw and hay bale checks being blown out and the fibers washed downstream to clog the nearest outlet? Fed up with spending all of your time and effort installing silt fence only to see it get knocked down when it rains or a good wind comes along? How about when you have to go back and pick up the loose fibers and/or remove those worn out silt fences and take them to the landfill? Next time, consider giving our Bioengineered Sediment Logs a try. Water filters through (not underneath) the diameter of the porous, interlocked fiber log matrix. As it does, velocity is naturally reduced and sediment is collected on the upstream side of the excelsior fiber log. Install Curl ex Sediment Logs over bare soil, over rolled erosion control products, on steep slopes, around inlets and outlets, or around jobsites for perimeter control.

Material Characteristics

Sediment Logs are versatile excelsior logs comprised of an outside containment fabric that is filled with unique Curlex fibers. Curlex fibers are made of Great Lakes Aspen excelsior fibers. The fibers are curled with soft interlocking barbs and 80% will be six inches in length or longer. The outside, open weave containment fabric is degradable, thus Sediment Logs will degrade in place if not removed. Sediment Logs are porous, allowing water to pass through the excelsior matrix, progressively slowing velocity and filtering sediment as it passes through the log diameter. Sediment Logs are extremely flexible and contour to the terrain to maintain intimate contact with the subgrade. In addition, they come with five other benefits; lightweight, no trenching, no seeds, no disposal hassle, and they may be reusable depending on the application.



Performance Capabilities

Product Names / Nominal Diameters

Type I - (20 in) energy dissipation in heavy duty concentrated flow areas, slope interruption, inlet protection, perimeter control
Type II - (12 in) energy dissipation in mild to medium concentrated flow areas, slope interruption, inlet protection, perimeter control
Type III - (9 in) energy dissipation in mild concentrated flow areas, slope interruption, inlet protection, perimeter control
Type IV - (6 in) energy dissipation in low concentrated flow areas, slope interruption, inlet protection, perimeter control

Typical Applications

- Ditch bottoms, swales, and waterways
- Over bare soils and/or temporary & turf reinforcement blankets
- Drop structures and let down structures
- 360 degree protection around catch basins & drop inlet structures
- Curb & drainage outlets
- Project ingress & egress termination points
- As wattles on steep slopes
- Site perimeter control
- Use in place of bales, silt fence, reinforced silt fence, and rock checks

American Excelsior Company®
Earth Science Division
Arlington, Texas (800) 777-SOIL • www.curlex.com

MADE IN THE U.S.A.

American Excelsior Company®
Earth Science Division

Curlex® Sediment Log®

Excelsior Sediment Control Device

SUGGESTED SPECIFICATIONS

General

Sediment Log consists of an outside, open weave, containment fabric filled with Great Lakes Aspen curled excelsior fibers. Its purpose is to provide a flexible, lightweight, porous, sediment control device demonstrating the ability to conform to terrain details, dissipate water velocity, and filter contaminated flows.

Product

Sediment Control Device shall be Curlex Sediment Log, as manufactured by American Excelsior Company. Curlex Sediment Logs shall be made of Great Lakes Aspen Excelsior fibers encased in an outside, open weave containment fabric secured on each end. Fibers shall be curled with soft, interlocking barbs to form a strong, organic filtration matrix. A minimum of 80 percent of the fibers shall be 15 cm (6 in) or greater in length. Fibers shall be evenly distributed throughout the diameter and length of the Sediment Log. Excelsior fibers shall be seed free. Density of sediment logs shall not exceed 2.6 lb/ft^3 to ensure necessary flow rates for filtering. Curlex Sediment Log shall be manufactured in the U.S.A. at company locations where QA/QC is implemented and managed by the manufacturer. Field fabricated products and products made by anyone other than the manufacturer (i.e. distributors, dealers, etc.) shall not be accepted.

	TYPE I*	TYPE II*	TYPE III*	TYPE IV*
Product Name/Nominal Diameter	20 in	12 in	9 in	6 in
Length (±10%)	3.05 m (10 ft)	3.05 m (10 ft)	7.62 m (25 ft)	7.62 m (25 ft)
Weight (±10%)**	13.62 kg (30 lb)	9.02 kg (20 lb)	11.35 kg (25 lb)	5.45 kg (12 lb)
Net opening (hexagonal-shaped)	3.2 cm (1.3 in)	2.5 cm (1 in)	1.9 cm (.75 in)	1.3 cm (.5 in)

*Custom sizes available

**Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen Excelsior is 22%.

Performance Requirements

Slope Erosion*:	Reduce by a minimum of 70% of bare soil slopes
Channel Erosion**:	Reduce by a minimum of 50% of bare soil channels
pH Absorption***:	Ending pH shall not exceed 8.3
Functional Longevity****:	⩽ 24 months
Oil Sorbent Material:	U.S. E.P.A. documentation for preapproval

*Based on large-scale rainfall testing as outlined in Kelsey, K., T. Johnson, and R. Vavra. 2006. "Needed Information: Testing, Analyses, and Performance Values for Slope Interruption and Perimeter Control BMPs." IECA Conference Proceedings. P. 171-181.

**Based on ASTM D7208

***Based on ASTM D1117, modified

****Functional Longevity varies from region to region because of differences in climatic conditions.

Curlex Sediment Logs Design Values With Comparisons To Typical Straw Wattles

	Channel Design			Slope Design	
Product Name/ Nominal Diameter	Density* (lb/ft3)	GPM/ft2**	GPM/linear ft of installed product	P Factor*** (event-based)	% Soil Retained
6" Curlex Sediment Log	2.4	42.5	19.5	0.461	53.9
9" Straw Wattle	4.5	7.5	5.6	0.676	32.4
9" Curlex Sediment Log	2.3	42.5	29.0	0.461	53.9
12" Straw Wattle	3.8	8.0	8.0	0.828	17.2
12" Curlex Sediment Log	2.5	40.0	36.7	0.297	70.3
20" Curlex Sediment Log	1.4	37.5	46.9	0.297	70.3

*Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior, AEC Premier Straw, and AEC Premier Coconut fibers are 22%, 15%, and 20%, respectively.

**Based on ASTM D5141.

***Based on large-scale simulated rainfall testing.

MADE IN THE U.S.A.

If you would like to receive more information or consult with one of our Customer Care Center Specialists, please call us toll free at (888-352-9582)

PDF download specifications available in the Technical Support Library at www.curlex.com

Special Specification

Erosion Eels™

1. Description. Furnish, install, maintain, and remove Erosion Eels™ as shown on plans or as directed.

2. Materials.

1. **Core Material.** Erosion Eels™ shall consist of core, internal filter materials comprised of one of two mixtures:

   I. **Mixture Specification 1.0.** A filter mixture comprised of 100% shredded rubber that has been washed and processed to remove most, if not all, metal components. The material shall be derived from recycled tires and shall be shredded to produce a maximum particle size of +/- ¾ inch.
   II. **Mixture Specification 2.0.** A filter mixture comprised of 100% shredded rubber that has been washed and processed to remove most, if not all, metal components. The material shall be derived from recycled tires and shall be shredded to produce a maximum particle size of +/-2-inches.

2. **Containment Material.** The containment material for the filter core particles shall be a woven, polypropylene geotextile with UV-stabilizers and inert to biological decay and chemically resistant to naturally occurring chemicals, alkalis, and acids. Minimum fabric permeability shall be equal to or greater than 0.05 cm/sec per ASTM D 4491. Minimum strength retained relative to UV exposure shall be 70% when tested per ASTM D 4355 for 500 hours.

3. **Size.** Erosion Eels™ shall be produced with a nominal diameter of +/-9.5 inches and +/-20 inches and standard nominal lengths of +/-4.5 feet and +/-10 feet.

3. Construction. Install Erosion Eels™ near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the Erosion Eels™ into the erosion control measures used to the control sediment on construction sites. Install, align, and locate the Erosion Eels™ as specified below, as shown on the plans, as direction.

A. **Stabilizing/Securing.** Secure Erosion Eels™ in a method adequate to prevent displacement as a result of normal rain events and such that flow is not allowed under the bags.
B. **Maintenance.** Inspect and maintain the Erosion Eels™ in good condition. Maintain the integrity of the control, including keeping the bags free of accumulated silt, debris, etc., until permanent erosion control features are in place, or the disturbed area has been adequately stabilized. Stabilize the areas damaged by the removal process using appropriate methods as approved. Repair or replace damaged Erosion Eels™ as required and as directed. Temporarily remove and replace Erosion Eels™ as required to facilitate work. Remove sediment and debris when accumulation affects the

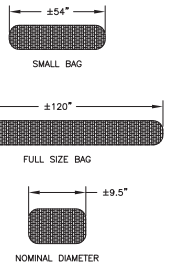
performance of the devices, after a rain, and when directed. Dispose of sediment and debris at an approved site in a manner that will not contribute to additional siltation.

C. Removal. Remove and reuse Erosion Eels™ when directed.

4. Measurement. This item will be measured by the linear foot along the centerline of the top of the control bags.

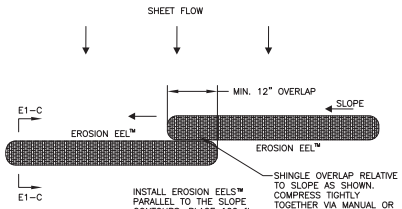
End-of Section

Note: Specifications are subject to revisions at the discretion of the Manufacturer.

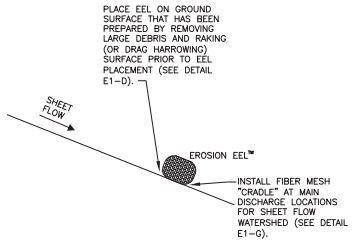


NOTE:
ALL EROSION EELS™ USED FOR PERIMETER CONTROL SHALL USE MIXTURE SPECIFICATIONS 1.1 AND 1.2.

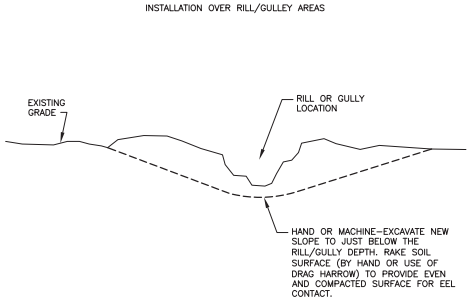
DETAIL E1–A: EROSION EELs™
N.T.S.



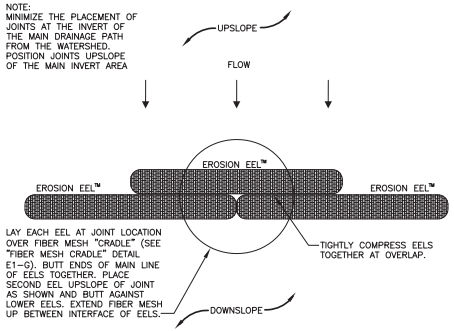
DETAIL E1–B: INTERCEPTING SHEET FLOW
PERPENDICULAR TO FLOW PATH – PLAN VIEW



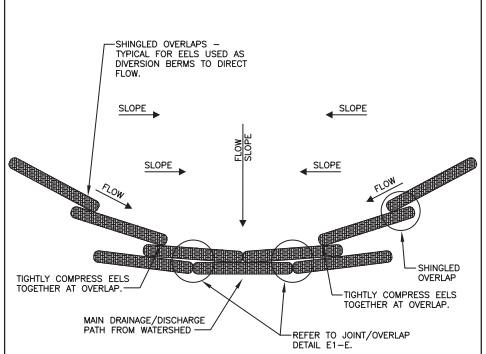
DETAIL E1–C: INTERCEPTING SHEET FLOW
PERPENDICULAR TO FLOW PATH – PLAN VIEW



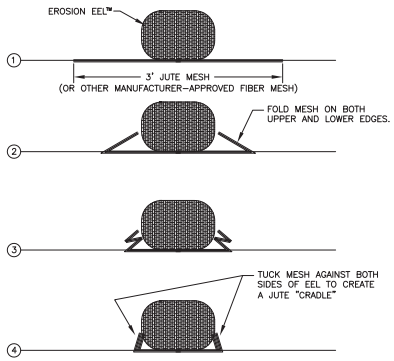
DETAIL E1–D: CROSS–SECTION VIEW
N.T.S.



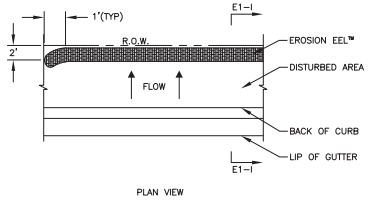
DETAIL E1–E: PLAN VIEW –
OVERLAP/JOINT DETAIL NEAR DISCHARGE POINTS FROM WATERSHED
N.T.S.



DETAIL E1–F: PLAN VIEW – TYPICAL
ARRANGEMENT OF EELS USED FOR PERIMETER CONTROL
N.T.S.

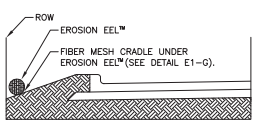


DETAIL E1–G: SECTION – FIBER MESH "CRADLE"
N.T.S.

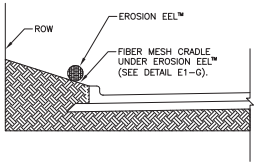


PLAN VIEW

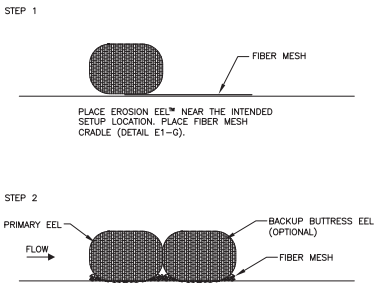
DETAIL E1–H: EROSION EEL™
PLACED AT EDGE OF ROADWAY RIGHT–OF–WAY
N.T.S.



DETAIL E1–I: SECTION
N.T.S.



DETAIL E1–J: SECTION
N.T.S.



DETAIL E1–K: STABILIZING PROCEDURE FOR
EROSION EEL PLACED OVER HARD SURFACE (PAVED, ROCK, ETC.)
N.T.S.

Spacing Recommendations for the Erosion Eel™ for Perimeter Controls and Intercepting Sheet Flow on Slopes

slope(%)	single eel spacing (ft)	*Stacked Dual eel spacing (ft)
0.5	300	N/A
1	200	N/A
2	160	N/A
3	80	N/A
4	50	N/A
5	40	N/A
6	35	N/A
8	30	N/A
10	25	N/A
15	17	N/A
20	12	25
25	7	15
33	N/A	10
50	N/A	6

* DUAL STACK REFERS TO TWO EELS STACKED ATOP ONE ANOTHER AND STABILIZED WITH T–POSTS. SEE DETAIL E2–E ON SHEET E–2.

GENERAL NOTES:

1. EROSION EELS™ USED IN PERIMETER CONTROL APPLICATIONS SHALL HAVE A SPECIFICATION MIXTURE 1.1 OR 1.2.
   a. MIXTURE SPECIFICATION 1.1. A FILTER MIXTURE COMPRISED OF 50% SHREDDED RUBBER AND 50% WOOD CHIP PARTICLES BY VOLUME. THE SHREDDED RUBBER SHALL BE WASHED AND PROCESSED TO REMOVE MOST, IF NOT ALL, METAL COMPONENTS. THE RUBBER SHALL BE DERIVED FROM RECYCLED TIRES AND SHALL BE SHREDDED TO PRODUCE A MAXIMUM PARTICLE SIZE OF +/– 3/4 INCH. THE WOOD CHIPS SHALL BE PRODUCED FROM HARDWOOD TREES AND SHALL CONFIRM TO AASHTO CERTIFICATION SPECIFICATION MP 9–03.
   b. MIXTURE SPECIFICATION 1.2. A FILTER MIXTURE COMPRISED OF 1/3 SHREDDED RUBBER, 1/3 WOOD CHIPS, AND 1/3 RECYCLED SYNTHETIC FIBERS. THE SHREDDED RUBBER SHALL BE WASHED AND PROCESSED TO REMOVE MOST, IF NOT ALL, METAL COMPONENTS. THE RUBBER SHALL BE DERIVED FROM RECYCLED TIRES AND SHALL BE SHREDDED TO PRODUCE A MAXIMUM PARTICLE SIZE OF +/– 3/4 INCH. THE WOOD CHIPS SHALL BE PRODUCED FROM HARDWOOD TREES AND SHALL CONFIRM TO AASHTO CERTIFICATION SPECIFICATION MP 9–03. THE SYNTHETIC FIBERS SHALL BE PRODUCED FROM RECYCLED, MANUFACTURED MATERIALS, SUCH AS, BUT NOT LIMITED TO, PRE–CONSUMER SCRAP CARPET, TIRE CHORD, AND TIRE FIBER MATERIALS.
2. EROSION EELS™ SHALL BE MANUFACTURED FROM A WOVEN GEOTEXTILE COVERING WITH INTERIOR FILTER MATERIALS SUCH AS 100% SHREDDED RUBBER (MIXTURE SPECIFICATION 1.0, 50% SHREDDED RUBBER/50% AASHTO–CERTIFIED WOOD CHIPS (MIXTURE SPECIFICATION 1.1), OR 1/3 SHREDDED RUBBER:1/3 AASHTO–CERTIFIED WOOD CHIPS:1/3 RECYCLED SYNTHETIC FIBERS (MIXTURE SPECIFICATION 1.2).
3. LENGTHS OF EROSION EELS™ SHALL BE EITHER A NOMINAL +/–10 FT. OR +/– 4.5 FT. NOMINAL DIAMETER SHALL BE +/–9.5 INCHES.
4. EROSION EELS™ CAN BE PLACED AT THE TOP, ON THE FACE, OR AT THE TOE OF SLOPES TO INTERCEPT RUNOFF, REDUCE FLOW VELOCITY, RELEASE THE RUNOFF AS SHEET FLOW AND PROVIDE REMOVAL OF SEDIMENT FROM THE RUNOFF.
5. EROSION EELS™ SHALL BE INSTALLED ALONG THE GROUND CONTOUR, AT THE TOE OF SLOPES, AT AN ANGLE TO THE CONTOUR TO DIRECT FLOW AS A DIVERSION BERM, AROUND INLET STRUCTURES, IN A DITCH AS A CHECK DAM TO HELP REDUCE SUSPENDED SOLIDS LOADING AND RETAIN SEDIMENT, OR AS A GENERAL FILTER FOR ANY DISTURBED SOIL AREA.
6. NO TRENCHING IS REQUIRED FOR INSTALLATION OF EROSION EELS™
7. PREPARE BED FOR EEL INSTALLATION BY REMOVING ANY LARGE DEBRIS INCLUDING ROCKS, SOIL CLODS, AND WOODY VEGETATION. EROSION EELS™ CAN ALSO BE PLACED OVER PAVED SURFACES INCLUDING CONCRETE AND ASPHALT WITH NO SURFACE PREPARATION REQUIRED.
8. RAKE BED AREA WITH A HAND RAKE OR BY DRAG HARROW.
9. DO NOT PLACE EEL DIRECTLY OVER RILL AND GULLIES UNTIL AREA HAS BEEN HAND–EXCAVATED AND RAKED TO PROVIDE A LEVEL BEDDING SURFACE. ALL SURFACES SHALL BE UNIFORMLY COMPACTED FOR MAXIMUM SEATING OF EELS IN PLACE.
10. FOR LOCATIONS WHERE EELS WILL BE PLACED IN CONCENTRATED FLOWS (SUCH AS CHECK DAMS, INLET PROTECTION) AND FOR PERIMETER CONTROLS AT PRIMARY DISCHARGE LOCATIONS, BED THE EELS IN A JUTE MESH CRADLE PER THE DETAILED DRAWINGS.
11. FOR DITCH APPLICATIONS, THE MAXIMUM DRAINAGE AREA SHALL BE 10 ACRES.
12. IF MORE THAN ONE EROSION EEL™ IS PLACED IN A ROW, THE EELS SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES TO PREVENT FLOW AND SEDIMENT FROM PASSING THROUGH THE FIELD JOINT. COMPRESS THE TWO EELS OF THE OVERLAP TIGHTLY TOGETHER EITHER BY HAND OR MANUFACTURER–APPROVED MECHANIZED MEANS.
13. WHEN USED IN DITCHES AS A CHECK DAM, EROSION EELS™ SHALL BE INSTALLED PER MANUFACTURER'S DETAILS.
14. FOR CHECK DAM APPLICATIONS, EROSION EELS™ SHALL BE PLACED PERPENDICULAR TO THE FLOW OF THE WATER. EROSION EELS™ SHALL CONTINUE UP THE SIDES SLOPES A MINIMUM OF 3 FEET ABOVE THE DESIGN FLOW DEPTH.
15. EROSION EELS™ SHALL REMAIN IN PLACE UNTIL FULLY ESTABLISHED VEGETATION HAS COMPLETELY DEVELOPED OR UNTIL THE STORAGE CAPACITY/FUNCTIONAL LIFE OF THE EEL HAS BEEN EXHAUSTED (REQUIRING REPLACEMENT WITH NEW EELS).
16. ANCHORING POSTS FOR CHECK DAM APPLICATIONS SHALL HAVE A MINIMUM WEIGHT OF 1.25 LBS/FT STEEL T–POSTS (5 TO 7 FT. LENGTHS) ROLLED FROM HIGH CARBON STEEL. POSTS SHOULD BE HOT–DIP GALVANIZED OR COATED WITH A WEATHER–RESISTANT PAINT FOR STEEL APPLICATION. POSTS SHOULD BE EQUIPPED WITH A METAL ANCHOR PLATE. INSTALL PER DETAILS ON THIS SHEET.
17. PLACE T–POSTS THROUGH HANDLE OF BAGS. DO NOT DRIVE POSTS THROUGH EROSION EELS™. T–POSTS ARE TO BE EMBEDDED A MINIMUM OF 2 FT INTO GROUND.

