

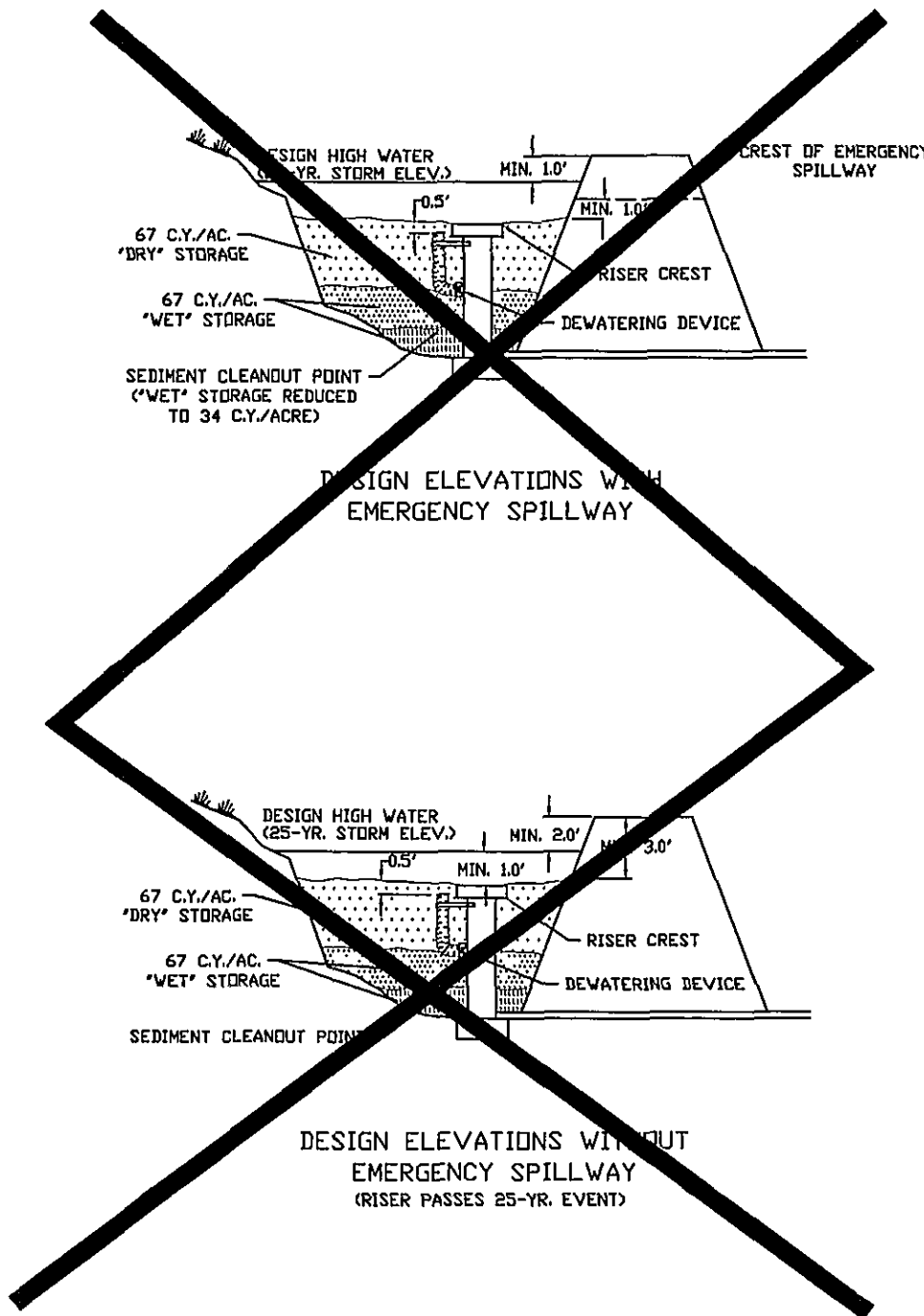
S:\2004 Projects\S04009-02-419 Member One Site Plan\dwg\S04009-02-419 Member One Site Plan.dwg (3) Jmg, C10 ESC DETAILS 5/19/2005 11:07:32 AM

