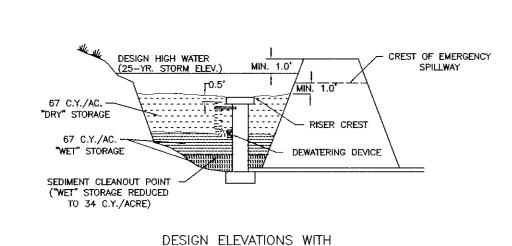
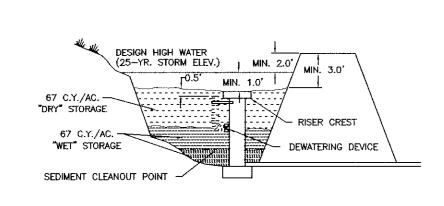
STORMWATER MANAGEMENT COST ESTIMATE ALL COSTS GIVEN ARE COMPLETE IN PLACE DESCRIPTION QUANTITY UNIT COST | TOTAL COST UNIT CLEARING & GRUBBING LS **EXCAVATION** CY **EMBANKMENT** CY FENCING STRUCTURES ACCESS ROAD AS-BUILTS SUB-TOTAL 10% CONTINGENCY TOTAL PROJECT COST SEDIMENT BASIN SCHEMATIC **ELEVATIONS**



EMERGENCY SPILLWAY



DESIGN ELEVATIONS WITHOUT **EMERGENCY SPILLWAY** (RISER PASSES 25-YR. EVENT)

GENERAL NOTES

- . DESIGN OF DETENTION BASINS SHALL CONFORM TO THE REQUIREMENTS OF THE COUNTY OF ROANOKE DRAINAGE STANDARDS (REF. SECTIONS 503.02, 503.03, AND 505.02). THE DESIGN OF THE FACILITY AND PREPARATION OF AS-BUILT PLANS SHALL BE BY A CERTIFIED PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE COMMONWEALTH
- . ACCESS TO THE FACILITY MUST BE PROVIDED IN ACCORDANCE WITH THE COUNTY OF ROANOKE DESIGN AND CONSTRUCTION STANDARDS FOR DETENTION PONDS, LATEST EDITION.
- 3. IF THE FACILITY IS OVER FOUR (4) FEET DEEP, TAKES OVER TWO (2) HOURS TO DRAIN. OR THE INTERIOR SLOPE EXCEEDS 3 (H): 1 (V), PERMANENT FENCING MAY BE REQUIRED, ADDITIONALLY, IF THE FACILITY IS IN A CONGESTED AREA OR WILL IN ANY WAY POSE A HAZARD TO THE GENERAL PUBLIC, FENCING MAY BE REQUIRED. FENCING SHALL BE A MINIMUM OF SIX (6) FEET HIGH, A MINIMUM OF STANDARD NINE GAUGE LINK FENCE, AND MUST HAVE ONE OR MORE LOCKING DOUBLE GATES (MINIMUM TEN FEET WIDE) FOR ACCESS.
- 4. DETENTION PONDS SHALL BE BONDED IN ACCORDANCE WITH THE ROANOKE COUNTY BONDING POLICY FOR SUBDIVISION AND SITE DEVELOPMENT. A SEPARATE BOND FOR THE DETENTION FACILITY WILL BE REQUIRED. AND ADMINISTERED APART FROM THE SUBDIVISION DEVELOPMENT BOND. REFERENCE ESTIMATE - THIS SHEET.
- 5. REFERENCE THE COUNTY OF ROANOKE DESIGN AND CONSTRUCTION STANDARDS FOR DETENTION PONDS, LATEST EDITION, FOR ACCEPTANCE AND MAINTENANCE OF THE FACILITY. CERTIFIED AS-BUILTS ARE REQUIRED AND MUST INCLUDE:
- A. DIMENSIONS OF THE FACILITY
- B. VOLUME @ MAXIMUM DEPTH
- C. ELEVATIONS OF STRUCTURES, SPILLWAYS, AND TOP
- D. MATERIALS VERIFICATION INCLUDING RESULTS OF DENSITY TESTS CONDUCTED BY AN INDEPENDENT SOIL TESTING LABORATORY
- E. LOCATION AND ELEVATION OF BENCHMARK.
- 6. ONE FOOT MINIMUM FREEBOARD REQUIRED FOR THE 100 YR WATER SURFACE ELEVATION.