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
1		
2		
3		
4		
5		

Authorized Use:
☐ Survey ☐ Design Dev. ☐ Permitting ☐ Bidding ☐ Construction ☐ -

ErosionEels.com 866-429-EELS 866-429-3357

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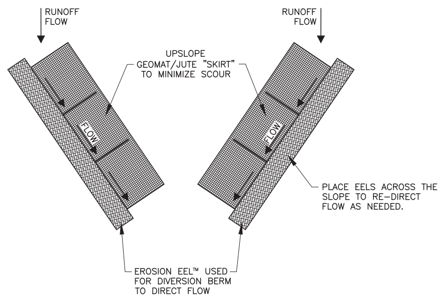
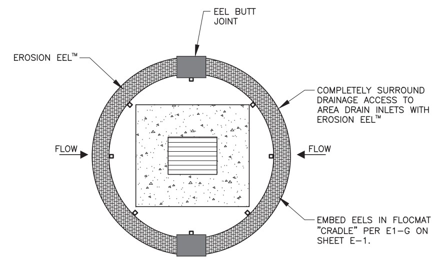
100 PRINCE STREET
SHELBYVILLE, TENNESSEE 37160
1–931–607–5953

PERIMETER CONTROL AND SHEET (INTER-RILL) FLOW INTERCEPTION FOR THE EROSION EEL™

SHEET OF
DWG NO: E-1
LAST EDIT DATE: JUNE 7, 2007 DRAWN BY: MJ
DWG SCALE: N.T.S. CHECKED BY: KW
PROJECT NO:
DRAFT MANAGER APPROVAL: KW

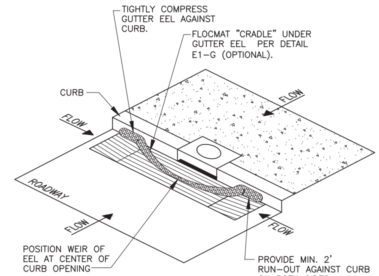


DETAIL E3-A: PLAN VIEW – EELS USED AS DIVERSION BERMS
N.T.S.



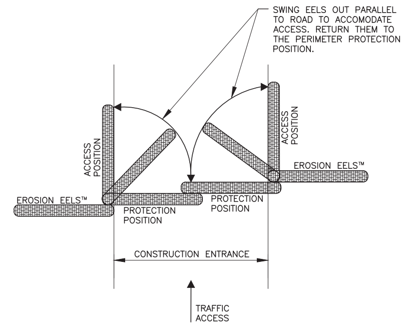
NOTE:
PERIODIC MAINTINENCE SHALL INCLUDE CLEANING EEL SURFACE WITH HIGH PRESSURE WASH OR BRUSHING SURFACE WITH BROOM.

DETAIL E3-B: INLET SEDIMENT TRAP
N.T.S.

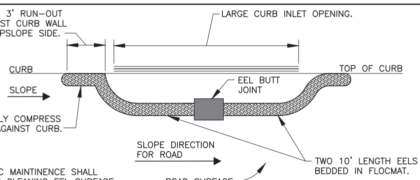


NOTE:
PERIODIC MAINTINENCE SHALL INCLUDE CLEANING GUTTER EEL SURFACE WITH HIGH PRESSURE WASH OR BRUSHING SURFACE WITH BROOM.

ISOMETRIC DETAIL E3-C: SMALL CURB INLET SEDIMENT TRAP – GUTTER EEL
N.T.S.

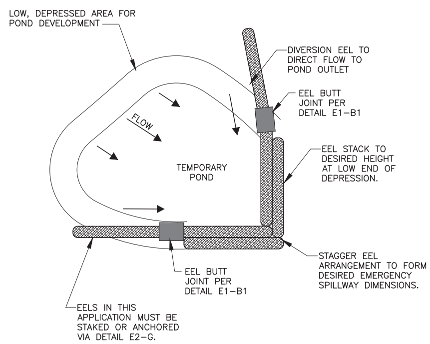


DETAIL E3-D: PLAN VIEW – TEMPORARY CONSTRUCTION ACCESS
N.T.S.

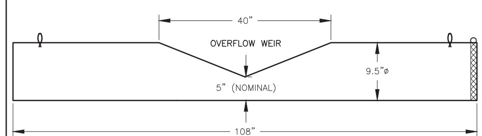


NOTE:
PERIODIC MAINTINENCE SHALL INCLUDE CLEANING EEL SURFACE WITH HIGH PRESSURE WASH OR BRUSHING SURFACE WITH BROOM.

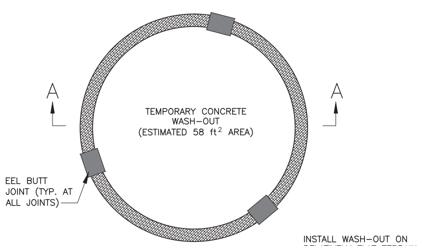
DETAIL E3-E: PLAN VIEW – LARGE CURB INLET (GUTTER EEL)
N.T.S.



DETAIL E3-F: PLAN VIEW – TEMPORARY DETENTION POND
N.T.S.

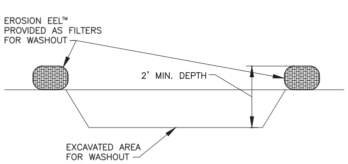


GUTTER EEL
N.T.S.

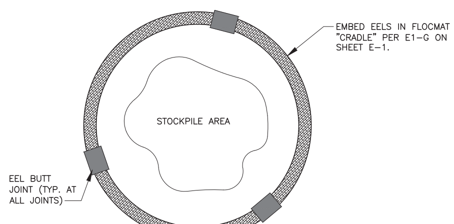


INSTALL WASH-OUT ON RELATIVELY FLAT TERRAIN. PLACE THREE EROSION EELS™ IN CIRCULAR PATTERN AS SHOWN. PROVIDE MORE EELS TO BROADEN CIRCUMFERENCE FOR LARGER WASHOUTS, IF DESIRED.

DETAIL E3-G: PLAN VIEW – TEMPORARY CONCRETE WASH-OUT
N.T.S.

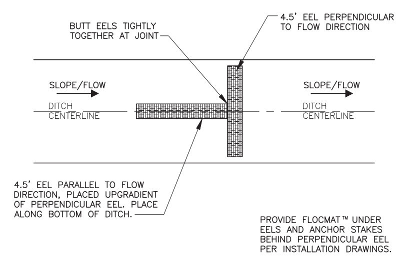


SECTION A FOR DETAIL E3-H: TEMPORARY CONCRETE WASHOUT
N.T.S.



INSTALL STOCKPILE ON RELATIVELY FLAT TERRAIN. PLACE THREE EROSION EELS™ IN CIRCULAR PATTERN AS SHOWN. PROVIDE MORE EELS TO BROADEN CIRCUMFERENCE FOR LARGER STOCKPILES, IF DESIRED.

DETAIL E3-I: PLAN VIEW – TEMPORARY STOCKPILE AREAS
N.T.S.



DETAIL E3-J: PLAN VIEW – "CROSS-CHECK" DAM ARRANGEMENT FOR SMALL V-DITCH APPLICATIONS
N.T.S.

GENERAL NOTES

1. EROSION EELS™ SHALL BE MANUFACTURED FROM A WOVEN GEOTEXTILE COVERING WITH INTERIOR FILTER MATERIALS.
2. LENGTHS OF EROSION EELS™ SHALL BE EITHER A NOMINAL +/–10 FT. OR +/– 4.5 FT. NOMINAL DIAMETER SHALL BE +/–9.5 INCHES OR +/– 20 INCHES.
3. EROSION EELS™ CAN BE PLACED AT THE TOP, ON THE FACE, OR AT THE TOE OF SLOPES TO INTERCEPT RUNOFF, REDUCE FLOW VELOCITY, RELEASE THE RUNOFF AS SHEET FLOW AND PROVIDE REMOVAL OF SEDIMENT FROM THE RUNOFF.
4. EROSION EELS™ SHALL BE INSTALLED ALONG THE GROUND CONTOUR, AT THE TOE OF SLOPES, AT AN ANGLE TO THE CONTOUR TO DIRECT FLOW AS A DIVERSION BERM, AROUND INLET STRUCTURES, IN A DITCH AS A CHECK DAM TO HELP REDUCE SUSPENDED SOLIDS LOADING AND RETAIN SEDIMENT, OR AS A GENERAL FILTER FOR ANY DISTURBED SOIL AREA.
5. NO TRENCHING IS REQUIRED FOR INSTALLATION OF EROSION EELS™.
6. PREPARE BED FOR EEL INSTALLATION BY REMOVING ANY LARGE DEBRIS INCLUDING ROCKS, SOIL CLODS, AND WOODY VEGETATION. EROSION ELLS™ CAN ALSO BE PLACED OVER PAVED SURFACES INCLUDING CONCRETE AND ASPHALT WITH NO SURFACE PREPARATION REQUIRED.
7. RAKE BED AREA WITH A HAND RAKE OR BY DRAG HARROW.
8. DO NOT PLACE EEL DIRECTLY OVER RILL AND GULLIES UNTIL AREA HAS BEEN HAND–EXCAVATED AND RAKED TO PROVIDE A LEVEL BEDDING SURFACE. ALL SURFACES SHALL BE UNIFORMLY COMPACTED FOR MAXIMUM SEATING OF EELS IN PLACE.
9. FOR LOCATIONS WHERE EELS WILL BE PLACED IN CONCENTRATED FLOWS (SUCH AS CHECK DAMS, INLET PROTECTION) AND FOR PERIMETER CONTROLS AT PRIMARY DISCHARGE LOCATIONS, BED THE EELS IN A JUTE MESH CRADLE PER THE DETAILED DRAWINGS.
10. IF MORE THAN ONE EROSION EEL™ IS PLACED IN A ROW, THE EELS SHALL BE JOINED PER DETAIL E1–B1.
11. FOR CHECK DAM APPLICATIONS, EROSION EELS™ SHALL BE PLACED PERPENDICULAR TO THE FLOW OF THE WATER. EROSION EELS™ SHALL CONTINUE UP THE SIDES SLOPES A MINIMUM OF 3 FEET ABOVE THE DESIGN FLOW DEPTH.
12. EROSION EELS™ SHALL REMAIN IN PLACE UNTIL FULLY ESTABLISHED VEGETATION HAS COMPLETELY DEVELOPED OR UNTIL THE STORAGE CAPACITY/FUNCTIONAL LIFE OF THE EEL HAS BEEN EXHAUSTED (REQUIRING REPLACEMENT WITH NEW EELS).
13. ANCHORING POSTS FOR CHECK DAM APPLICATIONS SHALL HAVE A MINIMUM WEIGHT OF 1.25 LBS/FT STEEL T–POSTS (5 TO 7 FT. LENGTHS) ROLLED FROM HIGH CARBON STEEL. POSTS SHOULD BE HOT–DIP GALVANIZED OR COATED WITH A WEATHER–RESISTANT PAINT FOR STEEL APPLICATION. POSTS SHOULD BE EQUIPPED WITH A METAL ANCHOR PLATE. INSTALL PER DETAILS ON THIS SHEET.
14. PLACE T–POSTS BEHIND EELS. DO NOT DRIVE POSTS THROUGH EROSION EELS™. T–POSTS ARE TO BE EMBEDDED A MINIMUM OF 2FT. TO 3 FT. INTO GROUND.

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION

Authorized Use:
- ☐ Survey
- ☐ Design Dev.
- ☐ Permitting
- ☐ Bidding
- ☐ Construction
- ☐ .

FRIENDLY ENVIRONMENT
100 PRINCE STREET
SHELBYVILLE, TENNESSEE 37160
1-931-607-5953

CHECK DAMS (CONTINUED), DIVERSION BERM, INLET PROTECTION, PONDS, AND CONCRETE WASHOUT DETAILS FOR THE EROSION EEL™

NOTE: DRAWINGS SUBJECT TO REVISIONS AT DISCRETION OF MANUFACTURER

LAST EDIT DATE: June 03, 2013	DRAWN BY: LM		
DWG SCALE: N.T.S.	CHECKED BY: KW		
PROJECT NO: 060-925			
QUALITY MANAGER APPROVAL:			

SHEET OF
DWG NO.: E-3

1-2

filtrexx®
SUSTAINABLE TECHNOLOGIES

SWPPP CUT SHEET

Filtrexx® Inlet Protection (SiltSoxx™)

SECTION 1: PURPOSE & DESCRIPTION

Filtrexx® SiltSoxx™ is a three-dimensional tubular sediment control and stormwater runoff filtration device typically used for storm drain **Inlet Protection** of sediment and soluble pollutants (such as phosphorus and petroleum hydrocarbons) on and around construction activities.

SECTION 2: MATERIAL & APPLICATION

Drain inlets are located in areas that receive runoff from surrounding lands, often exposed and disturbed soils, and are located at a low point, or in a sump. Inlet protection used around drain inlets (or *rain* inlet protection) should completely enclose the circumference of the drain and where possible should not be placed on a grade or slope. Inlet protection used around drain inlets should never be the only form of site sediment control and should be accompanied by erosion control/slope stabilization practices, such as compost erosion control blankets or rolled erosion control blankets. Inlet protection should never be placed where they divert runoff flow from the drain inlet, or on top of the inlet, which can cause flooding. Under high runoff and sediment loading conditions placement of 1-2 in (25-50 mm) diameter rock (AASHTO #2) may be placed around the outer circumference of the inlet protection up to ½ the height of the inlet protection. This will help slow runoff velocity as it contacts the inlet protection and will reduce sediment build-up and clogging of the inlet protection.

Curb inlets are generally located on paved surfaces and are designed to rapidly drain storm runoff from roadways to prevent flooding that poses a hazard to vehicular traffic. Inlet protection devices should be placed in a manner which intercepts runoff prior to entering the inlet, but does not block or divert runoff from the inlet. To prevent diversion of runoff, inlet protection used around curbs (or *curb* inlet protection) should be used in low points, or sumps, and minor slopes or grades. Inlet protection should never be placed in or on the curb inlet drain, or placed in a manner that obstructs vehicular traffic. Inlet protection height should be at least 1 in (25 mm) lower than top of curb inlet to allow for overflow into the drain and not over the curb. Maximum sediment removal efficiency occurs when minor ponding exists behind inlet protection but should never lead to flooding.

Curb sediment containment systems are used to reduce the sediment and pollutant load flowing to a curb inlet. They are generally placed on paved surfaces perpendicular to runoff flow and should be lower than the height of the curb. Curb sediment containment systems should never cause flooding or placed where they are a hazard to vehicular traffic. Inlet protection used for curb sediment containment (or *curb sediment containment* inlet protection) can be placed on a grade but should never be placed directly upslope from curb inlet where it may inadvertently divert runoff from entering curb inlet.

SECTION 3: INSTALLATION

1. Inlet protection used to reduce sediment and soluble pollutants entering storm drains shall meet Filtrexx® Soxx™ Material specifications and use Filtrexx® Certified℠ FilterMedia™.
2. Contractor is required to be a Filtrexx Certified Installer as determined by Filtrexx International. Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (Call Filtrexx at 877-542-7699 for a current list of installers). Look for the Filtrexx Certified Installer Seal.
3. Inlet protection shall be placed at locations indicated on plans as directed by the Engineer. Inlet protection should be installed in a pattern that allows complete protection of the inlet area.
4. Installation of curb inlet protection will ensure a minimal overlap of at least 1 ft (300mm) on either side of the opening being protected. Inlet protection will be anchored to the soil behind the curb using staples, stakes or other devices capable of holding the inlet protection in place.
5. Standard inlet protection for curb inlet protection and curb sediment containment will use 8 in

(200mm) diameter inlet protection, and drain inlets on soil will use 12 in (300mm) or 18 in (450mm) diameter inlet protection. In severe flow situations, larger inlet protection may be specified by the Engineer. During curb installation, inlet protection shall be compacted to be slightly shorter than curb height.

6. If inlet protection becomes clogged with debris and sediment, they shall be maintained so as to assure proper drainage and water flow into the storm drain. In severe storm events, overflow of the inlet protection may be acceptable in order to keep the area from flooding.
7. Curb and drain inlet protection shall be positioned so as to provide a permeable physical barrier to the drain itself, allowing sediment to collect on the outside of the inlet protection.
8. For drains and inlets that have only curb cuts, without street grates, a spacer is required in order to keep the inlet protection away from the drain opening. This spacer should be a hog wire screen bent to overlap the grate opening and keep the sock from falling into the opening. Use at least one spacer for every 4 ft (1.2m) of curb drain opening. The wire grid also prevents other floatable waste from passing over the inlet protection.
9. Stakes shall be installed through the middle of the drain inlet protection on 5 ft (1.5m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) wooden stakes.
10. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.

SECTION 4: INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Inlet protection should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional inlet protection may be required or sediment removal may be necessary. Inlet protection shall be inspected until contributing drainage area has been permanently stabilized and construction activity has ceased.