## STORMWATER MANAGEMENT COST ESTIMATE

ALL COSTS GIVEN ARE COMPLETE IN PLACE

DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CLEARING & GRUBBING	LS		\$	\$
EXCAVATION	CY			
EMBANKMENT	CY			
FENCING	LF			
STRUCTURES				
ACCESS ROAD				
AS-BUILTS				
SUB-TOTAL				\$
10% CONTINGENCY				\$
TOTAL PROJECT COST				\$

## SEDIMENT BASIN SCHEMATIC ELEVATIONS

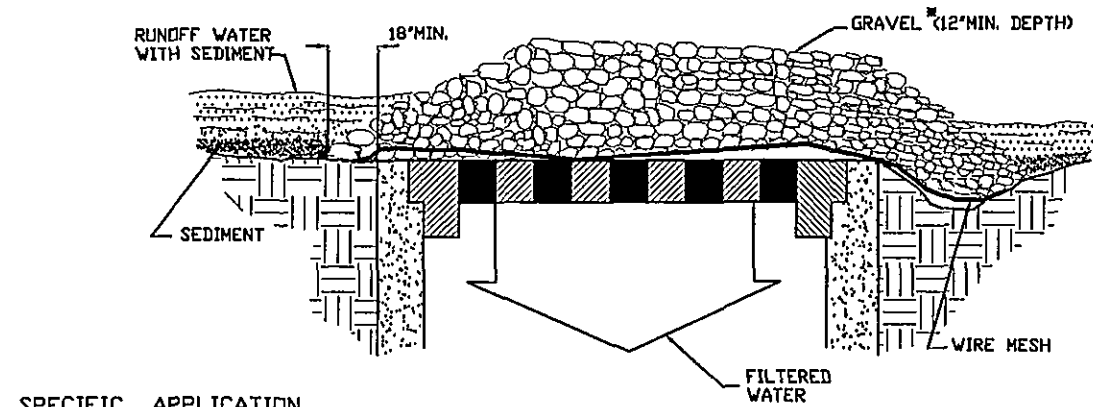


## GENERAL NOTES

- DESIGN OF DETENTION BASINS SHALL CONFORM TO THE REQUIREMENTS OF THE COUNTY OF ROANOKE DRAINAGE STANDARDS (REF. SECTIONS 50302, 50303, AND 50502). THE DESIGN OF THE FACILITY AND PREPARATION OF AS-BUILT PLANS SHALL BE BY A CERTIFIED PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE COMMONWEALTH OF VIRGINIA.
- ACCESS TO THE FACILITY MUST BE PROVIDED IN ACCORDANCE WITH THE COUNTY OF ROANOKE DESIGN AND CONSTRUCTION STANDARDS FOR DETENTION PONDS, LATEST EDITION.
- 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.
- 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.
- 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:
  - DIMENSIONS OF THE FACILITY
  - VOLUME @ MAXIMUM DEPTH
  - ELEVATIONS OF STRUCTURES, SPILLWAYS, AND TOP
  - MATERIALS VERIFICATION INCLUDING RESULTS OF DENSITY TESTS CONDUCTED BY AN INDEPENDENT SOIL TESTING LABORATORY
  - LOCATION AND ELEVATION OF BENCHMARK
- 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, LATEST EDITION.
- SLOPES STEEPER THAN 3 TO 1 (HORIZONTAL TO VERTICAL) SHALL BE BENCH OR STEPPED PRIOR TO PLACING FILL ON THEM.
- ON-SITE FILL MATERIAL OR BORROW FILL MATERIAL MAY BE UTILIZED. FILL MATERIAL SOILS, IN GENERAL:
  - SHALL BE COMPACTABLE
  - SHALL BE WITHIN AN ACCEPTABLE RANGE OF MOISTURE CONTENT WHICH IS READILY CONTROLLED
  - SHALL NOT BE HIGHLY SUSCEPTIBLE TO VOLUME CHANGE (SHRINKAGE OR SWELL) OR SETTLEMENT
- FILL MATERIALS CONTAINING ROCKS LARGER THAN SIX (6) INCHES (15.2 CM) SHALL NOT BE USED. THE UPPER TWO (2) FEET (61 CM) SHALL NOT HAVE ANY ROCK LARGER THAN TWO (2) INCHES (5.1 CM) IN DIAMETER.
- THE APPROVED FILL SHALL BE PLACED IN EIGHT (8) INCH (20 CM) LIFT 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.
- 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.
- 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 ACHIEVED.
- ANTI-SEEP COLLARS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
- ALL DISTURBED AREAS SHALL BE COVERED WITH FOUR (4) INCHES OF TOPSOIL AND SEEDED.
- THE MINIMUM SLOPE OF THE BASIN FLOOR SHALL BE ONE (1) PERCENT GRADED TO DRAIN TO THE PRINCIPAL SPILLWAY.