CONSTRUCTION NOTES

- . SITE PREPARATION SHALL BE IN ACCORDANCE WITH THE COUNTY OF ROANOKE DESIGN AND CONSTRUCTION STANDARDS FOR DETENTION PONDS,
- 2. SLOPES STEEPER THAN 3 TO 1 (HORIZONTAL TO VERTICAL) SHALL BE BENCHED OR STEPPED PRIOR TO PLACING FILL ON THEM.
- 3. ON-SITE FILL MATERIAL OR BORROW FILL MATERIAL MAY BE UTILIZED. FILL MATERIAL SOILS, IN GENERAL:
- SHALL BE WITHIN AN ACCEPTABLE RANGE OF MOISTURE CONTENT C. SHALL NOT BE HIGHLY SUSCEPTIBLE TO VOLUME CHANGE (SHRINKAGE OR SWELL) OR SETTLEMENT
- 4. FILL MATERIALS CONTAINING ROCKS LARGER THAN SIX (6) INCHES (15.2 CM) SHALL NOT BE USED. THE UPPERMOST TWO (2) FEFT (6 ĆM) SHALL NOT HAVE ANY ROCK LARGER THAN TWO (2) ÌNCHES (5.1 CM) IN DIAMETER.
- 5. THE APPROVED FILL SHALL BE PLACED IN EIGHT (8) INCH (20 CM) LOOSE LIFTS. EACH LIFT SHALL BE SPREAD IN UNIFORM LAYERS. FILL SOIL SHALL BE UTILIZED ONLY WITHIN A MOISTURE RANGE OF +/- 5% OF THE OPTIMUM MOISTURE CONTENT. COMPACTION OF THE FILL SHALL BE PERFORMED WITH APPROVED EQUIPMENT. COMPACTION OF THE LAYERS SHALL BE CONTINUOUS AND UNIFORM.
- 6. EMBANKMENT MATERIAL IN FILL AREAS SHALL BE PLACED IN LIFTS NOT EXCEEDING EIGHT (8) INCHES AND SHALL BE COMPACTED TO A MINIMUM 95% DENSITY IN ACCORDANCE WITH SECTION 303 OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS.
- 7. FIELD DENSITY TESTS ARE TO BE CONDUCTED BY AN INDEPENDENT SOILS TESTING LABORATORY UNDER THE DIRECTION OF A QUALIFIED GEOTECHNICAL ENGINEER. THE RESULTS OF THESE TESTS SHALL BE SUBMITTED TO THE COUNTY OF ROANOKE WITH AS-BUILT PLANS AS A CONDITION OF ACCEPTANCE OF THE FACILITY BY THE COUNTY. FIELD DENSITY TESTS, AS DIRECTED BY THE ENGINEER SHALL BE PERFORMED PERIODICALLY TO DETERMINE THE DEGREE OF COMPACTION. ANY AREAS FAILING TO MEET THE ABOVE REQUIREMENTS SHALL BE REWORKED AND/OR RECOMPACTED UNTIL THE REQUIRED DEGREE OF COMPACTION IS
- 8. ANTI-SEEP COLLARS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
- 9. ALL DISTURBED AREAS SHALL BE COVERED WITH FOUR (4) INCHES OF TOPSOIL AND SEEDED.
- 10.THE MINIMUM SLOPE OF THE BASIN "FLOOR SHALL BE ONE (1) PERCENT GRADED TO DRAIN TO THE PRINCIPAL SPILLWAY.

are desirable.