1. The Contractor shall maintain the inlet protection in a functional condition at all times and it shall be routinely inspected.
2. If the inlet protection has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the inlet protection when accumulation has reached 1/2 of the effective height of the inlet protection, or as directed by the Engineer. Alternatively, for drain inlet protection, a new Soxx may be placed on top of the original increasing the sediment storage capacity without soil distbance.
4. Inlet protection shall be maintained until disturbed area above or around the device has been permanently stabilized and construction activity has ceased.
5. Regular maintenance includes lifting the inlet protection and cleaning around and under them as sediment collects.
6. The FilterMedia will be removed from paved areas or dispersed on site soil or behind curb once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
7. Permanent vegetated filter strips will be left intact.

ADDITIONAL INFORMATION

For other references on this topic, including additional research reports and trade magazine and press coverage, visit the Filtrexx website at www.filtrexx.com

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Call for complete list of international installers.

1.2

filtrexx® SUSTAINABLE TECHNOLOGIES

SECTION 1: CONSTRUCTION

Filtrexx® Inlet Protection (SiltSoxx™)

SECTION 1: PURPOSE & DESCRIPTION

Filtrexx® SiltSoxx™ is a three-dimensional tubular sediment control and stormwater runoff filtration device typically used for storm drain **Inlet Protection** of sediment and soluble pollutants (such as phosphorus and petroleum hydrocarbons) on and around construction activities. Inlet Protection traps sediment and soluble pollutants by *filtering* runoff water as it passes through the matrix of the Soxx™ *and* by allowing water to temporarily pond behind the Soxx, allowing *deposition* of suspended solids.

SECTION 2: MATERIAL & APPLICATION

Inlet protection has three distinct applications:

- around *drain inlets*,
- in front of *curb inlets*,
- as *curb sediment containment* systems

These applications are described in detail below and shown graphically in Figure 2.1 and 2.2.

Drain inlets are located in areas that receive runoff from surrounding lands, often exposed and disturbed soils, and are located at a low point, or in a sump. Inlet protection used around drain inlets (or *rain* inlet protection) should completely enclose the circumference of the drain and where possible should not be placed on a grade or slope. Inlet protection used around drain inlets should never be the only form of site sediment control and should be accompanied by erosion control/slope stabilization practices, such as compost erosion control blankets or rolled erosion control blankets. Inlet protection should never be placed where they divert runoff flow from the drain inlet, or on top of the inlet, which can cause flooding. Under high runoff and sediment loading conditions placement of 1-2 in (25-50 mm) diameter rock (AASHTO #2) may be placed around the outer circumference of the inlet protection up to ½ the height of the inlet protection. This will help slow runoff velocity as it contacts the inlet protection and will reduce sediment build-up and clogging of the inlet protection.

Curb inlets are generally located on paved surfaces and are designed to rapidly drain storm runoff from roadways to prevent flooding that poses a hazard to vehicular traffic. Inlet protection devices should be placed in a manner which intercepts runoff prior to entering the inlet, but does not block or divert runoff from the inlet. To prevent diversion of runoff, inlet protection used around curbs (or *curb* inlet protection) should be used in low points, or sumps, and minor slopes or grades. Inlet protection should never be placed in or on the curb inlet drain, or placed in a manner that obstructs vehicular traffic. Inlet protection height should be at least 1 in (25 mm) lower than top of curb inlet to allow for overflow into the drain and not over the curb. Maximum sediment removal efficiency occurs when minor ponding exists behind inlet protection but should never lead to flooding.

Curb sediment containment systems are used to reduce the sediment and pollutant load flowing to a curb inlet. They are generally placed on paved surfaces perpendicular to runoff flow and should be lower than the height of the curb. Curb sediment containment systems should never cause flooding or placed where they are a hazard to vehicular traffic. Inlet protection used for curb sediment containment (or *curb sediment containment* inlet protection) can be

Curb Inlet Protection – Fine Silts Filtration

placed on a grade but should never be placed directly upslope from curb inlet where it may inadvertently divert runoff from entering curb inlet.

ADVANTAGES AND DISADVANTAGES

Advantages

- Tubular filtration matrix allows for better trapping and removal of sediment and soluble pollutants in stormwater runoff compared to planar constructed sediment control devices, such as silt fences.
- Inlet protection can be installed on soil or paved surface conditions.
- Greater surface area contact with soil or pavement than typical sediment control devices, reducing potential for runoff to undercut the device leading to unfiltered sediment.
- No trenching is required; therefore soil is not disturbed upon installation.
- Drain inlet protection can be installed year-round in difficult soil conditions such as frozen or wet ground, and dense and compacted soils, as long as stakes can be driven.
- Inlet protection is easily implemented as a treatment in a greater treatment train approach to erosion and sediment control.
- Organic matter and humus colloids in FilterMedia have the ability to bind and adsorb phosphorus, metals, and hydrocarbons that may be in stormwater runoff.
- Microorganisms in compost FilterMedia have the ability to degrade organic pollutants and cycle captured nutrients in stormwater runoff.
- Soxx (mesh netting containment system) allows inlet protection to be placed in areas of high sheet flow and low concentrated flow.

ADVANTAGES			
	LOW	MED	HIGH
Installation Difficulty	✓		
Sediment Control			✓
Soluble Pollutant Control		✓	
Runoff Flow Control		✓	
Life Cycle Cost	✓		

- Drain inlet protection can be direct seeded at time of application to provide greater stability and filtration capability once vegetation is established, if used on soil surface.
- FilterMedia is organic and can be left on site soil after permanent stabilization is complete, to be used in landscape design and/or seeded and planted with permanent vegetation.
- FilterMedia improves existing soil structure if spread out and used as a soil amendment after construction activity is complete.
- Biodegradable inlet protection can be left on site after construction activity and may eliminate the need for removal and labor and disposal costs.
- Inlet protection is available in 8 in (200mm), 12 in (300mm), 18 in (450mm), 24 in (600mm), and 32 in (800mm) diameters.
- Inlet protection may assist in qualification for LEED® Green Building Rating and Certification credits under LEED Building Design & Construction (BD+C), New Construction v4. Awarded credits may be possible from the categories of Sustainable Sites, Water Efficiency, Materials & Resources, and Innovation. *Note: LEED is an independent program offered through the U.S. Green Building Council. LEED credits are determined on a per project basis by an independent auditing committee. Filtrexx neither guarantees nor assures LEED credits from the use of its products. LEED is a trademark of the U.S. Green Building Council.*

Disadvantages

- If filler material of inlet protection is not Filtrexx® Certified℠ FilterMedia™, hydraulic flow rate and and/or sediment and pollutant removal performance may be diminished.
- If not installed correctly, maintained or used for a purpose or intention that does not meet specifications, performance may be diminished.
- If land surface is extremely bumpy or rocky ground surface contact to drain inlet protection may be diminished thereby adversely effecting performance.
- If inlet protection is installed on a grade or slope, runoff may be diverted from drain or inlet, causing flooding downstream.
- If runoff breaches inlet protection sediment retention will be minimal.
- Incorrect installation or application may cause flooding or pose a hazard to vehicular traffic.
- Inlet protection should never be the only form of

site sediment control.
- Inlet protection should only be used in small drainage areas.

MATERIAL SPECIFICATIONS

Inlet protection use only high wear heavy duty netting materials available from Filtrexx International and are the only mesh materials accepted in creating inlet protection for any application. For Soxx™ Material Specifications see Table 2.1.

FILTERMEDIA™ CHARACTERISTICS

Inlet protection use only Filtrexx Certified FilterMedia which is a coarse composted material that is specifically designed for removal of solids and soluble pollutants from stormwater runoff. *FilterMedia can be altered or customized to target specific pollutants in runoff as approved by the Engineer or Filtrexx International.* All Filtrexx Certified FilterMedia has been third party tested and certified to meet minimum performance criteria defined by Filtrexx International. Performance parameters include hydraulic flow through rate, total solids removal efficiency, total suspended solids removal efficiency, turbidity reduction, nutrient removal efficiency, metals removal efficiency, and motor oil removal efficiency. For information on the physical and chemical properties of Certified FilterMedia refer to the Filtrexx Design Manual, Section 5.1. Look for the Filtrexx Certified FilterMedia Seal from our international network of Filtrexx Certified Installers and Manufacturers.

PERFORMANCE

Performance testing and research on sediment control has been extensive. For a summary of performance testing, research results, and design specifications see Table 2.2. For copies of publications, full reports, or Tech Link summaries contact Filtrexx International.

Successful bidders will furnish adequate research support showing their manufactured product meets or exceeds performance and design criteria outlined in this standard specification. Research or performance testing will be accepted if it meets the following criteria: conducted by a neutral third party, utilizes standard test methods reported by ASTM or referenced in a peer reviewed scientific journal, product and control treatments are tested in triplicate, performance results are reported for product and control (control should be a bare soil under the same set of environmental and experimental conditions), results are peer reviewed, results indicate a minimum 60% TSS removal efficiency and a minimum hydraulic flow through rate of 5 gpm/ft^2. Bidders shall attach a copy of the research report indicating test methodologies utilized and results.

Note: the Contractor is responsible for establishing a working erosion and sediment control system and may, with approval of the Engineer, work outside the minimum construction requirements as needed. Where the inlet protection deteriorates or fails, it shall be repaired or replaced with an effective alternative.

DESIGN CRITERIA

Inlet protection is used for curb inlet protection and curb sediment containment on paved surfaces by providing a physical barrier that reduces the rate at which sediment-laden runoff water can enter a storm drain. Inlet protection is also used around storm runoff drain inlets on soil surfaces where construction activities are ongoing and soil stabilization and erosion control measures are also employed. Inlet protection allows construction to continue while protecting storm systems from sediment overload. Inlets are normally protected until final vegetation and stabilization is complete, thereby reducing the amount of sediment reaching the storm inlets.

For most standard curb inlet protection applications, an 8 in (200mm) diameter inlet protection is recommended; for drainage inlets receiving runoff where soils are not stabilized a 12 in (300mm) or 18 in (450mm) drain inlet protection may be specified.

For engineering design details of inlet protection see Figure 2.1 and 2.2. For a summary of specifications for product/practice use, performance and design see Table 2.1 and Table 2.2.

Drain Inlet Protection

Planning:
Inlet protection should not be considered the only form of site sediment control and should be used within an overall integrated Erosion and Sediment Control or StormWater Pollution Prevention Plan. The blocking of storm drains by the use of inlet protection should be considered in the overall site planning, especially where ponding water will create disturbances.

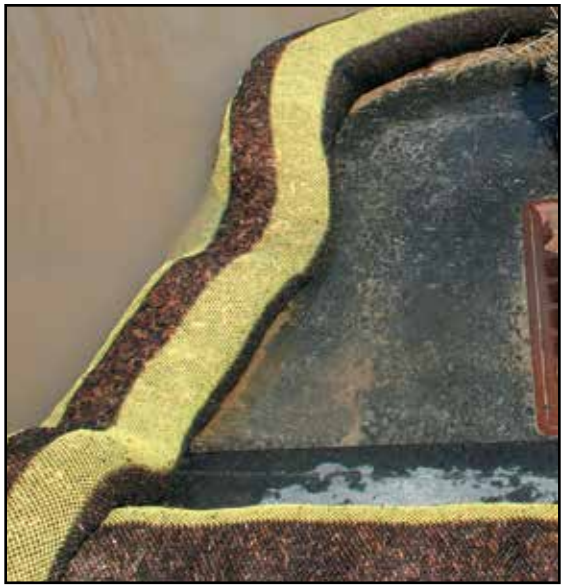
Preconstruction meetings should be conducted to educate construction site personnel about the E&SC devices used and acceptable traffic patterns that avoid running over inlet protection with heavy equipment.

It is possible to drive over inlet protection during construction (not recommended); however, these areas should be immediately repaired by manually moving inlet protection back into place, if disturbed. Continued heavy construction traffic may destroy the material fabric, reduce the dimensions, and reduce the effectiveness of the inlet protection.

Device Function:
The sediment and pollutant removal process characteristic to inlet protection combines both filtering and deposition of solids. This is different than methods that rely solely on ponding for deposition of solids for sediment control. Ponding occurs when water flowing to the inlet protection accumulates faster than the hydraulic flow through rate of the inlet protection. Typically, hydraulic flow-through rates for inlet protection are **50% greater** than geotextile filter fabric (silt fence). *Greater hydraulic flow-through rates reduce ponding, therefore reducing the need for taller sediment control structural design height*. However, installation and maintenance is especially important for proper function and performance.

Pollutant Removal:
Unlike most inlet protection devices, inlet protection has been shown to remove pollutants other than total and suspended solids from stormwater. Inlet protection has the ability to remove soluble pollutants, such as phosphorus and petroleum hydrocarbons (e.g. motor oil) from entering storm drains. Additional Filtrexx products can be added to the inlet protection to increase removal efficiency of target pollutants such as turbidity, TSS, and soluble phosphorus.

It should be noted that sediment removal efficiency can be near 100% unless runoff breaches the inlet protection, at which point the effectiveness may be greatly diminished.



Before and After Filtration

Runoff Flow:
Sheet and/or concentrated runoff flow should not exceed the hydraulic flow-through capacity, and ponding depth should not exceed the height, of the inlet protection. If overflow of the device is a possibility, larger diameter inlet protection should be specified, other sediment control devices may be used, or management practices to reduce runoff should be implemented. For curb inlets, inlet protection should not exceed the height of the intake opening. For curb sediment containment, inlet protection should not exceed the height of the curb.

Level Contour:
Place inlet protection on level contours to prevent diversion of runoff from storm inlets. Sheet flow of water should be perpendicular to the inlet protection at impact. If inlet protection is to be placed on a grade, care should be taken not to divert runoff from storm inlet.

Runoff and Sediment Accumulation:
Where possible, inlet protection used for drain inlets should be placed at a 5 ft (1.5m) or greater distance away from the toe of the slope to allow for proper runoff accumulation for sediment deposition and to allow for maximum sediment storage capacity behind the device. If a 5 ft (1.5m) distance is not available, due to construction restrictions, a second inlet protection may be installed to increase ponding and sediment accumulation capacity.

Vegetated Filter:
For permanent drain inlet applications inlet protection can be direct-seeded to allow vegetation establishment directly in the device. Vegetation on and around the inlet protection will assist in slowing runoff velocity which can increase deposition and filtration of pollutants. The option of adding vegetation will be at the discretion of the Engineer. No additional soil amendments or fertilizer are required for vegetation establishment in the drain inlet protection. The appropriate seed mix shall be determined by the Engineer. This option is not normally available when using the tool on paved areas.

Drainage Area and Spacing:
Maximum drainage area contributing runoff to drain inlet protection should be no more than 3 acres (1.2 ha). Drainage areas greater than 3 acres (1.2 ha) should implement sediment traps, sediment basins, or runoff reduction practices (KY TC, 2006).

Spacing between inlet protection used for sediment containment along curbs is dependent on the grade of the roadway and can have an effect on the total sediment load reaching the curb inlet.

SECTION 3: INSTALLATION

1. Inlet protection used to reduce sediment and soluble pollutants entering storm drains shall meet Filtrexx Soxx Material specifications and use Filtrexx Certified FilterMedia.
2. Contractor is required to be a Filtrexx Certified Installer as determined by Filtrexx International. Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (Call Filtrexx at 877-542-7699 for a current list of installers). Look for the Filtrexx Certified Installer Seal.
3. Inlet protection shall be placed at locations indicated on plans as directed by the Engineer. Inlet protection should be installed in a pattern that allows complete protection of the inlet area.
4. Installation of curb inlet protection will ensure a minimal overlap of at least 1 ft (300mm) on either side of the opening being protected. Inlet protection will be anchored to the soil behind the curb using staples, stakes or other devices capable of holding the inlet protection in place.
5. Standard inlet protection for curb inlet protection and curb sediment containment will use 8 in (200mm) diameter inlet protection, and drain inlets on soil will use 12 in (300mm) or 18 in (450mm) diameter inlet protection. In severe flow situations, larger inlet protection may be specified by the Engineer. During curb installation, inlet protection shall be compacted to be slightly shorter than curb height.
6. If inlet protection becomes clogged with debris and sediment, they shall be maintained so as to assure proper drainage and water flow into the storm drain. In severe storm events, overflow of the inlet protection may be acceptable in order to keep the area from flooding.
7. Curb and drain inlet protection shall be positioned so as to provide a permeable physical barrier to the drain itself, allowing sediment to collect on the outside of the inlet protection.
8. For drains and inlets that have only curb cuts, without street grates, a spacer is required in order to keep the inlet protection away from the drain opening. This spacer should be a hog wire screen bent to overlap the grate opening and keep the sock from falling into the opening. Use at least one spacer for every 4 ft (1.2m) of curb drain opening. The wire grid also prevents other floatable waste from passing over the inlet protection.
9. Stakes shall be installed through the middle of the drain inlet protection on 5 ft (1.5m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) wooden stakes.
10. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.

INSPECTION

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Inlet protection should be

Table 2.3 Spacing for Curb Sediment Containment Systems.

Grade (%)	Spacing (ft)	Spacing (mm)
0.5	100	30
1.0	50	15
2.0	25	8
3.0	16	5
4.0	13	4
5.0	10	3

Source: Fifield, 2001.

regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional inlet protection may be required or sediment removal may be necessary. Inlet protection shall be inspected until contributing drainage area has been permanently stabilized and construction activity has ceased.

SECTION 4: MAINTENANCE

1. The Contractor shall maintain the inlet protection in a functional condition at all times and it shall be routinely inspected.
2. If the inlet protection has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the inlet protection when accumulation has reached 1/2 of the effective height of the inlet protection, or as directed by the Engineer. Alternatively, for drain inlet protection, a new Soxx may be placed on top of the original increasing the sediment storage capacity without soil distbance.
4. Inlet protection shall be maintained until disturbed area above or around the device has been permanently stabilized and construction activity has ceased.
5. Regular maintenance includes lifting the inlet protection and cleaning around and under them as sediment collects.
6. The FilterMedia will be removed from paved areas or dispersed on site soil or behind curb once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
7. Permanent vegetated filter strips will be left intact.

DISPOSAL/RECYCLING

FilterMedia is an organic, composted product manufactured from locally generated organic, natural, and biologically based materials. Once all soil has been stabilized and construction activity has been completed, the FilterMedia may be dispersed with a loader, rake, bulldozer or similar device and may be incorporated into the soil as an amendment or left on the soil surface to aid in permanent seeding or landscaping. Leaving the FilterMedia on site reduces removal and disposal costs compared to other sediment control devices. The mesh netting material will be extracted from the FilterMedia and disposed of properly by the Contractor. The photodegradable mesh netting material (Soxx) may degrade if left on site. Biodegradable mesh netting material is available and may eliminate the need and cost of removal and disposal.

METHOD OF MEASUREMENT

Bid items shall show measurement as 'X in (X mm) Filtrexx® Inlet Protection/SiltSoxx™/InletSoxx™ per linear ft (linear meter) installed, per inlet, or as specified by the Engineer. Engineer shall notify Filtrexx of location, description, and details of project prior to the bidding process so that Filtrexx can provide design aid and technical support.