### SPECIFIC APPLICATION

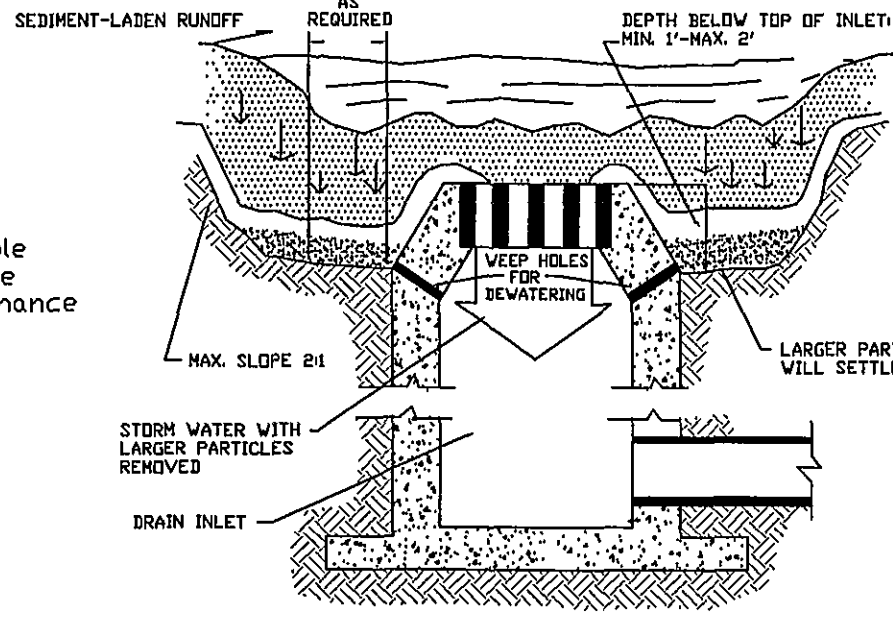
This method of inlet protection is applicable where heavy concentrated flows are expected, but not where ponding around the structure might cause excessive inconvenience or damage to adjacent structures and unprotected areas.

