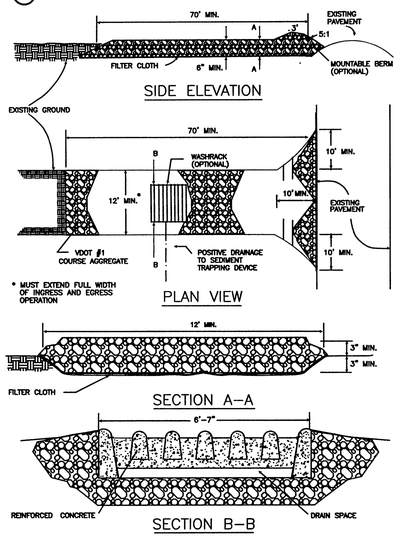
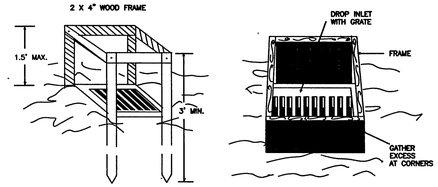
(CE) STONE CONSTRUCTION ENTRANCE



SOURCE: ADAPTED from 1983 Maryland Standards for Soil erosion and Sediment Control, and Va. DSWC — Plate 3.02-1

(SF) SILT FENCE DROP INLET PROTECTION

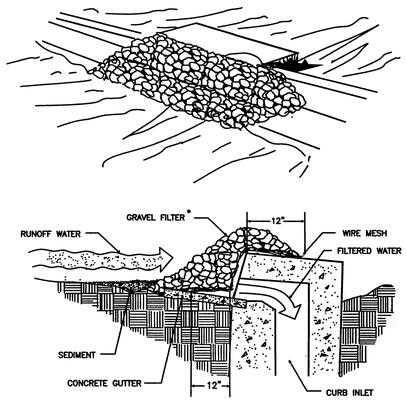


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPE NO GREATER THAN 5%) WHERE THE INLET SHEET OR OVERLAND FLOWS (NOT EXCEEDING 1 C.F.S.) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

SOURCE: N.C. Erosion and Sediment Control Planning and Design Manual, 1988 — PLATE 3.07-1

(IP) GRAVEL CURB INLET SEDIMENT FILTER



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

* GRAVEL SHALL BE VDOT #3, #357 OR 5 COARSE AGGREGATE.

SOURCE: VA. DSWC — PLATE 3.07-6

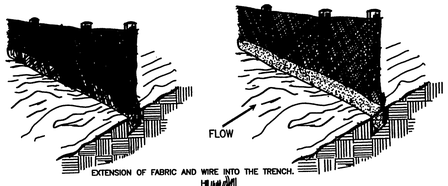
(SF) CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)

1. SET POSTS AND EXCAVATE A 4"X4" TRENCH UPSLOPE ALONG THE LINE OF POSTS.

2. STAPLE WIRE FENCING TO THE POSTS.

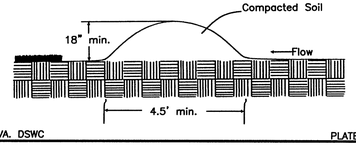
3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.

4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



SOURCE: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood & Byant — PLATE 3.05-1

(DD) TEMPORARY DIVERSION DIKE



SOURCE: VA. DSWC — PLATE 3.09-1

(TS) TEMPORARY SEEDING MIXTURE

ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS

PLANTING DATES	SPECIES	RATE LBS/ACRE
SEPT 1–FEB15	50/50 MIX OF ANNUAL RYEGRASS (LOLIUM MULTI–FLORUM) & CEREAL (WINTER) RYE (SECALE CEREALE)	50–100
FEB 16–APR 30	ANNUAL RYEGRASS (LOLIUM MULTI–FLORUM)	60–100
MAY 1–AUG 31	GERMAN MILLET (SETARIA ITALICA)	50

FERTILIZER: 10–20–10 14 LBS / 1000 SF.
INCORPORATE LIME AND FERTILIZER IN TO THE TOP 2–4 INCHES OF SOIL.