ADDITIONAL INFORMATION

For other references on this topic, including additional research reports and trade magazine and press coverage, visit the Filtrexx website at www.filtrexx.com

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REFERENCES CITED & ADDITIONAL RESOURCES

Faucette, L.B., H. Keener, and K. Kerchner, A. Vick. 2006. Sediment Storage Capacity of SiltSoxx™ vs. Silt Fence. Filtrexx® Tech Link #3314

Faucette, L.B., H. Keener, M Klingman, and K. Kerchner. 2006. Design Capacity Prediction Tool for Silt Soxx™ and Silt Fence. Filtrexx® Tech Link #3313 (description) and Filtrexx® Library #301 (design tool)

Faucette, L.B., A. Vick. 2006. LEED Green Building Credits using Filtrexx® Organic BMPs. Filtrexx® Tech Link #3301

Faucette, L.B., A. Vick, and K. Kerchner. 2006. Filtrexx®, Compost, Low Impact Development (LID), and Design Considerations for Storm Water Management. Filtrexx® Tech Link #3306

Faucette, L.B. 2006. Flow-Through Rate, Design Height, and Design Capacity of SiltSoxx™ and Silt Fence. Filtrexx® Tech Link #3304

Faucette, L.B. 2006. Design Height, Flow-Through Rate, and Slope Spacing of SiltSoxx™ and Silt Fence. Filtrexx® Tech Link #3311

Faucette, L.B., and R. Tyler. 2006. Organic BMPs used for Storm Water Management. Proceedings of the International Erosion Control Association Annual Conference, Long Beach, CA 2006.

Faucette, B, F. Shields, and K. Kurtz. 2006. Removing storm water pollutants and determining relations between hydraulic flow-through rates, pollutant removal efficiency, and physical characteristics of compost filter media. Second Interagency Conference on Research in Watersheds, 2006 Proceedings. Coweeta Hydrologic Research Station, NC. Filtrexx® Library #106.

Faucette, B., Sadeghi, A., and K. Sefton. 2006. USDA ARS - Evaluation of Compost Filter Socks and Silt Fence in Sediment and Nutrient Reduction from Runoff. Filtrexx® Tech Link #3308

Faucette L.B., C.F. Jordan, L.M. Risse, M. Cabrera, D.C. Coleman, L.T. West. 2005. Evaluation of Storm Water from Compost and Conventional Erosion Control Practices in Construction Activities. Journal of Soil and Water Conservation. 60:6:287-298.

Faucette, L.B. 2005. Removal and Degradation of Petroleum Hydrocarbons from Storm Water with Compost. Filtrexx® Tech Link #3307

Faucette, L.B. 2005. A Comparison of Performance and Test Methods of SiltSoxx™ and Silt Fence. Filtrexx® Tech Link #3302.

Faucette, L.B., N. Strazar, A. Marks. 2006. Filtrexx® Polymer and Flocculent Guide. Filtrexx® Library #601.

Fifield, J. 2001. Designing for Effective Sediment and Erosion Control on Construction Sites. Forester Press, Santa Barbara, CA.

Keener, H., B. Faucette, M. Klingman. 2006. Flow-through rates and evaluation of solids separation of compost filter media vs. silt fence in sediment control applications. 2006 American Society of Agricultural and Biological Engineers Annual International Conference, Portland, OR. Paper No. 062060.

KY TC, 2006. Kentucky Erosion Prevention and Sediment Control Field Guide. Kentucky Transportation Cabinet.

Marks, A., R. Tyler, and B. Faucette. 2005. The Filtrexx® Library. Digital publication of support tools for the erosion control industry. www.filtrexxlibrary.com.

Marks, A., and R. Tyler. 2003. Filtrexx International Company Website. Specifications, CAD drawings, case histories. www.filtrexx.com

Tyler, R.W., and A. Marks. 2004. Erosion Control Toolbox CD Kit. A Guide to Filtrexx® Products, Educational Supplement, and Project Videos. 3 CD set for Specifications and Design Considerations for Filtrexx® Products.

Tyler, R.W., J. Hoeck, and J. Giles. 2004. Keys to understanding how to use compost and organic matter. IECA Annual Meeting Presentations published as IECA Digital Education Library, Copyright 2004 Blue Sky Broadcast.

Tyler, R.W. 2004. International PCT Patent Publication #: WO 2004/002834 A2. Containment Systems, Methods and Devices for Controlling Erosion.

Tyler, R.W., A. Marks. 2003. Filtrexx® Product Installation Guide. Grafton, Ohio.

Tyler, R.W. 2003. International PCT Application #: PCTUS2003/020022. Containment Systems, Methods and Devices for Controlling Erosion.

Tyler, R.W. 2003. US Patent Publication #: 2003/0031511 A1. Devices, Systems and Methods for Controlling Erosion.

Tyler, R.W., and A. Marks. 2003. A Guide to Filtrexx® Products. Product Descriptions and Specifications for Filtrexx® Products.

Tyler, R.W. 2002. US Patent Application #10/208,631. Devices, Systems and Methods for Controlling Erosion.
Tyler, R.W. 2001. Provisional Patent Application #60/309,054. Devices, Systems and Methods for Controlling Erosion.

Tyler, R.W. 2001. Filtrexx® Product Manual. Specifications and Design Considerations for Filtrexx® Products, Grafton, OH.

Tyler, R.W. 1996. Winning the Organics Game – The Compost Marketers Handbook. ASHS Press, ISBN # 0-9615027-2-x..

Tyler, R.W. 2007. US Patent # 7,226,240 "Devices, Systems and Methods for Controlling Erosion" Issue date 6-5-07.

US EPA NPDES Phase II. 2006. Compost Filter Socks: Construction Site Storm Water Runoff Control. National Menu of Best Management Practices for Construction Sites. http://cfpub.epa.gov/npdes/stromwater/menuofbmps/con_site.cfm

TABLES & FIGURES:

Table 2.1. Filtrexx® Soxx™ Material Specifications.

Material Type	Cotton BioSoxx™	5 mil High Density Polyethylene (HDPE)	5 mil High Density Polyethylene (HDPE)	Multi-Filament Polypropylene (MFPP, previously HDPP)	Multi-Filament Polypropylene SafteySoxx™	Multi-Filament Polypropylene DuraSoxx®	Multi-Filament Polypropylene DuraSoxx® (Heavy Duty)
Material Characteristic	Biodegradable	Oxo-degradable	Photodegradable	Photodegradable	Photodegradable	Photodegradable	Photodegradable
Design Diameters	8 in (200mm), 12 in (300mm)	8 in (200mm), 12 in (300mm), 18 in (400mm)	5 in (125mm), 8 in (200mm), 12 in (300mm), 18 in (400mm)	8 in (200mm), 12 in (300mm), 18 in (400mm), 24 in (600mm), 32 in (800mm)	8 in (200mm), 12 in (300mm), 18 in (400mm)	8 in (200mm), 12 in (300mm), 18 in (400mm), 24 in (600mm), 32 in (800mm)	5 in (125mm), 8 in (200mm), 12 in (300mm), 18 in (400mm)
Mesh Opening	1/8 in (3mm)	3/8 in (10mm)	3/8 in (10mm)	3/8 in (10mm)	1/8 in (3mm)	1/8 in (3mm)	1/8 in (3mm)
Tensile Strength	44 psi (3.09 kg/cm^2)	26 psi (1.83 kg/cm^2)	26 psi (1.83 kg/cm^2)	44 psi (3.09 kg/cm^2)	202 psi (14.2 kg/cm^2)*	202 psi (14.2 kg/cm^2)	242 psi (16.99 kg/cm^2)
% Original Strength from Ultraviolet Exposure (ASTM G-155)	ND	ND	23% at 1000 hr	100% at 1000 hr	100% at 1000 hr	100% at 1000 hr	100% at 1000 hr
Functional Longevity/ Project Duration***	up to 12 months**	6 mo-3.5 yr	9 mo-4 yr	1-4 yr	2-5 yr	2-5 yr	2-5 yr

*Tested at Texas Transportation Institute/Texas A&M University (ASTM 5035-95).
** Data based on Caltrans research and specifications
*** Functional longevity ranges are estimates only. Site specific environmental conditions may result in significantly shorter or longer time periods.

Table 2.2. Filtrexx® Inlet Protection Performance and Design Specifications Summary.

Design Diameter / **Design & Performance**	**8 in (200mm)**	**12 in (300mm)**	**18 in (450mm)**	**24 in (600mm)**	**32 in (800mm)**	**Testing Lab/ Reference**	**Publication(s)**
Effective Height	6.5 in (160mm)	9.5 in (240mm)	14.5 in (360mm)	19 in (480mm)	26 in (650mm)	The Ohio State University, Ohio Agricultural Research and Development Center	Transactions of the American Society of Agricultural & Biological Engineers, 2006
Effective Circumference	25 in (630mm)	38 in (960mm)	57 in (1450mm)	75 in (1900mm)	100 in (2500mm)		
Density (when filled)	13 lbs/ft (20 kg/m)	32 lbs/ft (50 kg/m)	67 lbs/ft (100 kg/m)	133 lbs/ft (200 kg/m)	200 lbs/ft (300 kg/m)	Soil Control Lab, Inc	
Air Space	20%	20%	20%	20%	20%	Soil Control Lab, Inc	
Maximum continuous length	unlimited	unlimited	unlimited	unlimited	unlimited		
Staking Requirement	10 ft (3m)	10 ft (3m)	10 ft (3m)	10 ft (3m)	10 ft (3m)		
Maintenance Requirement (sediment accumulation removal at X height)	3.25 in (80mm)	4.75 in (120mm)	7.25 in (180mm)	9.5 in (240mm)	13 in (325mm)		

(continued on next page)

Table 2.2. Filtrexx® Inlet Protection Performance and Design Specifications Summary. *(continued)*

Design Diameter / Design & Performance	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Initial Maintenance Requirement based on Rainfall-Runoff*	22 in (55 cm); 1109 L/linear m	32 in (80 cm); 1388 L/linear m	42 in (105 cm); 1825 L/linear m	64 in (160 cm); 2776 L/linear m	86 in (215 cm); 3885 L/linear m	The University of Georgia & Auburn University	
Functional Longevity**	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr		
Maximum Slope Length (<2%)	600 ft (183m)	750 ft (229m)	1000 ft (305m)	1300 ft (396m)	1650 ft (500m)	The Ohio State University, Ohio Agricultural Research and Development Center	Filtrexx® Design Tool™, Filtrexx® Library #301, Filtrexx® Tech Link #3304 & #3311
Hydraulic Flow Through Rate	7.5 gpm/ft (94 L/min/m)	11.3 gpm/ft (141 L/min/m)	15.0 gpm/ft (188 L/min/m)	22.5 gpm/ft (281 L/min/m)	30.0 gpm/ft (374 L/min/m)	The Ohio State University, Ohio Agricultural Research and Development Center; University of Guelph, School of Engineering/ Watershed Research Group	Filtrexx® Tech Link #3311 & #3313, #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006, Second Interagency Conference on Research in Watersheds, 2006
P Factor (RUSLE)	0.1-0.32	0.1-0.32	0.1-0.32	0.1-0.32	0.1-0.32	USDA ARS Environmental Quality Lab/ University of Georgia	American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Sediment Storage Capacity***	174 cu. in (2850cc)	396 cu. in (6490cc)	857 cu. in (14040cc)	1631 cu. in (26840cc)	2647 cu. in (43377 cc)		Filtrexx® Tech Link #3314
Total Solids Removal	98%	98%	98%	98%	98%	Soil Control Lab, Inc	International Erosion Control Association, 2006
Total Suspended Solids Removal	78%	78%	78%	78%	78%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006

Table 2.2. Filtrexx® Inlet Protectio Performance and Design Specifications Summary. *(continued)*

Design Diameter / Design & Performance	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Turbidity Reduction	63%	63%	63%	63%	63%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Clay (<0.002mm) Removal	65%	65%	65%	65%	65%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Silt (0.002-0.05mm) Removal	64%	64%	64%	64%	64%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
TSS Removal w/PAM	97%	97%	97%	97%	97%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
TSS Removal w/ Flocculent	97%	97%	97%	97%	97%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Turbidity Reduction w/PAM	98%	98%	98%	98%	98%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Turbidity Reduction w/ Flocculent	94%	94%	94%	94%	94%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006

(continued on next page)

Table 2.2. Filtrexx® Inlet Protection Performance and Design Specifications Summary. *(continued)*

Design Diameter / Design & Performance	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Total Phosphorus Removal	34%	34%	34%	34%	34%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Reactive Phosphorus Removal	38%	38%	38%	38%	38%	USDA ARS Environmental Quality Lab	American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Total Phosphorus Removal w/ Nutrient Agent	60%	60%	60%	60%	60%	USDA ARS Environmental Quality Lab	American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Reactive Phosphorus Removal w/ Nutrient Agent	99%	99%	99%	99%	99%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Nitrate-N Removal	25%	25%	25%	25%	25%	USDA ARS Environmental Quality Lab	American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Ammonium-N Removal	15%	15%	15%	15%	15%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Ammonium-N Removal w/ Nutrient Agent	33%	33%	33%	33%	33%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Motor Oil Removal w/ Hydrocarbon Agent	99%	99%	99%	99%	99%	USDA ARS Environmental Quality Lab	International Erosion Control Association, 2006
Diesel Fuel Removal w/ Hydrocarbon Agent	99%	99%	99%	99%	99%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Gasoline Removal w/ Hydrocarbon Agent	54%	54%	54%	54%	54%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link

Table 2.2. Filtrexx® Inlet Protection Performance and Design Specifications Summary. *(continued)*

Design Diameter / Design & Performance	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Cadmium (Cd) Removal w/ Heavy Metal Agent	73%	73%	73%	73%	73%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Chromium (Cr) Removal w/ Heavy Metal Agent	47%	47%	47%	47%	47%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Copper (Cu) Removal w/ Heavy Metal Agent	70%	70%	70%	70%	70%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Nickel (Ni) Removal w/ Heavy Metal Agent	69%	69%	69%	69%	69%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Lead (Pb) Removal w/ Heavy Metal Agent	73%	73%	73%	73%	73%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Zinc (Zn) Removal w/ Heavy Metal Agent	53%	53%	53%	53%	53%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Iron (Fe) Removal	22%	22%	22%	22%	22%	Soil Control Lab, Inc	
Manganese (Mn) Removal	8%	8%	8%	8%	8%	Soil Control Lab, Inc	
Total coliform Removal	67%	67%	67%	67%	67%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
E. coli Removal	67%	67%	67%	67%	67%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Enterococcus Removal	47%	47%	47%	47%	47%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
E. coli Removal w/ Bacteria Agent	98%	98%	98%	98%	98%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Fecal coliform Removal w/ Bacteria Agent	98%	98%	98%	98%	98%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Enterococcus Removal w/ Bacteria Agent	91%	91%	91%	91%	91%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Other Recommended Uses	Inlet Protection, Check Dams, Slope Interruption	Inlet protection, Check Dams, Concrete Washout, Filtration System, Slope Interruption	Check Dams, Concrete Washout, Filtration System	Check Dams, Concrete Washout, Filtration System	Check Dams, Concrete Washout, Filtration System		

* Based on rainfall intensity of 12.5 cm (5 in)/hr applied to a bare clay loam soil at a 10% slope; runoff flow rate of 108 ml/sec/linear m (0.52 gpm/linear ft); and mean runoff volume of 230 L/m2 (6.3 g/ft2).

** Functional Longevity is dependent on mesh material type, UV exposure, freeze/thaw frequency, region of US/Canada, runoff-sediment frequency/ duration/loading, and adherence to specified maintenance requirement. Functional longevity ranges are estimates only. Site specific environmental conditions may result in significantly shorter or longer time periods.

*** Sediment Storage Capacity = sediment accumulation behind (directly upslope) + within the device.

Figure 2.1. Engineering Design Drawing for Curb and Drain Inlet Protection

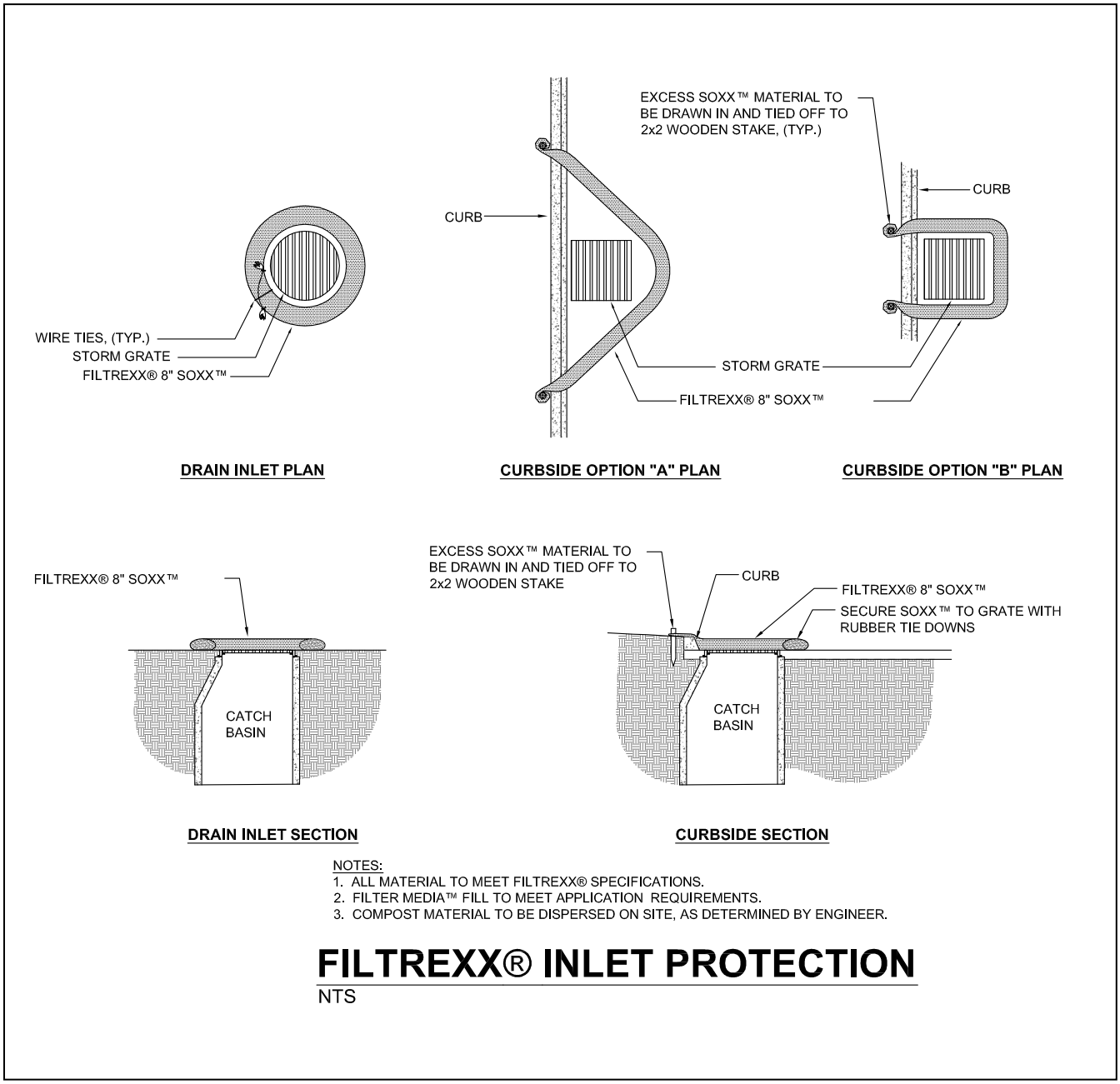
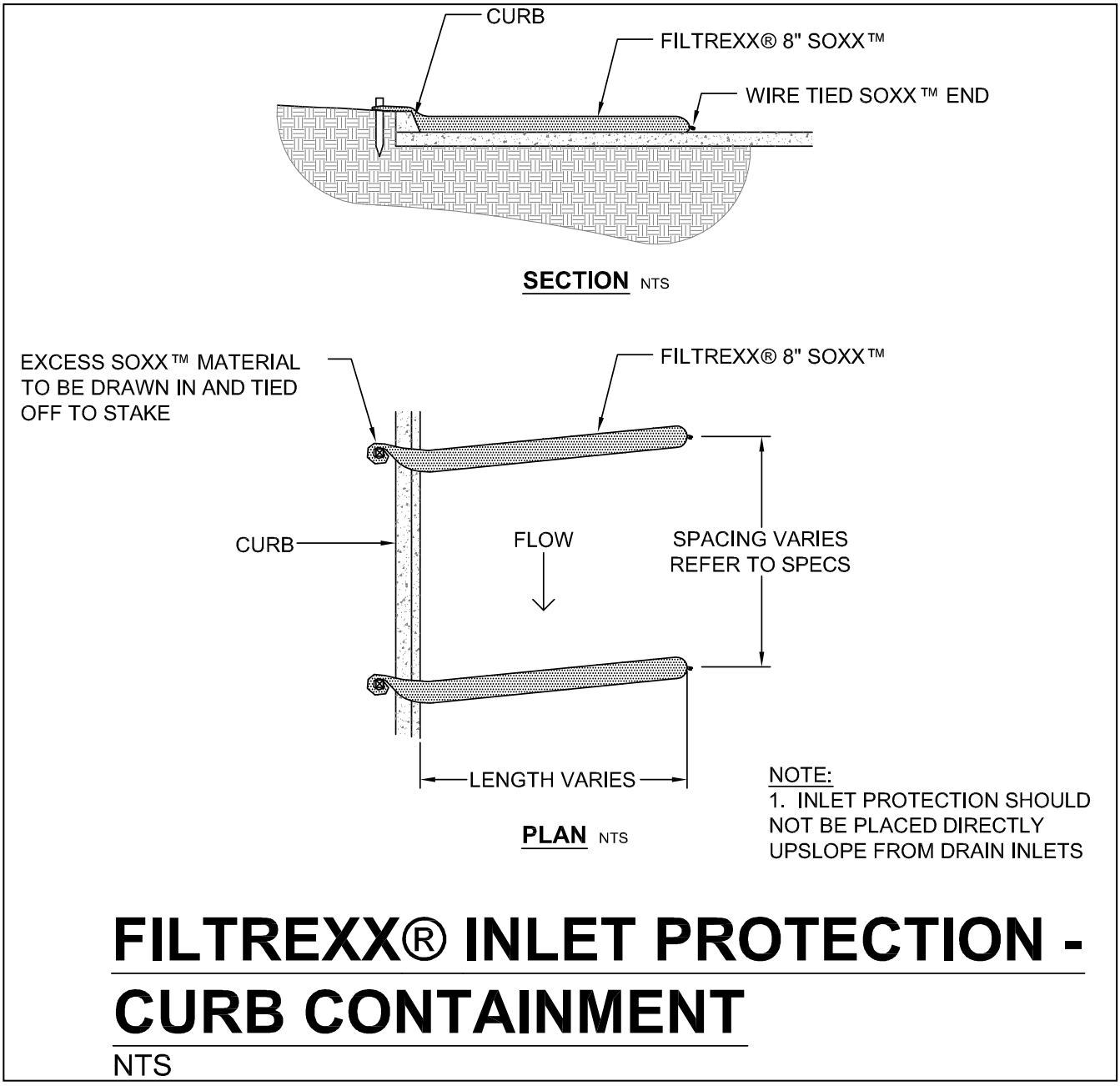