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

IP GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

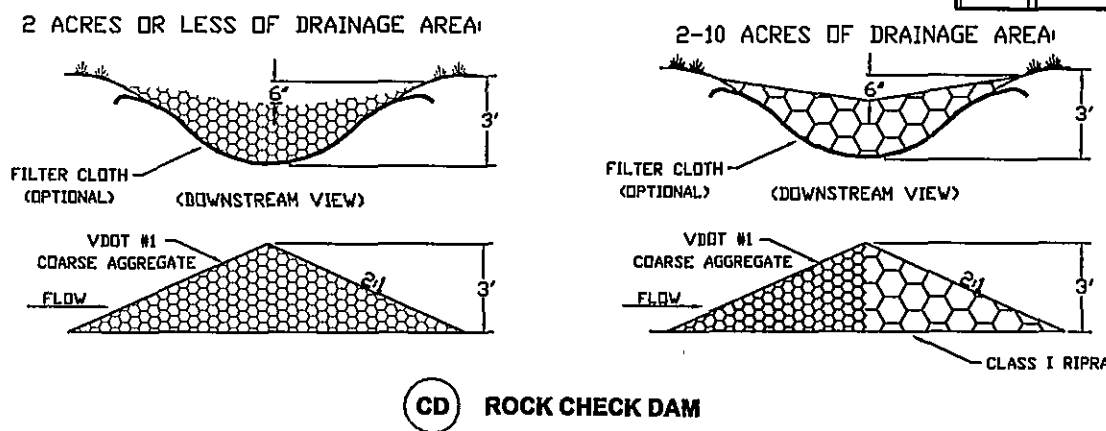
### SPECIFIC APPLICATION

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

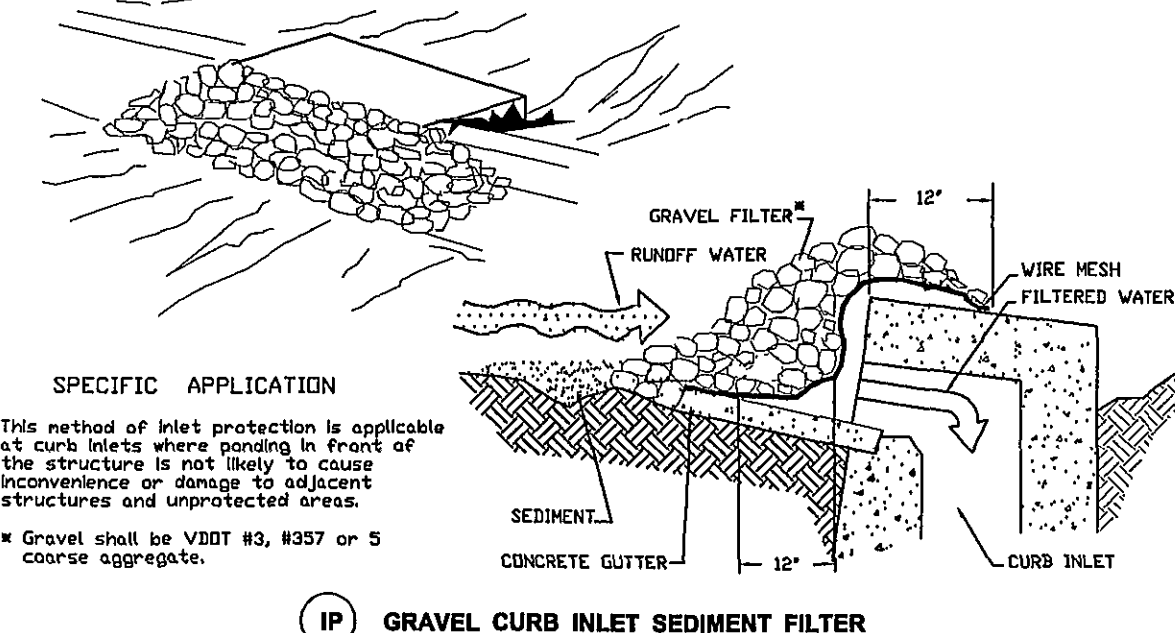


IP EXCAVATED DROP INLET SEDIMENT TRAP

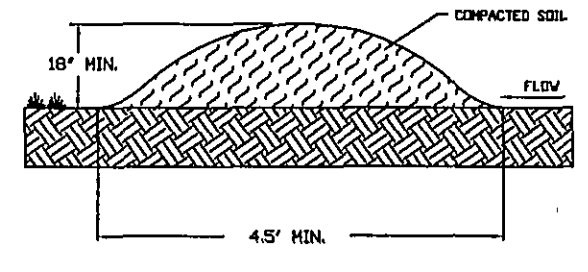
NO.	TITLE	KEY	SYMBOL	NO.	TITLE	KEY	SYMBOL
3.01	SAFETY FENCE	SAF	[Symbol]	3.20	ROCK CHECK DAMS	CD	[Symbol]
3.02	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE STABILIZATION	CE	[Symbol]	3.21	LEVEL SPREADER	LS	[Symbol]
3.03	STRAW BALE BARRIER	STB	[Symbol]	3.22	VEGETATIVE STREAMBANK STABILIZATION	VSS	[Symbol]
3.04	SILT FENCE	SF	[Symbol]	3.23	STRUCTURAL STREAMBANK STABILIZATION	SSS	[Symbol]
3.05	BRUSH BARRIER	BB	[Symbol]	3.24	TEMPORARY VEHICULAR STREAM CROSSING	VSC	[Symbol]
3.06	STORM DRAIN INLET PROTECTION	IP	[Symbol]	3.25	UTILITY STREAM CROSSING	USC	[Symbol]
3.07	CULVERT INLET PROTECTION	CIP	[Symbol]	3.26	DEWATERING STRUCTURE	DS	[Symbol]