SURFACE ROUGHENING: IF THE AREA HAS BEEN RECENTLY LOOSENED OR DISTURBED, NO FURTHER ROUGHENING IS REQUIRED. WHEN THE AREA IS COMPACTED, CRUSTED, OR HARDENED, THE SOIL SURFACE SHALL BE LOOSENED BY DISKING, RAKING HARROWING, OR OTHER ACCEPTABLE MEANS.

(PS) PERMANENT SEEDING MIXTURE

TYPE A

15 OCTOBER TO 1 FEBRUARY
K–31 FESCUE ● 5 LB / 1000 SF
BORZY WINTER RYE ● 1/2 LB / 1000 SF

1 FEBRUARY TO 1 JUNE
K–31 FESCUE ● 5 LB / 1000 SF
ANNUAL RYE ● 1/2 LB / 1000 SF

1 JUNE TO 1 SEPTEMBER
K–31 FESCUE ● 5 LB / 1000 SF
GERMAN MILLET ● 1/2 LB / 1000 SF

1 SEPTEMBER TO 15 OCTOBER
K–31 FESCUE ● 5 LB / 1000 SF
ANNUAL RYE ● 1/2 LB / 1000 SF

TYPE B (SLOPES 3:1 OR STEEPER)

15 MARCH TO 1 MAY
CROWN VETCH ● 1/2 LB / 1000 SF
PERENNIAL RYEGRASS ● 1/2 LB / 1000 SF
RED TOP ● 1/8 LB / 1000 SF

15 AUGUST TO 1 OCTOBER
CROWN VETCH ● 1/2 LB / 1000 SF
PERENNIAL RYEGRASS ● 1/2 LB / 1000 SF
RED TOP ● 1/8 LB / 1000 SF

LIME: 140 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE

FERTILIZER: 5–20–10 ● 25 LB / 1000 SF
38–0–0 ● 7 LB / 1000 SF

MULCH: IF REQUIRED, SHALL BE USED OVER ALL SEEDED AREAS AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 1.75 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

SOIL CONDITIONING: INCORPORATION OF LIME AND FERTILIZER, SELECTION OF CERTIFIED SEED, MULCHING, MAINTENANCE OF NEW SEEDLINGS, AND RESEEDING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS CONTAINED WITHIN THE VIRGINIA SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. ADDITIONAL SEEDING TO BE PERFORMED AS REQUIRED BY THE INSPECTOR.

SEED APPLICATION: APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

NO.	TITLE	KEY	SYMBOL
3.02	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE	(CE)	
3.03	CONSTRUCTION ROAD STABILIZATION	(CRS)	
3.05	SILT FENCE	(SF)	
3.07	STORM DRAIN INLET PROTECTION	(IP)	
3.09	TEMPORARY DIVERSION DIKE	(DD)	
3.31	TEMPORARY SEEDING	(TS)	
3.32	PERMANENT SEEDING	(PS)	
3.35	MULCHING	(MU)	

4VAC50-30-40 Minimum Standards.
An erosion and sediment control program adopted by a district or locality must be consistent with the following criteria, techniques and methods:

1. Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade but will remain dormant for longer than 30 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year. **AS SHOWN ON PLANS.**

2. During construction of the project, soil stockpiles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as borrow areas and soil intentionally transported from the project site. **AS SHOWN ON PLANS.**

3. A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that, is uniform, mature enough to survive and will inhibit erosion. **AS SHOWN ON PLANS.**

4. Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place. **AS SHOWN PLANS.**

5. Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation. **AS SHOWN ON PLANS.**

6. Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin. **AS SHOWN ON PLANS.**
   a. The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.
   b. Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a twenty-five year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.

7. Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected. **MAXIMUM SLOPE FOR THIS PROJECT IS 3 TO 1.**

8. Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure. **AS SHOWN ON PLANS.**

9. Whenever water seeps from a slope face, adequate drainage or other protection shall be provided. **IF ENCOUNTERED DURING CONSTRUCTION THEN APPROPRIATE MEASURE WILL BE PROVIDED.**

10. All storm sewer inlets that are made operable 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. **AS SHOWN ON PLANS.**

11. Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel. **AS SHOWN ON PLANS.**

12. When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials. **NOT APPLICABLE.**

13. When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of nonerodible material shall be provided. **NOT APPLICABLE.**

14. All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met. **NOT APPLICABLE.**

15. The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed. **NOT APPLICABLE.**

16. Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria: **AS SHOWN ON PLANS.**
   a. No more than 500 linear feet of trench may be opened at one time.
   b. Excavated material shall be placed on the uphill side of trenches.
   c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.
   d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
   e. Restabilization shall be accomplished in accordance with these regulations.
   f. Applicable safety regulations shall be complied with.

17. Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities. **PREVENT DEBRIS FROM ENTERING BLUE HILLS VILLAGE DRIVE.**

18. All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the local program authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation. **CONTACT ROANOKE CITY PRIOR TO REMOVING MEASURES.**

19. Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria: **STORMWATER FROM THE DEVELOPMENT OF LOT 3 WAS TAKEN INTO ACCOUNT DURING THE DEVELOPMENT OF THE OVERALL SUBDIVISION. FINAL DESIGN SHOWS POND 1 OUTFALLING INTO AN EXISTING STORM DRAIN SYSTEM AND POND 2 INTO AN EXISTING DITCH ALONG ROUTE 460.**
   a. Concentrated stormwater runoff leaving a 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.
   b. Adequacy of all channels and pipes shall be verified in the following manner:
      (1) The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or
      (2) (a) Natural channels shall be analyzed by the use of a two-year storm to verify, that stormwater will not overtop channel banks nor cause erosion of channel bed or banks; and
      (b) All previously constructed man-made channels shall be analyzed by the use of a ten-year storm to verify that stormwater will not overtop its banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and
      (c) Pipes and storm sewer systems shall be analyzed by the use of a ten-year storm to verify that stormwater will be contained within the pipe or system.
   c. If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:
      (1) Improve the channel to a condition where a ten-year storm will not overtop the banks and a two-year storm will not cause erosion to the channel bed or banks; or
      (2) Improve the pipe or pipe system to a condition where the ten-year storm is contained within the appurtenances; or
      (3) Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls into a natural channel or will not cause the re-development peak runoff rate from a ten-year storm to increase when runoff outfalls into a man-made channel; or
      (4) Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the plan-approving authority to prevent downstream erosion.
   d. The applicant shall provide evidence of permission to make the improvements.
   e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development of the subject project.
   f. If the applicant chooses an option that includes stormwater detention he shall obtain approval from the locality of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.
   g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.
   h. All on-site channels must be verified to be adequate.
   i. 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.
   j. In applying these stormwater runoff criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations.
   k. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state.

APPROVED
JUL 28 2009

COMMONWEALTH OF VIRGINIA
ROBERT H. WRAMPLER, JR.
Lic. No. 34713
7/16/09
PROFESSIONAL ENGINEER

ENGINEERING CONCEPTS, INC.
20 S. ROANOKE ST., PO BOX 619
FINCASTLE, VIRGINIA 24090
540.473.1253 FAX: 540.473.1254

No.	Revision	By	Appd.	Date
1	ROANOKE CITY COMMENTS	JSC	RHW	7/15/09

Drawn DRB/JSC
Designed DRB/JDE
Checked JSC
Approved RHW

DEVELOPEMENT PLAN FOR LOT 3 – BLUE HILLS VILLAGE

EROSION CONTROL DETAILS ROANOKE, VIRGINIA

AS SHOWN
JUNE 24, 2009
PROJECT: 07047.01

6