Figure 2.2. Engineering Design Drawing for Curb Sediment Containment Inlet Protection



DANDY BAG®
INLET PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT:

DANDY BAG®

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 **Description:**

1.1 Work covered under this item consists of installing a Dandy Bag® inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 **Material:**

2.1 The Dandy Bag® inlet protection unit shall be a **sewn in the U.S.A**. geotextile fabric unit fitted to the individual grate(s) and completely enclosing the grate(s).

2.2 The Dandy Bag® shall have lifting devises to allow manual inspection of the storm water system.

2.3 The Dandy Bag® unit shall utilize an orange monofilament fabric manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 X 300
Elongation	ASTM D 4632	%	40% X 25%
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec[1]	3.5
Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	gal/min/ft^2	250
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange[1]

[1]The color orange is a trademark of Dandy Products, Inc.
The property values listed above are effective October 2010 and are subject to change without notice.

3.**0 Installation:**

3.1 Place the empty Dandy Bag® over the grate as the grate stands on end.

3.2 For oil and sediment model; to install or replace absorbent, place absorbent pillow in pouch, on the bottom (below-grade side) of the unit.

3.3 Tuck the enclosure flap inside to completely enclose the grate.

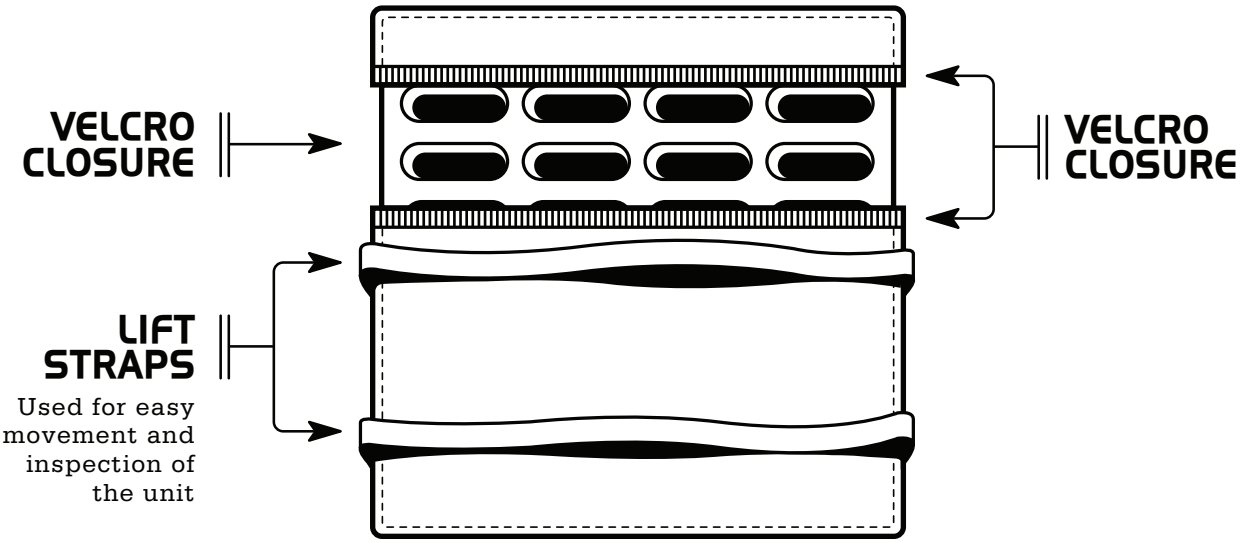
3.4 Holding the lifting devises, insert the grate into the inlet being careful not to damage the Dandy Bag® unit.

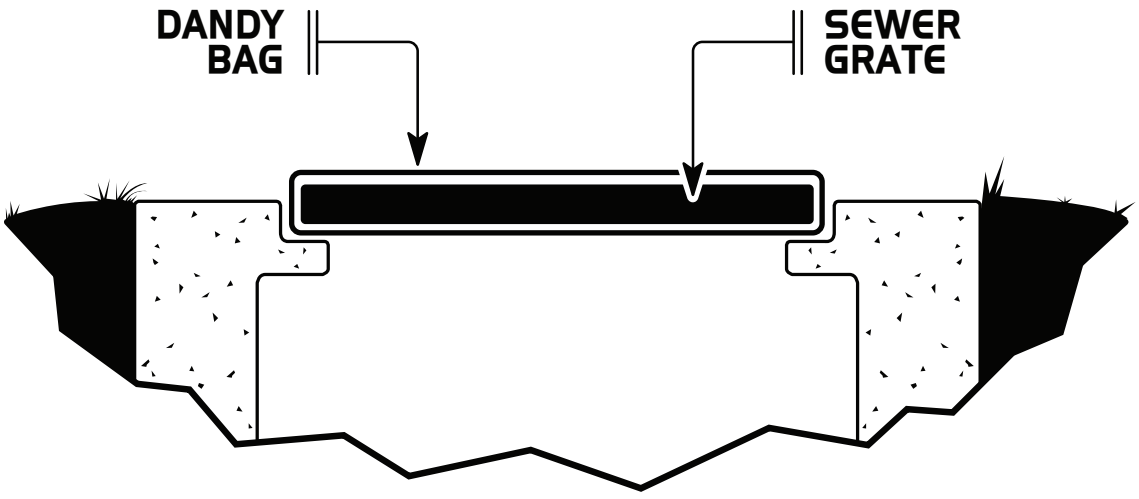
4.0 **Maintenance:**

4.1 The contractor shall remove all accumulated sediment and debris from surface and vicinity of unit after each rain event or as directed by engineer/inspector. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.

4.2 *For oil and sediment model; remove and replace absorbent when near saturation.*

DANDY BAG®


VELCRO CLOSURE
VELCRO CLOSURE
LIFT STRAPS
Used for easy movement and inspection of the unit


DANDY BAG
SEWER GRATE

DANDY CURB BAG®
CURB AND GUTTER INLET/GRATE PROTECTION SYSTEM
GUIDE SPECIFICATION

PRODUCT:

DANDY CURB BAG®

MANUFACTURER:

Dandy Products, Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E-mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 **Description:**

1.1 Work covered under this item consists of installing a Dandy Curb Bag® curb and gutter inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 **Material:**

2.1 The Dandy Curb Bag® curb and gutter inlet protection unit shall be a **sewn in the U.S.A.** geotextile fabric unit enclosing a porous structure in the form of a cylindrical tube placed in front of and extending beyond the inlet opening on both sides and have a geotextile fabric envelope fitted to the individual grate(s)on the street side of the sewn unit for grate(s) to be inserted and to completely enclose the grate(s).

2.2 The Dandy Curb Bag® shall have lifting devices to allow manual inspection of the storm water system.

2.3 The Dandy Curb Bag® unit shall utilize an orange monofilament fabric that is manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x 300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec^{1}	3.5

Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	gal/min/ft^2	250
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange[1]

[1]The color orange is a trademark of Dandy Products, Inc.
The property values listed above are effective October 2010 and are subject to change without notice.

3.0 **Installation:**

3.1 Place the empty Dandy Curb Bag® unit over the grate as the grate stands on end.

3.2 *For oil and sediment model; to install or replace absorbent, place absorbent pillow in pouch, on the bottom (below-grade side) of the unit.*

3.3 Tuck the enclosure flap inside to completely enclose the grate.

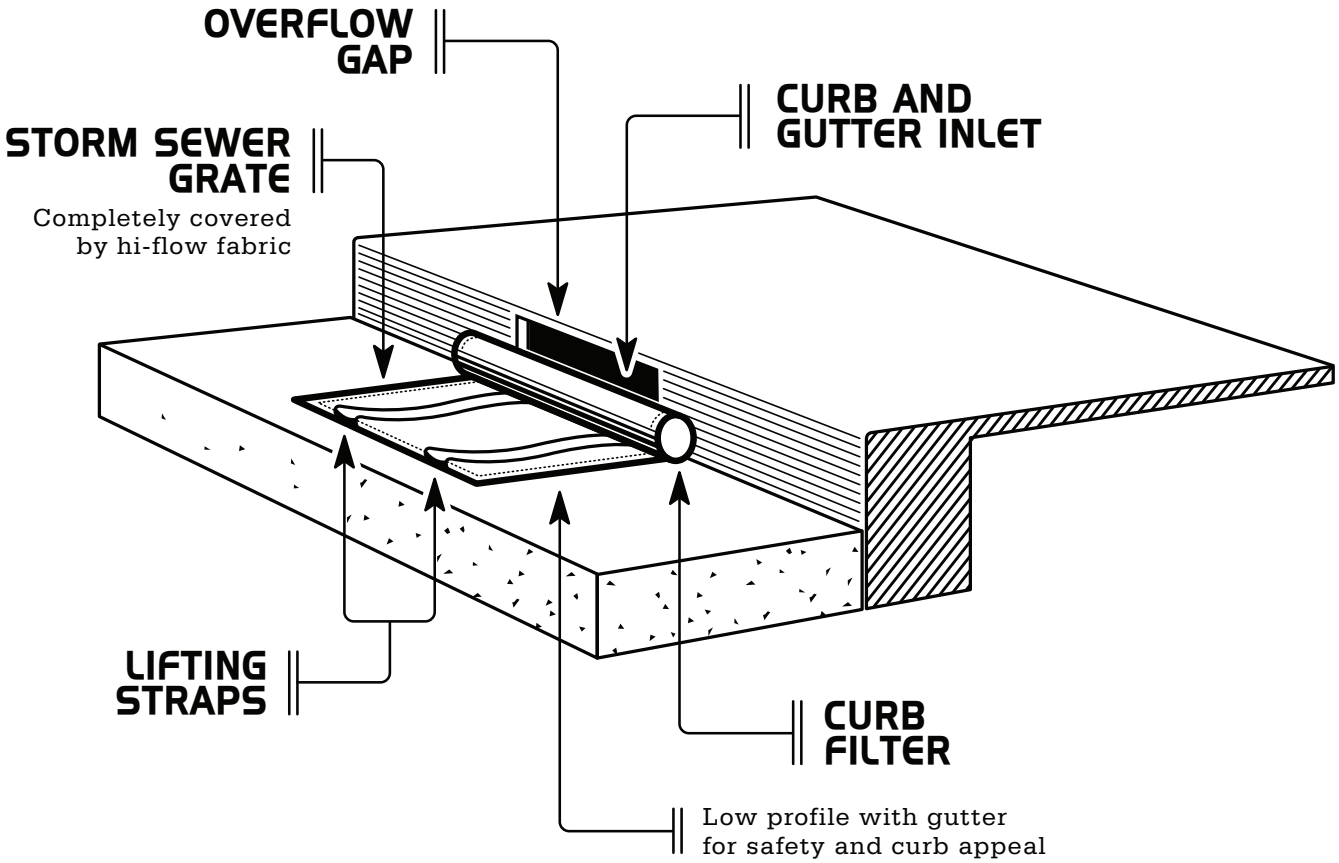
3.4 Holding the lifting devices, being careful not to damage the sewn fabric unit, insert the grate into its frame, street side edge first, then lower back edge with cylindrical tube into place. The cylindrical tube should be partially blocking the curb hood opening when installed properly.

4.0 **Maintenance:**

4.1 The contractor shall remove all accumulated sediment and debris from surface and vicinity of unit after each rain event or as directed by engineer/inspector. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.

4.2 *For oil and sediment model; remove and replace absorbent when near saturation.*

DANDY CURB BAG™



DANDY SACK®
INLET PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT:

DANDY SACK®

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 **Description:**

1.1 Work covered under this item consists of installing a Dandy Sack® inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 **Material:**

2.1 The Dandy Sack® inlet protection unit shall be a **sewn in the U.S.A.** geotextile fabric unit.

2.2 The Dandy Sack® shall have lifting straps to allow removal of the unit and manual inspection of the storm water system.

2.3 The Dandy Sack® unit shall utilize an orange monofilament fabric that is manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x 300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec[1]	3.5
Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	gal/min/ft^2	250
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange[1]

[1]The color orange is a trademark of Dandy Products, Inc.
The property values listed above are effective October 2010 and are subject to change without notice.

3.0 **Installation:**

3.1 Remove the grate from the catch basin.

3.2 For Oil and Sediment Model; to install or replace absorbent, place absorbent pillow in unit, on the bottom (below-grade side) of the unit.

3.3 Stand the grate on end. Move the top lifting straps out of the way and place the grate into the Dandy Sack® unit so that the grate is below the top straps and above the lower straps. The grate should be cradled between the upper and lower straps.

3.4 Holding the lifting devices, insert the grate into the inlet, being careful that the grate remains in place and being careful not to damage the Dandy Sack® unit.

4.0 **Maintenance:**

4.1 Remove all accumulated sediment and debris from vicinity of unit after each storm event.

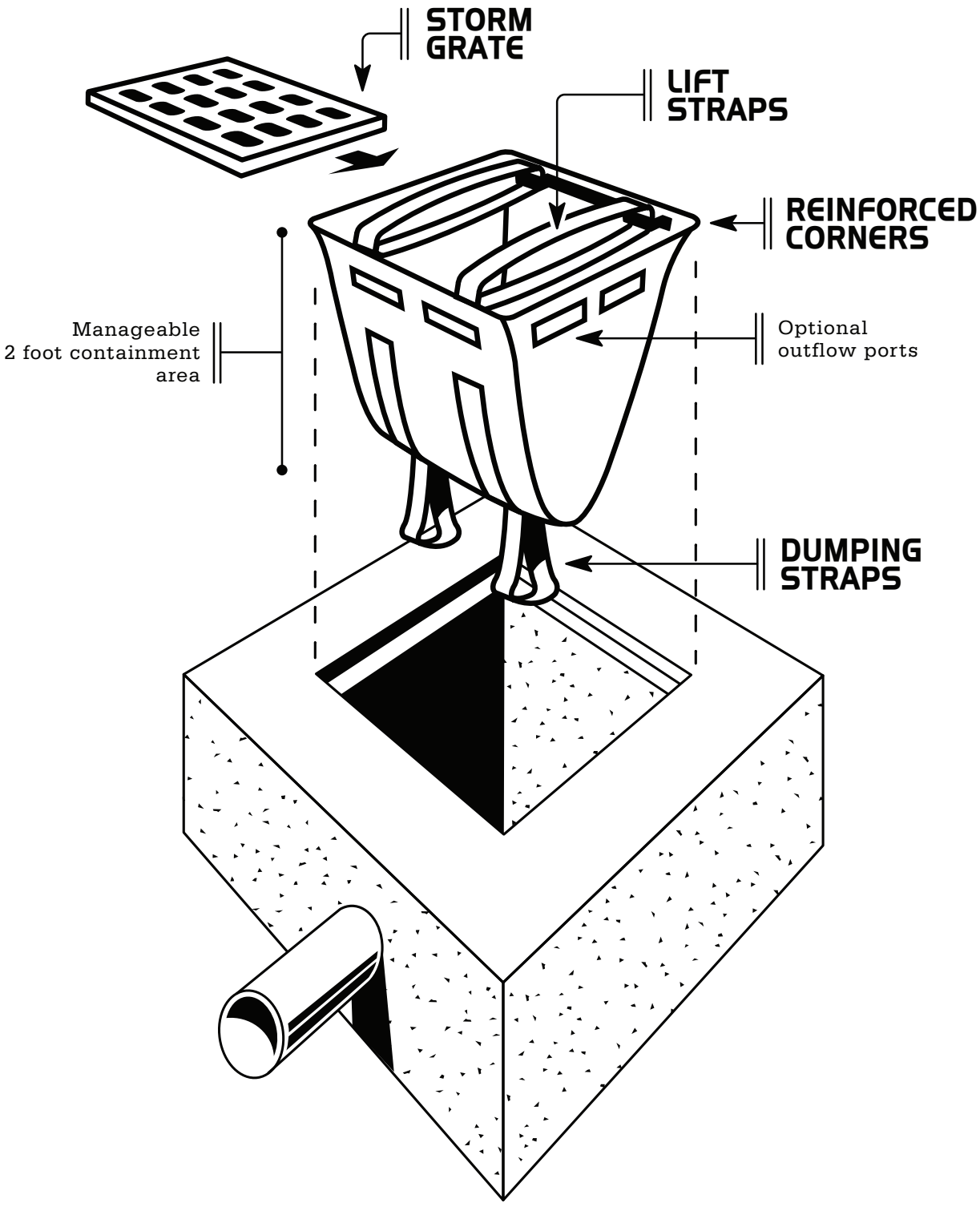
4.2 After each storm event and at regular intervals, look into the Dandy Sack® unit. If the unit is more than 1/3 full of accumulated sediment, the unit must be emptied.