3.08	TEMPORARY DIVERSION DIKE	DD	[Symbol]	3.27	TURBIDITY CURTAIN	TC	[Symbol]
3.09	TEMPORARY FILL DIVERSION	FD	[Symbol]	3.28	SUBSURFACE DRAIN	SD	[Symbol]
3.10	TEMPORARY RIGHT-OF-WAY DIVERSION	RWD	[Symbol]	3.29	SURFACE ROUGHENING	SR	[Symbol]
3.11	DIVERSION	DV	[Symbol]	3.30	TOPSOILING	TD	[Symbol]
3.12	TEMPORARY SEDIMENT TRAP	ST	[Symbol]	3.31	TEMPORARY SEEDING	TS	[Symbol]
3.13	TEMPORARY SEDIMENT BASIN	SB	[Symbol]	3.32	PERMANENT SEEDING	PS	[Symbol]
3.14	TEMPORARY SLOPE DRAIN	TSU	[Symbol]	3.33	SODDING	SD	[Symbol]
3.15	PAVED FLUME	PF	[Symbol]	3.34	BERMUDA GRASS AND ZOYSIAURASS ESTABLISHMENT	ZG	[Symbol]
3.16	STORMWATER CONVEYANCE CHANNEL	SCC	[Symbol]	3.35	MULCHING	MU	[Symbol]
3.17	OUTLET PROTECTION	OP	[Symbol]	3.36	SOIL STABILIZATION BLANKETS AND MATTING	BS	[Symbol]
3.18	RIPRAP	RR	[Symbol]	3.37	TREES, SHRUBS, VINES AND GROUND COVERS	VEG	[Symbol]
3.19				3.38	TREE PRESERVATION AND PROTECTION	TP	[Symbol]
				3.39	DUST CONTROL	DC	[Symbol]