GRAVEL (12"MIN. DEPTH)

SEDIMENT-LADEN RUNOFF REQUIRED DEPTH BELOW TOP OF INLET: -MIN. 1'--MAX. 2' LARGER PARTICLES WILL SETTLE STORM WATER WITH LARGER PARTICLES

CONCRETE GUTTER

(IP) GRAVEL CURB INLET SEDIMENT FILTER

SPECIFIC APPLICATION This method of inlet protection is applicable where heavy flows are expected and where an overflow capability and ease of maintenance

SPECIFIC APPLICATION

inconvenience or damage to adjacent

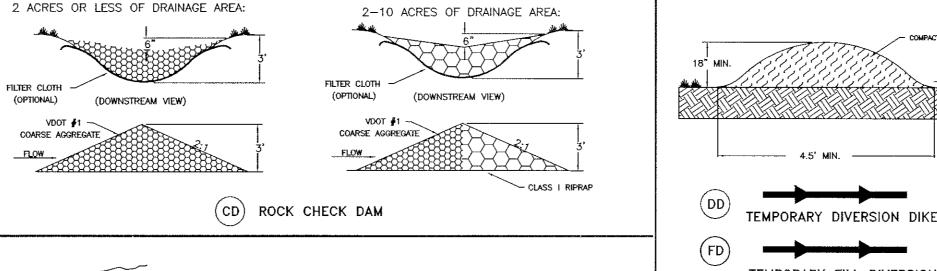
* Gravel shall be VDOT #3, #357 or 5

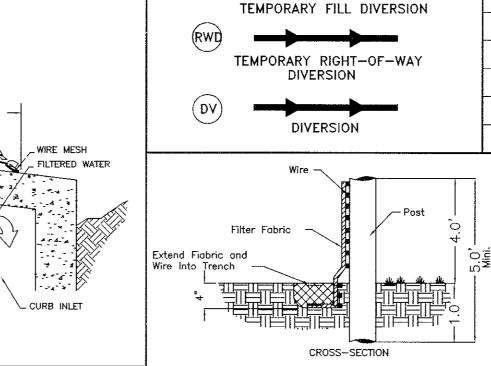
coarse aggregate.

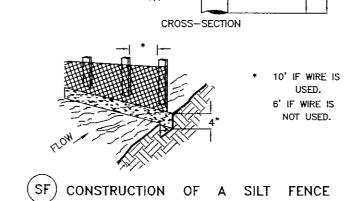
This method of inlet protection is applicable at curb inlets where ponding in front of

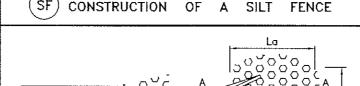
EXCAVATED DROP INLET SEDIMENT TRAP

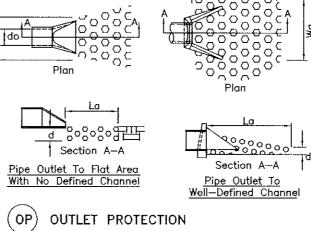
$N\square$ TITLE SYMBOL TITLE SYMBOL 3.01 SAFETY FENCE ROCK CHECK DAMS TEMPORARY GRAVEL LEVEL SPREADER CONSTRUCTION ENTRANCE VEGETATIVE STREAMBANK CONSTRUCTION ROAD 3.03 STABILIZATION STABILIZATION STRUCTURAL STREAMBANK STRAW BALE BARRIER STABILIZATION TEMPORARY VEHICULAR 3.05 SILT FENCE STREAM CROSSING BRUSH BARRIER 3.06 (20000000) UTILITY STREAM CROSSING STORM DRAIN 3.07 DEWATERING STRUCTURE INLET PROTECTION CULVERT INLET PROTECTION TURBIDITY CURTAIN SUBSURFACE DRAIN TEMPORARY DIVERSION DIKE TEMPORARY FILL DIVERSION SURFACE ROUGHENING ----(SR)------TEMPORARY RIGHT-OF-WAY TOPSOILING DIVERSION 3.12 DIVERSION TEMPORARY SEEDING ---(TS)---TEMPORARY SEDIMENT TRAP PERMANENT SEEDING ----(PS)-----TEMPORARY SEDIMENT BASIN 50 SODDING BERMUDA GRASS AND (B) OR TEMPORARY SLOPE DRAIN OYSIAURASS ESTABLISHMENT - (N) 3.16 PAVED FLUME MULCHING - (MU) --____ SOIL STABILIZATION STORMWATER CONVEYANCE CHANNEL BLANKETS AND MATTING TREES, SHRUBS, VINES OUTLET PROTECTION AND GROUND COVERS TREE PRESERVATION TP)----AND PROTECTION ______DC DUST CONTROL