4.3 To empty the unit, using the lifting straps lift the unit out of the inlet and remove the grate. Transport the unit to an appropriate location for removal of the contents. Holding the dumping straps on the outside at the bottom of the unit, turn the unit upside down, emptying the contents. Reinstall unit as above.

4.4 *For Oil and Sediment Model; remove and replace absorbent when near saturation.*

4.5 Dispose of unit and/or absorbent in accord with applicable Federal, state and local environmental laws and regulations.

DANDY SACK™


STORM GRATE
LIFT STRAPS
REINFORCED CORNERS
Manageable 2 foot containment area
Optional outflow ports
DUMPING STRAPS

DANDY CURB SACK®
CURB AND GUTTER INLET PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT:

DANDY CURB SACK®

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 **Description:**

1.1 Work covered under this item consists of installing a Dandy Curb Sack® curb and gutter inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 **Material:**

2.1 The Dandy Curb Sack® curb and gutter inlet protection unit shall be a sewn geotextile fabric unit **made in the U.S.A.** enclosing a porous structure in the form of a cylindrical tub placed in front and extending beyond the inlet opening on both sides and have a geotextile fabric sack attached designed to fit the opening of the catch basin or drop inlet and to hang underneath the grate and into the catch basin.

2.2 The Dandy Curb Sack® shall have lifting straps to allow removal of the unit and manual inspection of the storm water system.

2.3 The Dandy Curb Sack® unit shall utilize an orange monofilament fabric that is manufactured in the U.S.A with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x 300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec^{1}	3.5
Permeability	ASTM 4491	cm/sec	0.25

Water Flow Rate	ASTM 4491	gal/min/ft^2	250
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange[1]

[1]The color orange is a trademark of Dandy Products, Inc.
The property values listed above are effective October 2010 and are subject to change without notice.

3.0 **Installation:**

3.1 Remove the grate from the catch basin.

3.2 For Oil and Sediment Model; to install or replace absorbent, place absorbent pillow in unit, on the bottom (below-grade side) of the unit.

3.3 Stand the grate on end. Move the top lifting straps out of the way and place the grate into the Dandy Curb Sack® unit so that the grate is below the top straps and above the lower straps. The grate should be cradled between the upper and lower straps.

3.4 Holding the lifting devices, insert the grate into the inlet, then lower back edge with cylindrical tube into place, being careful that the grate remains in place and being careful not to damage the Dandy Curb Sack® unit. The cylindrical tube should partially block the curb hood opening when installed properly.

4.0 **Maintenance:**

4.1 Remove all accumulated sediment and debris from vicinity of unit after each storm event.

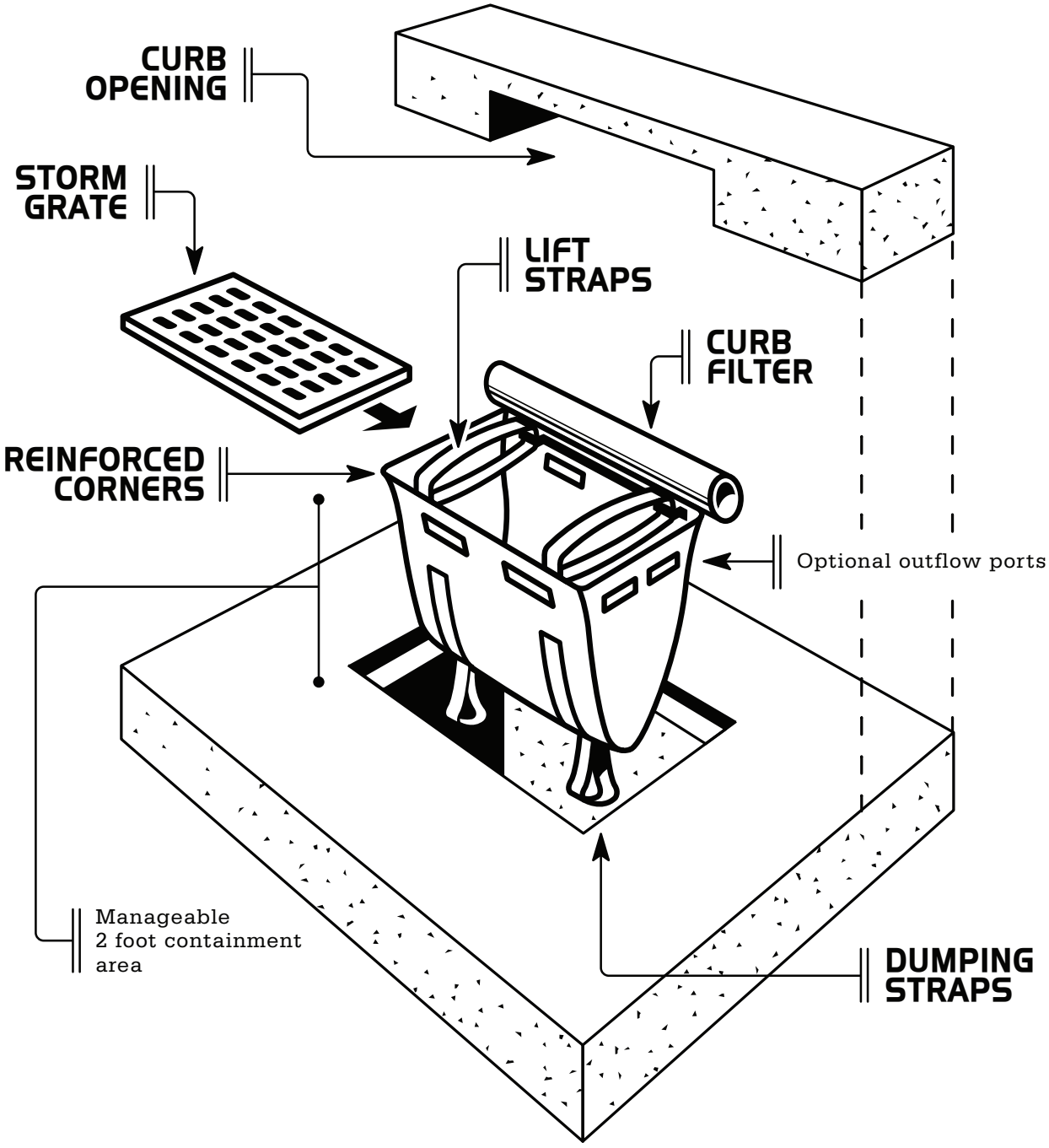
4.2 After each storm event and at regular intervals, look into the Dandy Curb Sack® unit. If the unit is more than 1/3 full of accumulated sediment, the unit must be emptied.

4.3 To empty the unit, using the lifting straps lift the unit out of the inlet and remove the grate. Transport the unit to an appropriate location for removal of the contents. Holding the dumping straps on the outside at the bottom of the unit, turn the unit upside down, emptying the contents. Reinstall unit as above.

4.4 *For Oil and Sediment Model; remove and replace absorbent when near saturation.*

4.5 Dispose of unit and/or absorbent in accord with applicable Federal, state and local environmental laws and regulations.

DANDY CURB SACK™



DANDY CURB®
GRATELESS CURB INLET AND MEDIAN BARRIER INLET PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT:

DANDY CURB®

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 **Description:**

1.1 Work covered under this item consists of installing a Dandy Curb® inlet protection system for inlets and median barrier inlets without grates. The purpose is to keep silt, sediment and construction debris out of the storm system.

2.0 **Material:**

2.1 The Dandy Curb® inlet protection system shall be a **sewn in the U.S.A**. fabric unit enclosing a porous structure in the form of a cylindrical tube placed in front of and extending beyond the inlet opening on both sides.

2.2 The Dandy Curb® inlet protection system shall have a pouch on the street side of the sewn unit for aggregate or other material to hold the unit in place.

2.3 The Dandy Curb® unit shall utilize an orange monofilament fabric that is manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x 300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec^{1}	3.5
Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	$gal/min/ft^{2}$	250
Ultraviolet Resistance	ASTM D 4355	%	70

Color			Orange[1]

[1]The color orange is a trademark of Dandy Products, Inc.
The property values listed above are effective October 2010 and are subject to change without notice.

3.0 Installation:

3.1 Place Dandy Curb® inlet protection unit on ground with aggregate pouch on street side near inlet it will be installed on.

3.2 For oil and sediment model, to install or replace absorbent, place absorbent sock in pouch.

3.3 Fill pouch with aggregate such as #5-7, 8's or similar to a level (at least ½ full) that will keep unit in place during a rain event and create a seal between the Dandy Curb® and the surface of the street. Reseal Velcro access.

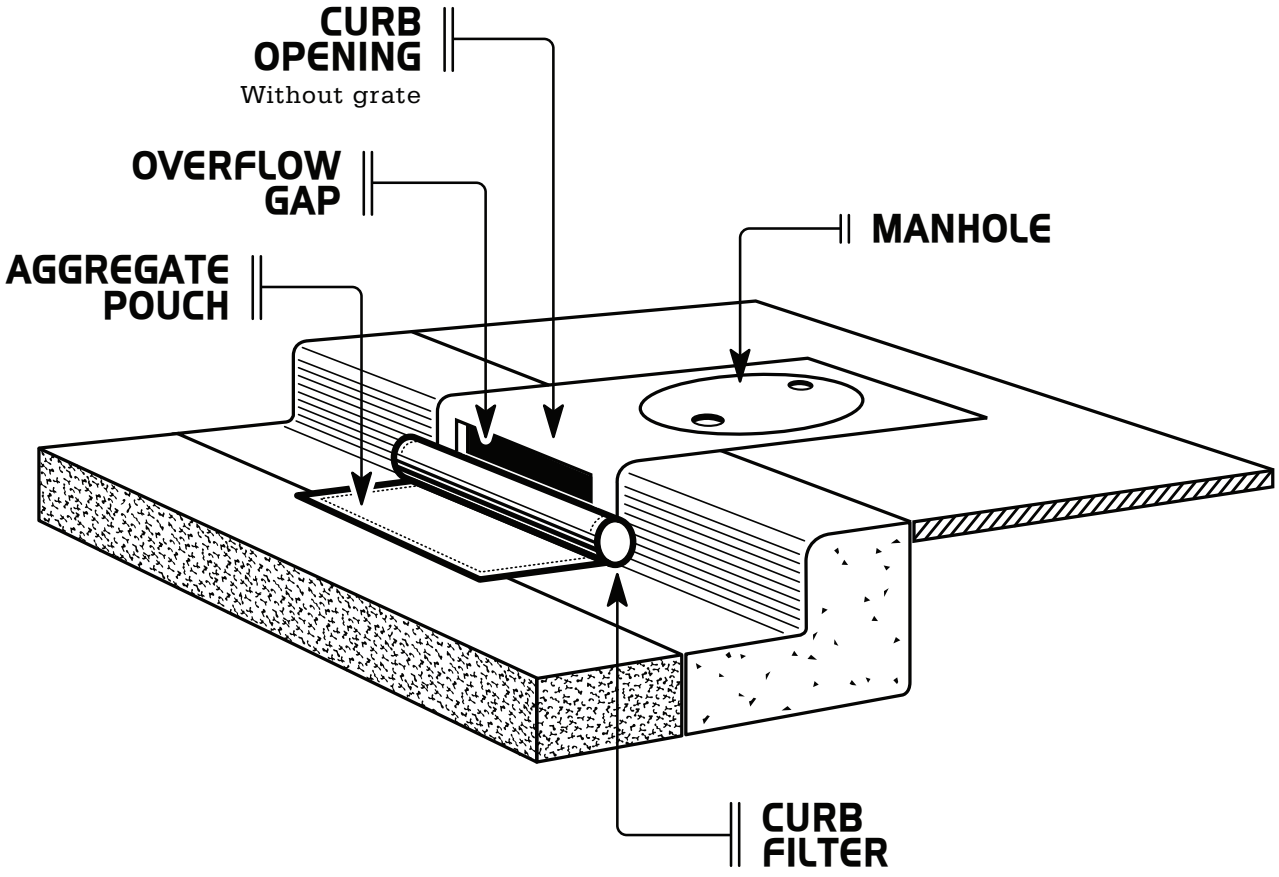
3.4 Center the unit against curb or median inlet opening so that the curb side of the unit creates a seal with the curb or median barrier and inlet structure. There will be approximately twelve (12) inches of the inlet protection unit overhanging on each side of the opening. If the unit is not installed in this manner, it will not function properly.

4.0 Maintenance:

4.1 The contractor shall remove all accumulated sediment and debris from surface and vicinity of unit after each rain event or as directed by engineer/inspector. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.

4.2 *For oil and sediment model; remove and replace absorbent when near saturation.*

DANDY CURB™


CURB OPENING
Without grate
OVERFLOW GAP
AGGREGATE POUCH
MANHOLE
CURB FILTER

DANDY POP® (POP-UP DANDY BAG®)
INLET PROTECTION SYSTEM GUIDE SPECIFICATION

PRODUCT: DANDY POP®

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 Section 1 - Description:

1.1 Work covered under this item consists of installing a Dandy Pop® inlet protection system. The purpose is to keep silt, sediment and construction debris out of the storm water system.

2.0 Section 2 - Material:

2.1 The Dandy Pop® inlet protection unit shall be a **sewn in the U.S.A**. geotextile fabric dome unit with a fully-covered support frame. The unit shall enclose the grate.

2.2 The Dandy Pop® shall unfold for installation to a height of approximately 24" (twenty-four inches).

2.3 The Dandy Pop® shall have lifting devises sewn to the bottom of the unit to assist in installation and to allow manual inspection of the storm water system.

2.4 The Dandy Pop® shall utilize an orange monofilament fabric that is manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile Strength	ASTM D 4632	lbs	450 x300
Grab Tensile Elongation	ASTM D 4632	%	40 x 25
Puncture Strength	ASTM D 4833	lbs	130
Mullen Burst Strength	ASTM D 3786	psi	600
Trapezoid Tear Strength	ASTM D 4533	lbs	165 x 150
% Open Area (POA)	COE - 22125-86	%	28
Apparent Opening Size	ASTM D 4751	US Std Sieve	30
Permittivity	ASTM D 4491	sec^{1}	3.5
Permeability	ASTM 4491	cm/sec	0.25
Water Flow Rate	ASTM 4491	$gal/min/ft^{2}$	250

Ultraviolet Resistance	ASTM D 4355	%	70
Color			Orange[1]

[1]The color orange is a trademark of Dandy Products, Inc.
The property values listed above are effective October 2010 and are subject to change without notice.

3.0 **Installation:**

3.1 Pop open the Dandy Pop® near the inlet.

3.2 Stand the grate on end and slide the Dandy Pop® over the grate.

3.3 For oil and sediment model; to install or replace absorbent, place absorbent pillow in pouch, on the bottom (below-grade side) of the unit. As desired, or required, attach absorbent pillow to provided tether loop.

3.4 Turn the grate 180° on end (turn twice) so that the opening is facing up.

3.5 Pull up slack and seal velcro® to enclose the grate.

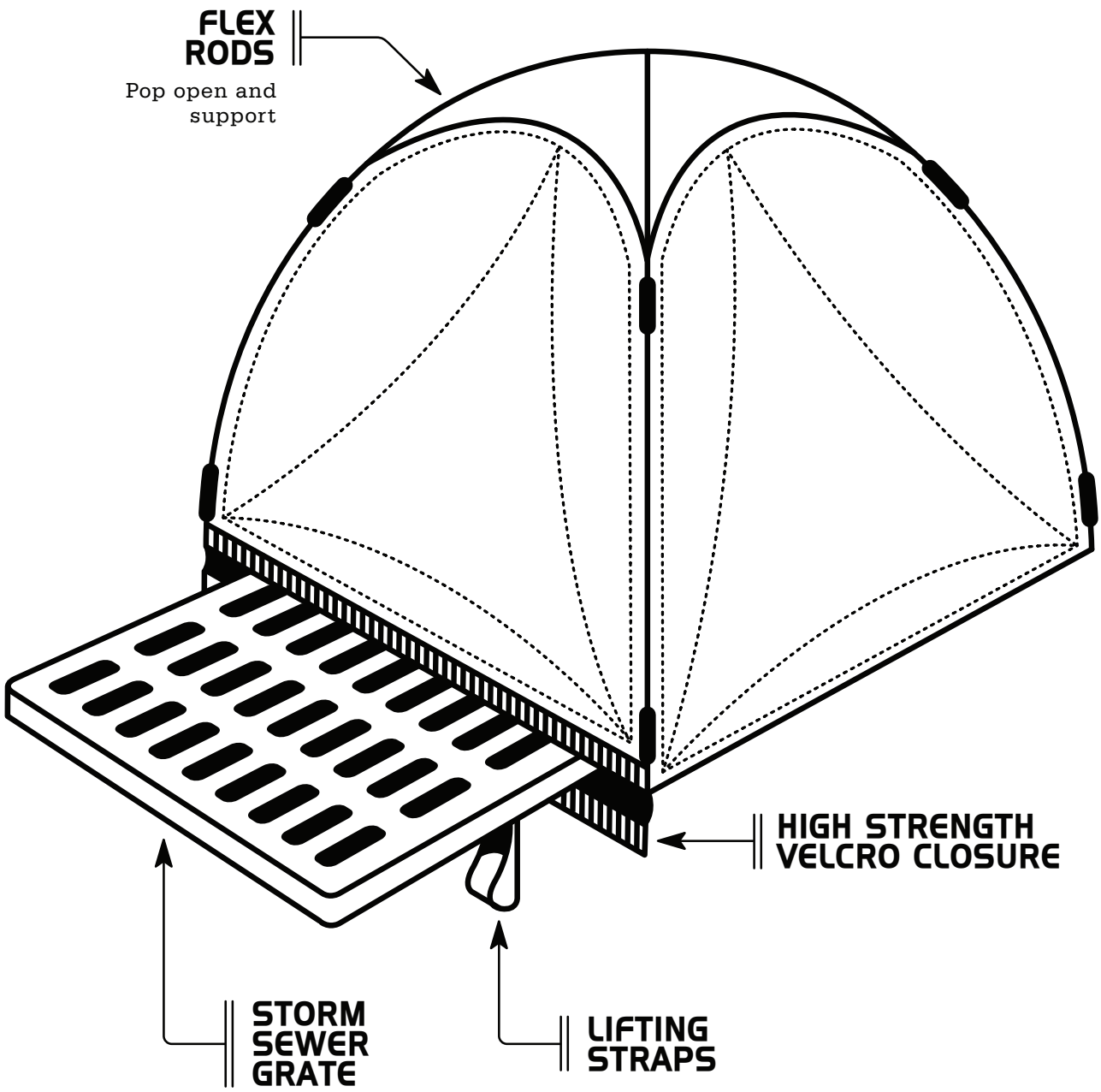
3.6 Lay the grate flat, and holding the lifting devises, insert the grate into the inlet making sure that the grate seats completely in the frame.