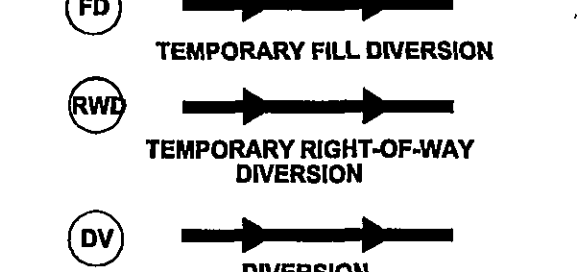
CD ROCK CHECK DAM



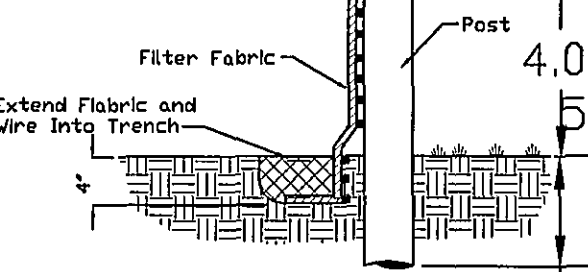
IP GRAVEL CURB INLET SEDIMENT FILTER



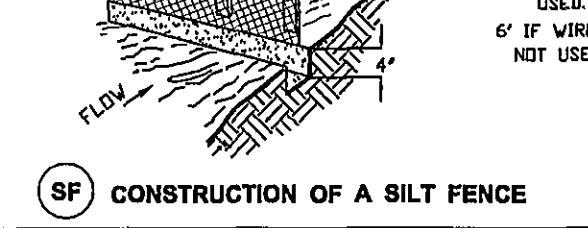
DD TEMPORARY DIVERSION DIKE



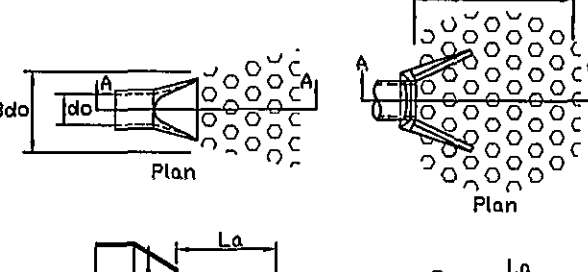
FD TEMPORARY FILL DIVERSION



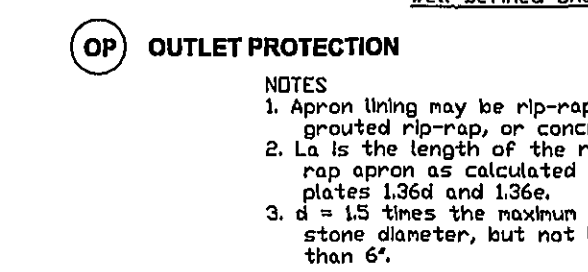
DV TEMPORARY RIGHT-OF-WAY DIVERSION



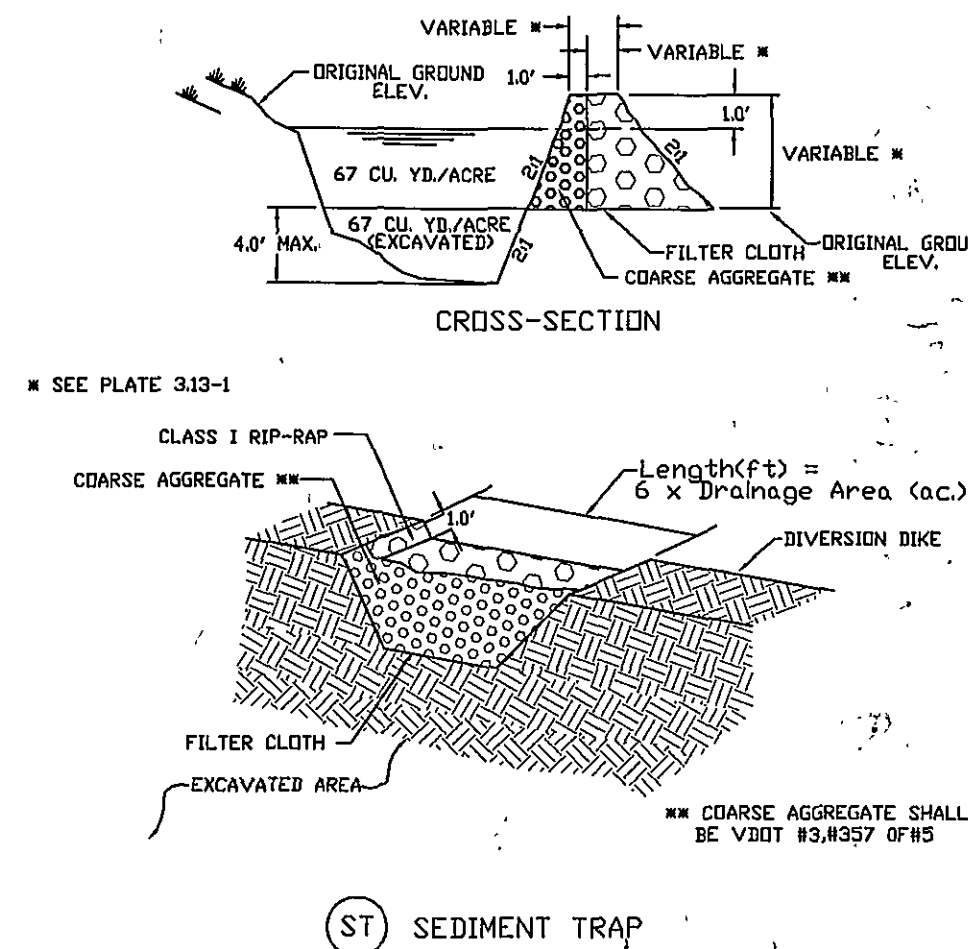
SF CONSTRUCTION OF A SILT FENCE



OP OUTLET PROTECTION