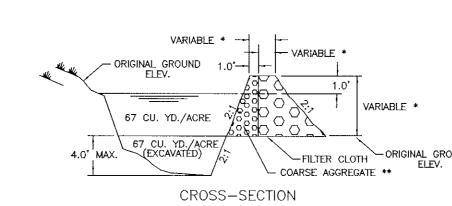


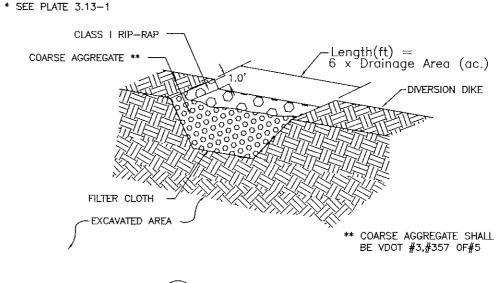




 Apron lining may be rip—rap, grouted np-rap, or concrete.

2. La is the length of the nprap apron as calculated using plates 1.36d and 1.36e. 3. d = 1.5 times the maximum stone diameter, but not less than 6".





ST) SEDIMENT TRAP

_ENGŢH

9.84

1.5' | 2.5'

For areas less than 3.0 acres. For areas larger than 3.0 acres, A SEDIMENT TRAP, is required Please see Va' ESC manual for design.

1.64

220

228

STRUCTUR

VARIABLE *	
4.0' MAX. (EXCAVATED) VARIABLE * 67 CU. YD./ACRE 67 CU. YD./ACRE COARSE AGGREGATE **	
CROSS-SECTION	
PLATE 3.13-1	
CLASS RIP-RAP	

450 3.00 1,350.00 DIVERSION DIKE TEMPORARY LF FILL DIVERSION SEDIMENT TRAP 500.00 500.00 CHECK DAM EΑ 1000 S 43 30.00 1,290.00 PERMANENT SEEDING DUTLET PROTECTION EΑ 100.00 100.00 SEDIMENT BASIN SUB-TOTAL \$9,050.00 10% CONTINGENCY \$ 905.00 TOTAL PROJECT COST ^{\$}9,955.00