4.0 **Maintenance:**

4.1 The contractor shall remove all accumulated sediment and debris from panels and surface and vicinity of unit after each rain event or as directed by engineer/inspector. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.

4.2 For oil and sediment model; remove and replace absorbent when near saturation.

DANDY POP™


FLEX RODS
Pop open and support
HIGH STRENGTH VELCRO CLOSURE
STORM SEWER GRATE
LIFTING STRAPS

ACF Silt Sack®
Inlet Protection System Guide Specification

Product:
ACF Silt Sack®

Manufacturer:
ACF Environmental
2831 Cardwell Road
Richmond, VA 23234
Phone: 800-448-3636
E-mail: info@acfenv.com
Web: www.acfenvironmental.com

1.0 Description of Work

1.1 This work shall consist of furnishing, installing, maintaining, and removing Silt Sack® sediment control device as directed by the engineer or as shown on the site drawings.

2.0 Silt Sack® Materials

2.1 Types of Silt Sack®:

Type A: Standard Silt Sack® (overflows optional)
Type B: Standard Silt Sack® with curb deflector (overflows optional)
Type C: Standard Silt Sack® with adjustable frame (overflows optional)

2.2 Silt Sack® shall be manufactured from a specially designed woven polypropylene geotextile and sewn by a double needle machine, using a high strength nylon thread.

Silt Sack® seams have been tested by a third party laboratory under ASTM D-4884 (Standard Test Method for Strength of Sewn or Bonded Seams of Geotextiles). The results are listed in Table 1 & 2 below.

Table 1: Silt Sack® Regular Flow Seam Strength Results (ASTM D-4884)

Parameter	MARV	Units
Maximum Load	852	LBS
Maximum Strength	1280	LB/FT

2.3 Silt Sack® shall be manufactured to fit the opening of the catch basin or drop inlet. Silt Sack® will have the following features: two dump straps attached at the bottom to facilitate the emptying of Silt Sack®; Silt Sack® shall have lifting straps as an integral part of the system to be used to lift Silt Sack from the basin; Silt Sack® shall have a restraint cord approximately halfway up the depth of the sack to keep the sides from expanding toward the catch basin wall (this cord is also a visual means of indicating when the sack should be emptied). Once the cord is covered with sediment, Silt Sack should be emptied, cleaned, and placed back into the basin for reuse.

2.4 The Silt Sack® unit shall utilize a woven fabric with the following characteristics:

Silt Sack® Regular Flow

Property	Test Method	Units	MARV
Grab Tensile	ASTM D-4632	LBS	281 x 170
Grab Elongation	ASTM D-4632	%	16 x 7
CBR Puncture	ASTM D-6241	LBS	1005
Trapezoid Tear Strength	ASTM D-4533	LBS	85 x 61
UV Resistance @ 500 Hours	ASTM D-4355	%	96
AOS	ASTM D-4751	U.S. SIEVE	40
Flow Rate	ASTM D-4491	GPM/FT	38.5
Permittivity	ASTM D-4491	SEC^{-1}	0.51

Note: Property values listed above are effective September 2017 and are subject to change.

Note: Property values listed above are effective September 2017 and are subject to change.
All properties are Minimum Average Roll Values (MARV)

3.0 Section 3: Construction Sequence & Maintenance

3.1 To install Silt Sack® in the catch basin, remove the grate and place the sack in the opening. Hold approximately six inches of the sack outside the frame. This is the area of the lifting straps. Replace the grate to hold the sack in place.

3.2 When the restraint cord is no longer visible, Silt Sack® is full and should be emptied.

3.3 To remove Silt Sack®, take two pieces of 1" diameter rebar and place through the lifting loops on each side of the sack to facilitate the lifting of the Silt Sack®.

3.4 To empty Silt Sack®, place unit where the contents will be collected. Place the rebar through the lift straps (connected to the bottom of the sack) and lift. This will lift Silt Sack® from the bottom and empty the contents. Clean out and rinse. Return Silt Sack® to its original shape and place back in the basin.

3.5 Silt Sack® is reusable. Once the construction cycle is complete, remove Silt Sack® from the basin and clean. Silt Sack® should be stored out of sunlight until next use.

SILTSACK®
SEDIMENT CAPTURE DEVICE

INLET PROTECTION

PROTECTS CATCH BASINS FROM CONSTRUCTION RUNOFF

Siltsack® is a temporary catch basin filter that removes sediment, trash and debris from entering a catch basin. Siltsack can be manufactured with built-in curb deflectors and overflow holes.

Routine inspection of Siltsack's collected sediment level is important to prevent ponding around catch basins.

FEATURES:

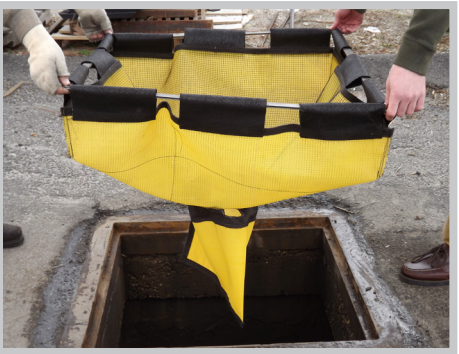
- Two dump straps attached at the bottom to facilitate emptying
- Lifting loops to remove sack from basin
- Restraint cord to keep sides away from basin walls
- Multiple types of Siltsack available
  - **Type A**: Original Siltsack
  - **Type B**: Siltsack with curb deflector
  - **Type C**: Siltsack with adjustable frame

ADVANTAGES:

- Made to fit any size inlet
- Easy to install and economical
- US patented
- Custom sizes available
- Undergrate design so it is not easily disturbed
- Type C has adjustable frame

TYPE A

TYPE C



TYPE C

1.19

For more information about Inlet Protection, contact Inside Sales at 800.448.3636
email at info@acfenv.com

ACF ENVIRONMENTAL

SPECIFICATIONS

Siltsack is manufactured from woven polypropylene geotextile and fits the opening of a catch basin or drop inlet.

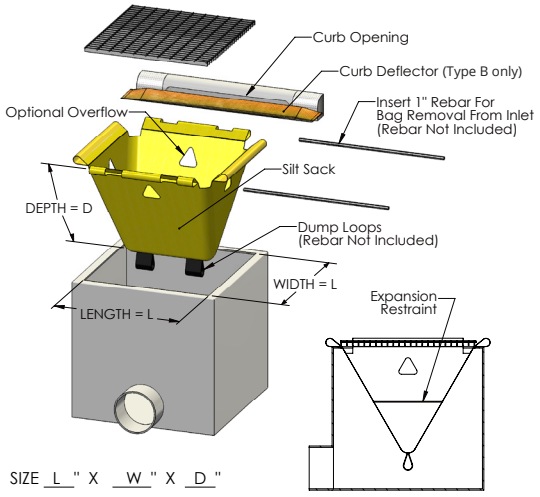
Specs for Siltsack Regular Flow

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile	ASTM D4632	lbs	281 x 170
Grab Elongation	ASTM D4632	%	16 x 7
Puncture	ASTM D6241	lbs	1005
Trapezoid Tear	ASTM D4533	lbs	85 x 61
AOS	ASTM D4751	US Sieve	40
Flow Rate	ASTM D4491	gal/min/ft ^{2}	38.5
Permittivity	ASTM D4491	sec $^{-1}$	0.51

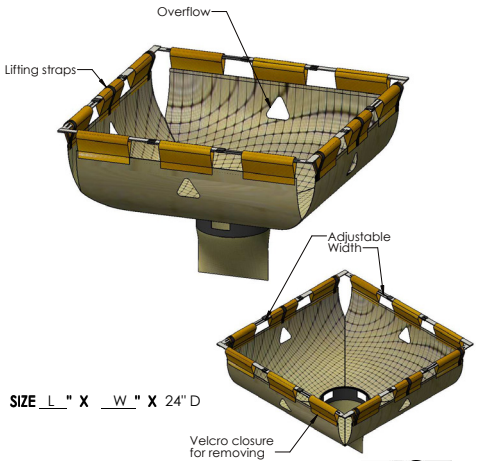
Specs for Siltsack High Flow

PROPERTY	TEST METHOD	UNITS	TEST RESULTS
Grab Tensile	ASTM D4632	lbs	274 x 237
Grab Elongation	ASTM D4632	%	27 x 12
Puncture	ASTM D6241	lbs	754
Trapezoid Tear	ASTM D4533	lbs	63 x 56
AOS	ASTM D4751	US Sieve	20
Flow Rate	ASTM D4491	gal/min/ft ^{2}	250
Permittivity	ASTM D4491	sec $^{-1}$	3.45

TYPE A AND B



TYPE C



ACF ENVIRONMENTAL
LET'S GET IT DONE®
800.448.3636
acfenvironmental.com

GRATE BAG

Section 1: Definition

A temporary filter for a storm drain inlet or curb inlet.

Purpose

To prevent sediment from entering storm drainage systems prior to permanent stabilization of the disturbed area.

Conditions Where Practice Applies

Where existing or proposed grated storm drain inlets are to be made operational before project completion and permanent stabilization of the corresponding disturbed drainage area.

Planning Considerations

All storm drain inlets that are made operational during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.

The following inlet protection devices are for drainage areas of one acre or less. Runoff from larger disturbed areas should be routed to a temporary sediment trap (VESCH Std. & Spec. 3.13) or a temporary sediment basin (VESCH Std. & Spec. 3.14).

Section 2: Material

1. See Grate Bag product specification sheet.

Construction Specifications

1. Remove the grate from the catch basin.
2. Holding the lifting devices, insert the grate into the inlet, being careful that the grate remains in place and being careful not to damage the unit.

Section 3: Design Criteria

1. The drainage area shall be no greater than 1 acre.

Section 4: Maintenance

1. Remove all accumulated sediment and debris from vicinity of unit after each storm event.
2. After each storm event and at regular intervals, look into the bag unit. If the unit is more than 1/3 full of accumulated sediment, the unit must be emptied.

Section 2: Material
The Grate Bag

The Grate Bag traps sand, debris, and most silt particles before they enter the sump or pipes. Costly basin and pipe system cleaning is reduced. Best of all, **The Grate Bag** can be reused.

Note: Color of material may vary

Property	Test Method	Units	MARV
Grab Tensile	ASTM D4632	lbs	255x275
Grab Elongation	ASTM D4632	%	20x15
Trapezoidal Tear	ASTM D4533	lbs	40x50
Puncture	ASTM D4833	lbs	135
Mullen Burst	ASTM D3786	psi	420
Permittivity	ASTM D4491	sec-1	1.5
Water Flow	ASTM D4491	gpm/sq ft	200
AOS	ASTM D4751	U.S. Std	20
UV Resistance	ASTM D4355	%/hrs	90/500

The Grate Bag is a Best Management Practice, which is normally used in conjunction with other BMP's to reduce the impact of sedimentation. Use of **The Grate Bag** as the sole BMP should be limited to those applications where sediment loading within the storm-runoff is minimal. Bags are constructed with tension cable as well as overflow holes that are placed one foot from bottom of bag. **The Grate Bag** is an excellent "final filter" in a well-designed and implemented erosion control system

L & M Supply Co., Inc. P. O. Box 640 Willacoochee, GA 31650
Direct Phone: 912-534-6071 - Toll Free: 800-948-7870 - Fax: 912-534-6254
Website: www.landmsupplyco.com

The Grate Bag

The Grate Bag traps sand, debris and most silt particles before they enter the sump or pipes. Costly basin and pipe system cleaning is reduced. Best of all, The Grate Bag can be emptied and reused for the life of the construction project.

Routine inspection of a The Grate Bag's collected sediment level is important to prevent "ponding" around storm drains. The Grate Bag is a Best Management Practice, which is normally used in conjunction with other BMPs to reduce the impact of sedimentation. Use of The Grate Bag as the sole BMP should be limited to those applications where sediment loading within the storm runoff is minimal. The Grate Bag is an excellent "final filter" in a well-designed and implemented erosion control system.

Property	Test Method	Units	MARV
Grab Tensile	ASTM D4632	lbs	255x275
Grab Elongation	ASTM D4632	%	20x15
Trapezoidal Tear	ASTM D4533	lbs	40x50
Puncture	ASTM D4833	lbs	135
Mullen Burst	ASTM D3786	psi	420
Permittivity	ASTM D4491	sec-1	1.5
Water Flow	ASTM D4491	gpm/sq ft	200
AOS	ASTM D4751	U.S. Std	20
UV Resistance	ASTM D4355	% / hrs	90/500

- Curb Opening Deflector
- Lightweight
- Secondary sediment control
- Simple to install and economical
- Sizes available to fit all standard grate sizes
- Reusable
- Under grate design, so not disturbed easily

Standard Sizes:

24" x 24" x 36",
30" x 30" x 36"
32" x 32" x 36"
34" x 34" x 36"
36" x 36" x 36"

Manufactured by: L& M Supply Co., Inc.
P.O. Box 640 ▪ Willacoochee, GA 31650

Silt Management Supplies, LLC.
Partnering To Protect Our Environment

Silt Management Supplies, LLC.
Phone: 281-717-8921
www.siltmanagementsupplies.com

YELLOW JACKET DRAIN INLET FILTER

Section 1: Definition

A temporary filter for a storm drain inlet.

Purpose

To prevent sediment from entering storm drainage systems prior to permanent stabilization of the disturbed area.

Conditions Where Practice Applies

Where existing or proposed grated storm drain inlets are to be made operational before project completion and permanent stabilization of the corresponding disturbed drainage area.

Planning Considerations

All storm drain inlets that are made operational during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.

The following inlet protection devices are for drainage areas of one acre or less. Runoff from larger disturbed areas should be routed to a temporary sediment trap (VESCH Std. & Spec. 3.13) or a temporary sediment basin (VESCH Std. & Spec. 3.14).

Section 2: Material

1. See Yellow Jacket product specification sheet.

Construction Specifications

1. Remove the grate from the catch basin.
2. Holding the lifting devices, insert the grate into the inlet, being careful that the grate remains in place and being careful not to damage the unit.

Section 3: Design Criteria

1. The drainage area shall be no greater than 1 acre.

Section 4: Maintenance

1. Remove all accumulated sediment and debris from vicinity of unit after each storm event.
2. After each storm event and at regular intervals, look into the bag unit. If the unit is more than 1/3 full of accumulated sediment, the unit must be emptied.

YellowJacket Drain Inlet Filter

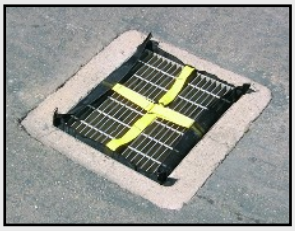
Finally, a drain inlet filter that is affordable and simple to install and maintain. The yellow webbing secures the filter to the grate and doubles as lifting straps to quickly and easily remove the filter, grate and all, for simple cleaning.

YellowJackets are designed to accommodate rectangular inlets as well as square and round drains.

Easily removable 2" Foam Backer Rod is now included with each YellowJacket Drain Inlet Filter.

Custom Sizing Available

Patent *US 7,156,987*



AVAILABLE NOW

Optional **Green Ocean** oil absorbent pillow now available.

4 Sizes To Choose From
2'x2' • 2'x3' • 2'x4' • 3'x4'

Quick Look

• Filter Bag	High strength woven geotextile
• Strapping	Weather resistant 2" polypropylene webbing
• Overflow	4 overflow portals built into each unit
• Dimensions	4 sizes available to fit most drains (custom sizing available)
• Maintenance	Remove with built-in lifting straps, clean filter and replace

Specifications

PROPERTY	TEST METHOD	DATA	
		METRIC	ENGLISH
Mechanical			
Grab Tensile Strength	ASTM D 4632	1.56 x 1.25kN	350 x 280 lbs
Grab Tensile Elongation		20 x 15%	
Trapezoidal Tear	ASTM D 4533	0.49 x 0.33 kN	110 x 75 lbs
CBR Puncture	ASTM D 6241	4.448 kN	1000 lbs
Endurance			
UV Resistance	ASTM D 4355	90% @ 500 hrs	
Hydraulics/Filtration			
Permittivity	ASTM D 4491	1.5 sec $^{-1}$	
Water Flow Rate		12,218 l/pm/m²	200 g/pm/ft²
Percent Open Area	CE-02215	20 – 30%	
Apparent Opening Size (AOS)	ASTM D 4751	0.85 mm	20 US Std. Sieve
Physical			
Thickness (Minimum)	ASTM D 5199	0.38 mm	15 mils

Dispose of unit in accordance with applicable Federal, state and local environmental laws and regulations. The user is solely responsible for the compliance with maintenance and disposal laws and regulations. The manufacturer or seller assumes no responsibility for proper or improper maintenance or disposal.

Proudly made in the USA by Pollution Solution, Inc.

psi

Phone 800-808-1774 Fax 866-990-1527
www.psiyes.com info@psiyes.com

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Pollution Solution Inc.

PROJECT: Geotextile Testing

Date Received: **11/25/2015**
Date Reported: **12/7/2015**
Client Sample ID: **YJ23** **(Applies to all YellowJacket sizes)**
Material Description: **Yellow Jacket Model 23**

QC'd By: Maria Espitia
TRI Job No.: **R15048**
TRI Control No.: **00842**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"	**5.55**	**5.60**	**5.57**	**5.50**	**5.54**						**5.55**	**0.04**	**5.50**	**5.60**	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 400 lbs															
	Grab Breaking Load (lbs)															
	Direction A	**321**	**300**									**311**	**15**	**300**	**321**	
	Direction B	**303**	**319**									**311**	**11**	**303**	**319**	
	Apparent Breaking Elongation (percent)															
	Direction A	**33**	**34**									**34**	**0**	**33**	**34**	
	Direction B	**32**	**33**									**32**	**0**	**32**	**33**	
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
	Direction A	**137**	**140**									**139**	**2**	**137**	**140**	
	Direction B	**130**	**137**									**133**	**5**	**130**	**137**	
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*	**6.45**	**6.89**	**6.60**	**6.98**							**6.73**	**0.24**	**6.45**	**6.98**	
	Permeability (cm./ sec.)	**0.43**	**0.47**	**0.45**	**0.47**							**0.45**	**0.02**	**0.43**	**0.47**	
	Flow Rate (gpm/ ft.^{2})	**483**	**515**	**493**	**522**							**503**	**18**	**483**	**522**	

Continued on next page

1160 North Gilbert Street, Anaheim, CA 92801, www.precisionlabs.net
Precision Geosynthetic Laboratories International dba TRI Environmental, Inc.

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Pollution Solution Inc.