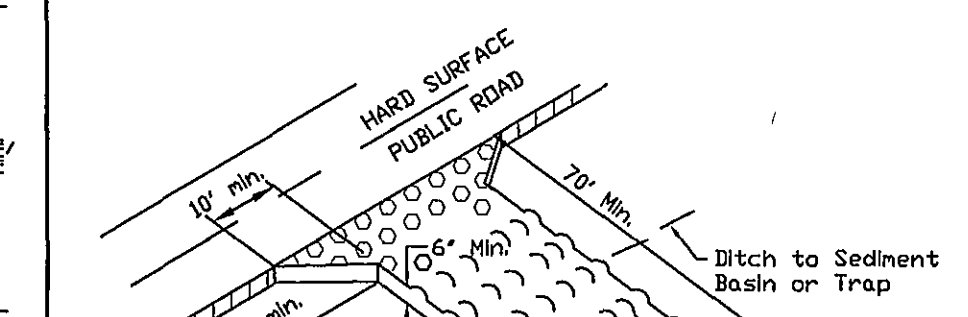
CE TEMPORARY GRAVEL CONSTRUCTION ENTRANCE



NOTE: FOR AREAS LESS THAN 3.0 ACRES, FOR AREAS LARGER THAN 30 ACRES A SEDIMENT BASIN IS REQUIRED. SEE DETAIL THIS SHEET.

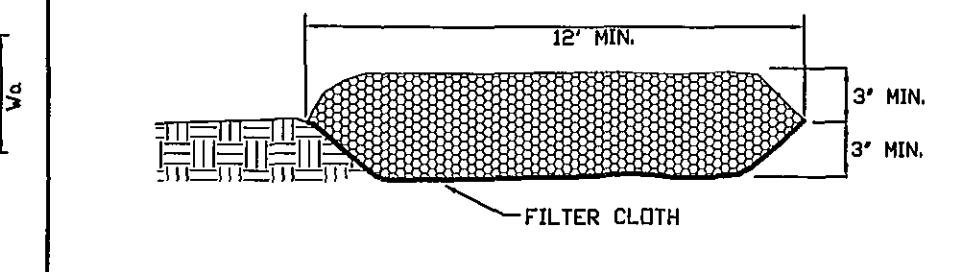
## TEMPORARY SEDIMENT TRAP DATA

STRUCTURE	DRAINAGE AREA (ACRES)	STORAGE (C.Y.)	WEIR LENGTH (FT.)	WEIR HEIGHT (FT.)	BERM HEIGHT (FT.)
ST #1	0.688	92.00	93.00	5	2



CONSTRUCT A WASHBOARD OR WASH RACK IF REQUIRED.