EROSION-SILTATION CONTROL

COST ESTIMATE

QUANTITY

14

UNIT COST TOTAL COST

\$1,200.00 | \$_{1,200.00}

3.00

100.00

3,210.00

1,400.00

ALL COSTS GIVEN ARE COMPLETE IN PLACE

UNIT

EΑ

EΑ

DESCRIPTION

CONSTRUCTION

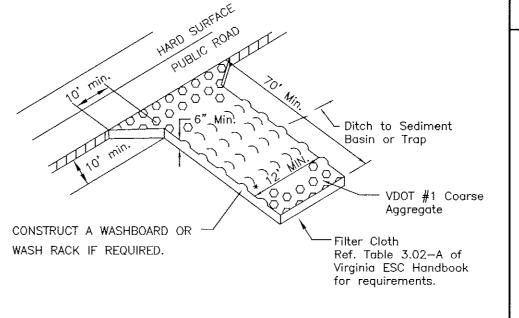
INLET PROTECTION

ENTRANCE

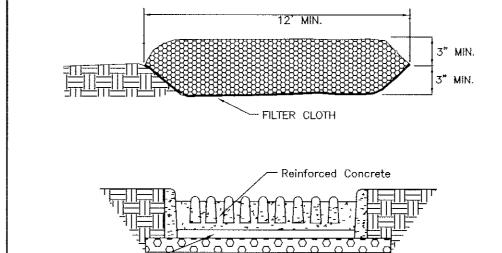
SILT FENCE

TEMPORARY SEDIMENT TRAP DATA WEIR HEIGHT (FT.) GENERAL EROSION AND SEDIMENT CONTROL NOTES

- 1. ALL SOIL EROSION & SEDIMENT CONTROL MEASURES SHALL BE ACCOMPLISHED IN STRICT ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
- THE APPROVING AUTHORITY MAY ADD TO, DELETE, RELOCATE, CHANGE, OR OTHERWISE MODIFY CERTAIN EROSION AND SEDIMENT CONTROL MEASURES WHERE FIELD CONDITIONS ARE ENCOUNTERED THAT WARRANT SUCH MODIFICATIONS.
- 3. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON THE PLAN SHALL BE PLACED IN ADVANCE OF THE WORK BEING PERFORMED, AS FAR AS
- 4. IN NO CASE DURING CONSTRUCTION SHALL WATER RUNOFF BE DIVERTED OR ALLOWED TO FLOW TO LOCATIONS WHERE ADEQUATE PROTECTION HAS NOT BEEN
- 5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADEQUATELY PROPERTY AT THE END OF EACH DAY'S WORK.
- 6. FOR THE EROSION CONTROL KEY SYMBOLS SHOWN ON THE PLANS, REFER TO THE VIRGINIA UNIFORM CODING SYSTEM FOR EROSION AND SEDIMENT CONTROL PRACTICES CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. THESE SYMBOLS AND KEYS ARE TO BE UTILIZED ON ALL EROSION CONTROL PLANS SUBMITTED TO ROANOKE COUNTY.



* MUST EXTEND FULL WIDTH OF INGRESS & EGRESS OPERATION.



WASH RACK DETAIL (IF REQUIRED)

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE PERMANENT SEEDING MIXTURE

TYPE B (SLOPES 3:1 OR STEEPER) 15 OCTOBER TO 1 FEBRUARY K-31 FESCUE @ 5 LB / 1000 SF CROWN VETCH @ 1/2 LB / 1000 SF PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF BORZY WINTER RYE @ 1/2 LB / 1000 SF RED TOP @ 1/8 LB / 1000 SF

1 FEBRUARY TO 1 JUNE K-31 FESCUE © 5 LB / 1000 SF ANNUAL RYE © 1/2 LB / 1000 SF 15 AUGUST TO 1 OCTOBER CROWN VETCH @ 1/2 LB / 1000 SF PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF 1 JUNE TO 1 SEPTEMBER RED TOP @ 1/8 LB / 1000 SF K-31 FESCUE @ 5 LB / 1000 SF GERMAN MILLET @ 1/2 LB / 1000 SF

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

140 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE FERTILIZER: 5-20-10 @ 25 LB / 1000 SF 38-0-0 @ 7 LB / 1000 SF

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

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.

TOTAL DISTURBED AREA = 2.00AC. = 87,120 SQ. FT.

DEPARTMENT ENGINEERING AND INSPECTIONS

This method of inlet protection is applicable where heavy concentrated flows are expected, but not where ponding around the structure might cause excessive inconvenience or damage

(IP) GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

SPECIFIC APPLICATION

to adjacent structures and unprotected areas.

* Gravel shall be VDOT #3, #357 or #5 coarse aggregate.

	1	ENGR. & INSPEC.	04-10-93
	2	ENGR. & INSPEC.	080593
Silver Si	3	ENGR. & INSPEC.	10-27-93
1	4		
	5		
Ĭ	6		
	NO.	REVISIONS	DATE

COUNTY OF ROANOKE

DATE: 11/02/93 SCALE: NO SCALE (G:\CAD\DETAILS\EROS) DRAWING BY: CLN,AF DESIGNED BY:

APPROVED BY: GWS,III

FIRST TEAM AUTO MALL **EROSION & SEDIMENT CONTROL** STORMWATER MANAGEMENT DETAILS

8 OF 13