PROJECT: Geotextile Testing

Date Received: **11/25/2015**
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Material Description: **Yellow Jacket Model 23**

QC'd By: Maria Espitia
TRI Job No.: **R15048**
TRI Control No.: **00842**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		30-45										**30-45**	**N/A**	**N/A**	**N/A**	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.578										**0.578**	**N/A**	**N/A**	**N/A**	
ASTM D6241	Static Puncture Strength (lbs)															
	The specimens were tested in accordance with ASTM D6241. Specimens were conditioned for 1 hr in the laboratory at 21+/-5° C (75+/-3.6oF) and at 60%+/-10 Relative Humidity. Specimens were secured between the holding plates ensuring that they extended to or beyond the outer edges of the clamping plates.															
		763	**782**									**772**	**14**	**763**	**782**	
	Deflection @ Maximum Force (in)															
		1.3	**1.5**									**1.4**	**0.1**	**1.3**	**1.5**	

(End of Table 2)

DEWATERING STRUCTURE (VESCH MINIMUM STANDARDS AND SPECIFICATIONS 3.26)

DANDY DEWATERING BAG ™
PUMPED WATER SEDIMENT CONTROL SYSTEM GUIDE SPECIFICATIONS

PRODUCT:

DANDY DEWATERING BAG™

MANUFACTURER:

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
E Mail dlc@dandyproducts.com
Web www.dandyproducts.com

1.0 **Description:**

1.1 Work covered under this consists of furnishing, installing, maintaining, and removal of the Dandy Dewatering Bag ™ The purpose is to control sediment discharge in any dewatering or pumped water application.

2.0 **Material:**

2.1 The Dandy Dewatering Bag™ shall be a bag sewn of nonwoven fabric **in the U.S.A.** using a double needle machine and a high strength thread.

2.2 The Dandy Dewatering Bag™ shall have a spout opening large enough to accommodate at least a four (4) inch pump discharge hose with an attached strap to tie unit closed.

2.3 The Dandy Dewatering Bag™ Seams shall be a double stitched "J" type seam with an average wide width strength per ASTM D-4884 of 60lb/in for a 8 oz. fabric manufactured in the U.S.A. with the following characteristics:

PROPERTY	TEST METHOD	UNITS	MARV
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.9 (205)
Grab Tensile Elongation	ASTM D 4632	%	50
Puncture Strength	ASTM D 4833	kN (lbs)	0.58 (130)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	2618 (380)
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.36 (80)
% Open Area	COE - 22125-86	%	N/A
Apparent Opening Size	ASTM D 4751	mm (US Std Sieve)	.0180 (80)

Permittivity	ASTM D 4491	sec^{1}	1.2
Permeability	ASTM 4491	cm/sec	0.21
Water Flow Rate	ASTM 4491	$l/min/m^2$ ($gal/min/ft^2$)	3866 (95)
Ultraviolet Resistance	ASTM D 4355	%	70
Color			Black

3.0 **Installation:**

3.1 Lifting straps (not included) should be placed under the unit to facilitate removal after use.

3.2 Unfold Dandy Dewatering Bag™ on a stabilized area over dense vegetation, straw, or gravel (if an increased drainage surface is needed) or as detailed in plans.

3.3 Insert discharge hose from pump into Dandy Dewatering Bag™ a minimum of six (6) inches and tightly secure with attached strap to prevent water from flowing out of the unit without being filtered.

4.0 **Maintenance:**

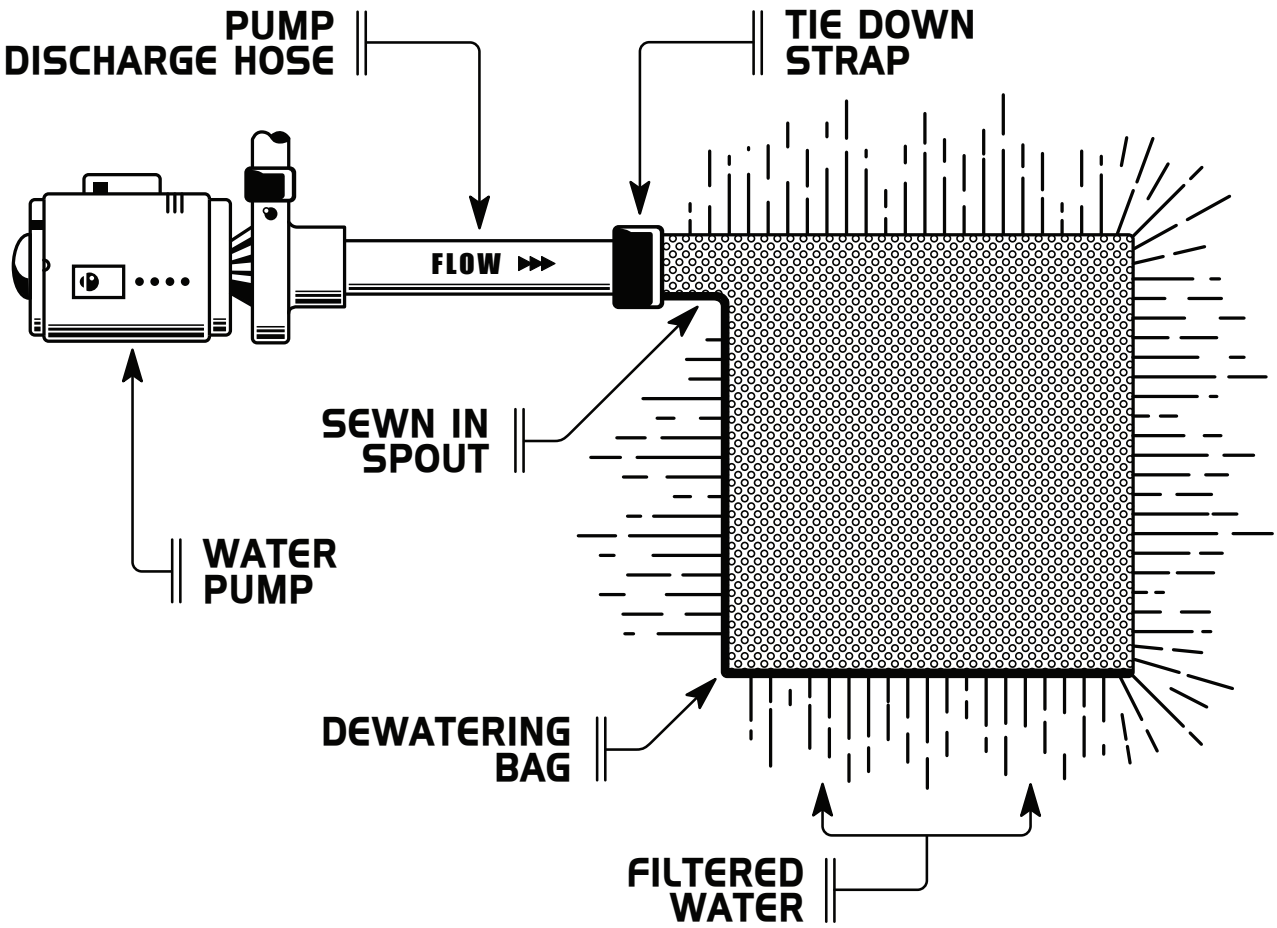
4.1 Replace the unit when ½ full of sediment or when sediment has reduced the flow rate of the pump discharge to an impractical rate.

4.2 Remove and dispose of the sediment in a manner satisfactory to the engineer/inspector or in one of the following ways:

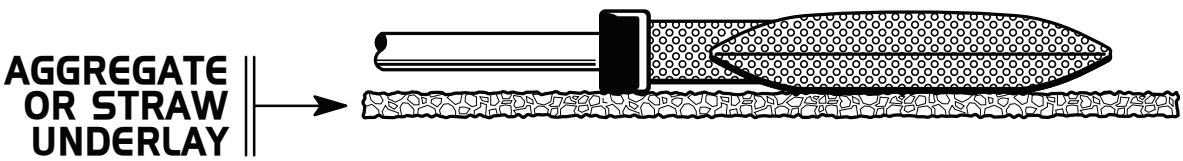
A) Remove the unit and sediment from environmentally sensitive areas and waterways. At the approved disposal site, slit the unit; remove the sediment and grade smoothly into the existing topography. Dispose of unit no longer in use at an appropriate recycling or solid waste facility.

DANDY DEWATERING BAG™

TOP VIEW



SIDE VIEW



{For added flow}

ACF DIRTBAG DEWATERING BAG
PUMPED WATER SEDIMENT CONTROL SYSTEM GUIDE SPECIFICATIONS

PRODUCT:

ACF DIRTBAG® DEWATERING BAG

MANUFACTURER:

ACF Environmental
2831 Cardwell Rd.
Richmond, VA 23234234
Phone: 800-448-3636
Fax: 804-743-7779777
Web www.acfenvironmental.coml.com

1.0 **Description:**

1.1 Work covered under this consists of furnishing, installing, maintaining, and removal of the ACF Dirtbag® Dewatering Bag. The purpose is to control sediment discharge in any dewatering or pumped water application.

2.0 **Material:**

2.1 ACF Dirtbag® units are manufactured using non-woven or woven polypropylene fabric. See product specification sheet for additional detail.

3.0 **Installation:**

3.1 Dirtbag® Dewatering Bag must be monitored at all times during use (over-filling may cause rupture)

3.2 Unfold Dirtbag® Dewatering Bag place on aggregate, straw bales, or other well vegetated surfaces increase flow rate

3.3 Insert discharge hose from pump into Dirtbag® Dewatering Bag a minimum of six (6) inches and tightly secure to prevent water from flowing out of the unit without being filtered.

4.0 **Maintenance:**

4.1 Replace the unit when ½ full of sediment or when sediment has reduced the flow rate of the pump discharge to an impractical rate.

4.2 Remove and dispose of the sediment in a manner satisfactory to the engineer/ inspector.

DIRTBAG®
DEWATERING BAG

SEDIMENT AND PERIMETER CONTROL

FILTERS SILT, SAND, AND FINES OUT OF PUMPED WATER

Dirtbag dewatering bags remove silt, sand, and other debris from pumped water on construction sites, ponds, dredging locations and more.

The bag easily connects to a pump discharge hose using the 4" neck and sewn in attachment straps. To increase the effectiveness of Dirtbag's filtration system, ACF Environmental recommends placing the product on a bed of hay bales or aggregate to maximize water flow through the surface area of the bag. Doing so also helps protect the surrounding area from erosion, sediment displacement and the pollution of receiving waters. Under most circumstances, a 15x15 Dirtbag can pass up to 500 gallons of water per minute.

USE GUIDELINES:

- **Dirtbag must be monitored at all times during use (over-filling may cause rupture)**
- Flow and removal rates vary based on particle size/ sediment composition
- To increase flow rate place Dirtbag on aggregate, straw bales, or other porous surfaces
- Dirtbag is full when it can no longer efficiently pass water at a reasonable rate

ADVANTAGES:

- High flow rate
- 15' x 15' Dirtbag is rated up to 500 GPM pump
- Built-in neck receives up to 4" discharge hose
- Removes sediment, trash, and debris
- Economical alternative to other methods
- Custom sizes available upon request

9.19

Full product specifications are available on the Dirtbag product page at www.acfenvironmental.com

For more information about Sediment and Perimeter Control, contact Inside Sales at 800.448.3636
email at info@acfenv.com

SPECIFICATIONS

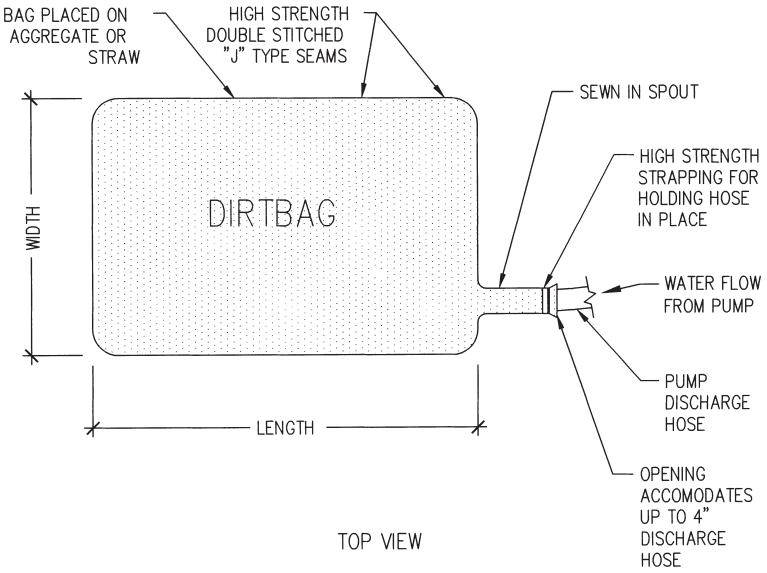
Dirtbag sizes include: 4' x 6' | 5' x 5' | 8' x 10' | 10' x 10' | 15' x 15' | and custom sizes on request

PROPERTY	TEST METHOD	MARV
Weight	ASTM D3776	8 oz/yd
Grab Strength (Tensile)	ASTM D4632	205 lbs
CBR Puncture	ASTM D6241	525 lbs
UV Resistance	ASTM D4355	70%
Apparent Opening Size (AOS)	ASTM D4751	80 US std. sieve
Flow Rate	ASTM D4491	90 gal/min/ft^2
Permittivity	ASTM D4491	1.4 sec^{-1}

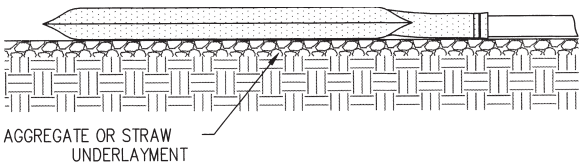
Dirtbag® seam test results (ASTM D4884)

NONWOVEN DIRTBAG	WOVEN DIRTBAG
Maximum load 786 lbs	Maximum load 934 lbs
Maximum strength 1178 lb/ft	Maximum strength 1402 lb/ft

NOTE: Each test result was derived from a material failure rather than a stitch failure.



TOP VIEW



SIDE VIEW

Testing Details:

Dirtbag has been tested under ASTM D-7880 and ASTM-7701. These are standard test methods for determining flow rate of water and suspended solids retention from a closed geosynthetic bag. Testing summary available upon request.

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DISCLAIMER: Use of dewatering bags is a standard construction method throughout the U.S. ACF Environmental in not liable for any damage caused by rupture or over-filling of Dirtbag. If Dirtbag fails to fully pass pumped water, turn off pump and contact ACF Environmental at 800-448-3636.

DIRTBAG®

TECH NOTE

BACKGROUND INFORMATION:

ACF Dirtbag® units are manufactured using non-woven or woven polypropylene fabric. The purpose of the ACF Dirtbag® is to collect sand, silt, and fines, from dewatering effluent stormwater that enters streams, surrounding property, and storm sewers. Over the last 25 years during which ACF has produced and sold Dirtbags, ACF has compiled a vast amount of test data from third party laboratories and field installations. The purpose of this technical document is to note and explain the various test methods and results related to the Dirtbag® product.

DEWATERING BAG TEST METHODS:

ASTM D-4751: Standard Test Method for Determining Apparent Opening Size of a Geotextile

ASTM D-4884: Standard Test Method for Strength of Sewn or Bonded Seams of Geotextiles

ASTM D-7880: Standard Test Method for Determining Flow Rate of Water and Suspended Solids Retention from a Closed Geosynthetic Bag

APPARENT OPENING SIZE:

The non-woven polypropylene fabric used to manufacture the Dirtbag® product has an AOS measured by U.S. Sieve of 80. This fabric has been tested by a third party lab under ASTM D-4751. A U.S. Sieve of 80 will filter out a 177 micron size particle. This is especially important in dewatering bags, because the efficiency of the Dirtbag® product increases when a sediment coating builds up on the inside walls of the bag after pumping has begun. The discharged water becomes visibly clear due to the smaller particles being retained by the sediment coating. Each project has a different set of variables such as particle size, discharge rate, duration of pumping, and other jobsite specifics that will change the performance of the bag accordingly.

SEAM STRENGTH:

The ACF Dirtbag® is produced by sewing two layers of geotextile fabric together to form a bag, so the strength of the seam that connects the two layers is a very essential characteristic. ACF has third party test data on that seam strength, shown in the table below.

SUMMARY OF ASTM D-4884
(SEAM STRENGTH TESTING)

Parameter:	MARV
Type of Seam:	J-SEAM
Maximum Load (lbs)	938
Maximum Strength (ppi)	118

It is important to note that each test result was deemed as a material failure, rather than stitch failure or thread pull out, which shows that the seam and thread used by ACF is an acceptable means of connection for Dirtbag® units.

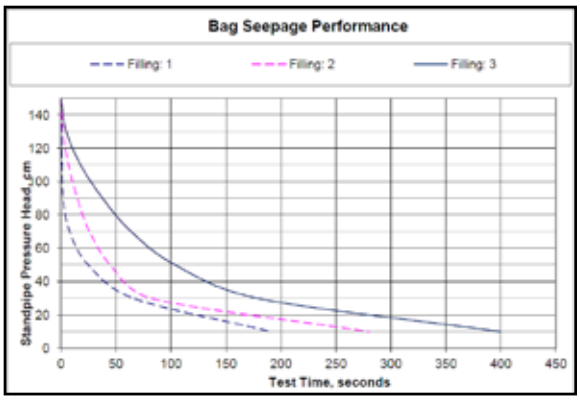
DIRTBAG® TECH NOTE

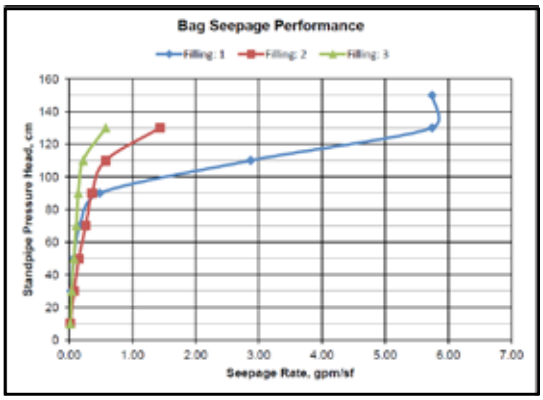
MANUFACTURED BAG TESTING (ASTM D-7880):

In addition to seam strength and AOS testing, our third party lab has also compiled results for the ACF Dirtbag® when tested as an actual manufactured bag. For this test, a geotextile bag was constructed to form a container that will expand when filled to accommodate a prescribed volume (in this case, 12 gallons) of water/soil slurry. The bag sits on a mesh platform and the slurry is introduced through an inlet standpipe causing the bag to expand into a pillow. Through multiple fillings, the relationship between head pressure and seepage time is established, along with associated flow rate and filtration efficiency. Tests conducted according to the above protocol produced the following results:

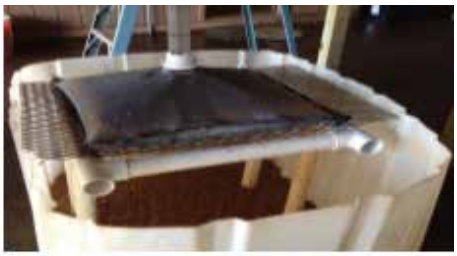
SUMMARY OF ASTM D-7880 RESULTS

Avg. Removal/Retention Efficiency (%)	Residual High-Head Flow Rate (gpm/sf)	Residual Low-Head Flow Rate (gpm/sj)
98.4	1.44	0.04





PICTURES FROM TEST SETUP



The results from this test prove the fact that the ACF Dirtbag® becomes more efficient once a sediment coating builds up on the inside walls of the Dirtbag®, while producing discharged water that is visibly clear due to the smaller particles being retained by the sediment coating.

CONCLUSION:

ACF feels that it is important to have the above mentioned test results done by a third party test laboratory in relation to the dewatering bag product. ACF strives to be a high quality manufacturer that goes above and beyond the required test results and information levied by regulatory agencies nationwide.

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