\* MUST EXTEND FULL WIDTH OF INGRESS & EGRESS OPERATION.



Filter Cloth Ref. Table 302-A of Virginia ESC Handbook for requirements.

WASH RACK DETAIL (IF REQUIRED)

## EROSION-SILTATION CONTROL COST ESTIMATE

ALL COSTS GIVEN ARE COMPLETE IN PLACE

DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CONSTRUCTION ENTRANCE	EA	1	\$ 1500	\$ 1,500
SILT FENCE	LF	579	\$ 3	\$ 1,737
INLET PROTECTION	EA	8	\$ 150	\$ 1,200
TEMPORARY DIVERSION DIKE	LF	248	\$ 3	\$ 744
TEMPORARY FILL DIVERSION	LF	0	\$ 0	\$ 0
SEDIMENT TRAP	EA	1	\$ 750	\$ 750
CHECK DAM	EA	0	\$ 0	\$ 0
PERMANENT SEEDING	1000 SF	29	\$ 30	\$ 879
OUTLET PROTECTION	EA	0	\$ 150	\$ 0
SEDIMENT BASIN	EA	0	\$ 0	\$ 0
SUB-TOTAL				\$ 6,810
10% CONTINGENCY				\$ 681
TOTAL PROJECT COST				\$ 7,491

## GENERAL EROSION AND SEDIMENT CONTROL NOTES

- 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.
- 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 PRACTICAL.
- IN NO CASE DURING CONSTRUCTION SHALL WATER RUNOFF BE DIVERTED OR ALLOWED TO FLOW TO LOCATIONS WHERE ADEQUATE PROTECTION HAS NOT BEEN PROVIDED.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADEQUATELY PROTECTED AGAINST EROSION, SEDIMENTATION, OR ANY DAMAGE TO ANY ADJACENT PROPERTY AT THE END OF EACH DAY'S WORK.
- 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.

## PERMANENT SEEDING MIXTURE

- TYPE A
- 15 OCTOBER TO 1 FEBRUARY  
K-31 FESCUE @ 5 LB / 1000 SF  
BIRDY WINTER RYE @ 1/2 LB / 1000 SF  
PERENNIAL RYEGRASS @ 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  
GERMAN MILLET @ 1/2 LB / 1000 SF
- 1 JUNE TO 1 SEPTEMBER  
K-31 FESCUE @ 5 LB / 1000 SF  
ANNUAL RYE @ 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 SEEDING 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 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, CULTIVATOR, SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.
- TOTAL DISTURBED AREA = 1.45 AC

## DEPARTMENT OF ENGINEERING AND INSPECTIONS

NO.	REVISIONS	DATE
1	ENGR. & INSP.	04-10-93
2	ENGR. & INSP.	09-05-93
3	ENGR. & INSP.	10-27-93
4		
5		
6		

## COUNTY OF ROANOKE

DATE: 11/02/93
SCALE: NO SCALE
DRAWN BY: CLM,AF
DESIGNED BY: G:CAD/DETAILS/EROSION/EROSION
APPROVED BY: GWS,III

## EROSION & SEDIMENT CONTROL STORMWATER MANAGEMENT DETAILS

Member One Federal Credit Union  
Route 419, Roanoke County  
Prepared for Thor, Inc.  
Windsor Hills Magisterial District  
Roanoke County, Virginia

REVISIONS:

County & VDOT Comments	March 29, 2005
County, VDOT, & WVA Comments	May 3, 2005
County Comments	May 10, 2005

DESIGNED BY: GST  
DRAWN BY: GST  
CHECKED BY: SRB  
SCALE: As Noted  
DATE: November 16, 2004

SHEET TITLE:  
Erosion & Sediment Control Details

C10  
10 OF 12  
PROJECT NUMBER:  
S04009-02