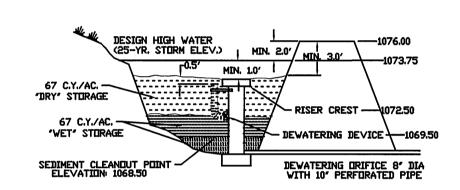
STORMWATER MANAGEMENT COST ESTIMATE ALL COSTS GIVEN ARE COMPLETE IN PLACE QUANTITY UNIT COST TOTAL COST DESCRIPTION 2,000 CLEARING & GRUBBING LS 0.50 4,000 CY 1,000 EXCAVATI□N 2.50 2,500 5.00 **EMBANKMENT** CY **500** 2,500 FENCING 10.00 LF 640 6,500 2,500 2,500 STRUCTURES ACCESS ROAD AS-BUILTS 1,000 1,000 SUB-TOTAL \$ 17,000 1,700 10% CONTINGENCY TOTAL PROJECT COST 18,700

SEDIMENT BASIN SCHEMATIC **ELEVATIONS**



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 ROANDKE 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
- 2. ACCESS TO THE FACILITY MUST BE PROVIDED IN ACCORDANCE WITH THE COUNTY OF ROANDKE 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 DIE DR MORE LOCKING DOUBLE GATES (MINIMUM TEN FEET WIDE) FOR ACCESS.
- 4. DETENTION PONDS SHALL BE BONDED IN ACCORDANCE WITH THE ROANDKE 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 ROANDKE 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
- 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

- 1. SITE PREPARATION SHALL BE IN ACCORDANCE WITH THE COUNTY OF ROANOKE DESIGN AND CONSTRUCTION STANDARDS FOR DETENTION PONDS,
- BENCHED OR STEPPED PRIOR TO PLACING FILL ON THEM.

2. SLOPES STEEPER THAN 3 TO 1 (HORIZONTAL TO VERTICAL) SHALL BE

- 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 WHICH IS READILY CONTROLLED SHALL NOT BE HIGHLY SUSCEPTIBLE TO VOLUME CHANGE

(SHRINKAGE OR SWELL) OR SETTLEMENT

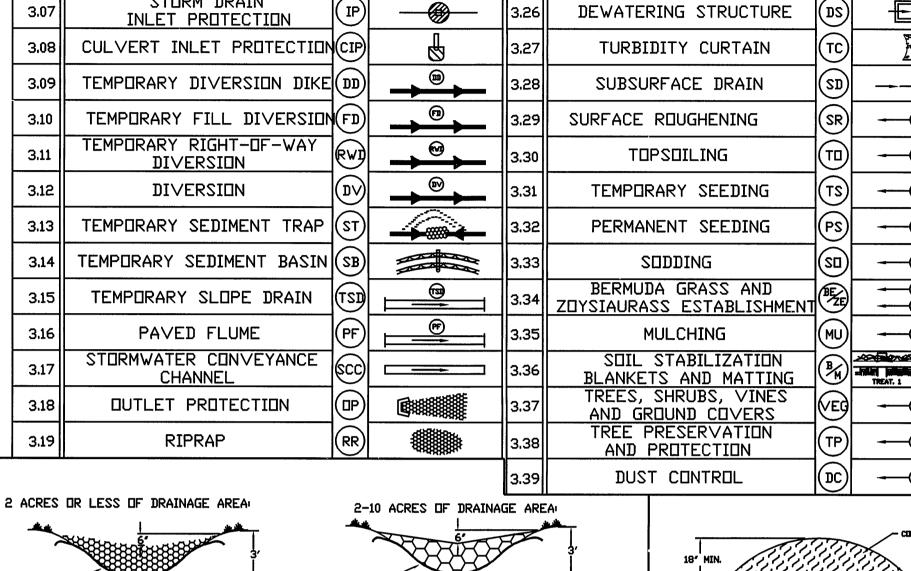
- 4. FILL MATERIALS CONTAINING ROCKS LARGER THAN SIX (6) INCHES (15.2 CM) SHALL NOT BE USED. THE UPPERMOST TWO (2) FEET (61
- 5. THE APPROVED FILL SHALL BE PLACED IN EIGHT (8) INCH (20 CM) LODSE LIFTS. EACH LIFT SHALL BE SPREAD IN UNIFORM LAYERS. FILL SOIL SHALL BE UTILIZED ONLY WITHIN A MOISTURE RANGE 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 f iSUBMITTED TO THE COUNTY OF ROANDKE 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 REVORKED 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.

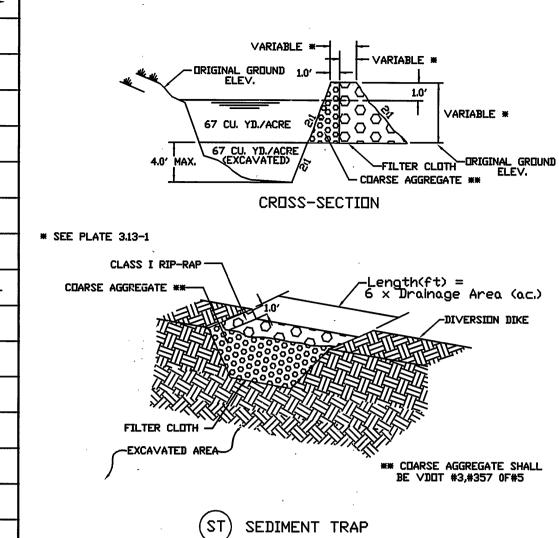
SPECIFIC APPLICATION

where heavy flows are expected and where

3.01 SAFETY FENCE ROCK CHECK DAMS TEMPORARY GRAVEL 3.02 LEVEL SPREADER CONSTRUCTION ENTRANCE CONSTRUCTION ROAD VEGETATIVE STREAMBANK 3.03 STABILIZATION STABILIZATION STRUCTURAL STREAMBANK 3.04 STRAW BALE BARRIER STABILIZATION TEMPORARY VEHICULAR 3.05 SILT FENCE STREAM CROSSING BRUSH BARRIER 3.06 UTILITY STREAM CROSSING (US STORM DRAIN **₽** 3.07 DEWATERING STRUCTURE INLET PROTECTION 3.08 CULVERT INLET PROTECTION(CIF TURBIDITY CURTAIN TEMPORARY DIVERSION DIKE (DD SUBSURFACE DRAIN TEMPORARY FILL DIVERSION(FI SURFACE ROUGHENING TEMPORARY RIGHT-OF-WAY € 3.11 TOPSOILING DIVERSION 3.12 DI∨ERSI□N TEMPORARY SEEDING ----(13)--- 3.13 TEMPORARY SEDIMENT TRAP PERMANENT SEEDING TEMPORARY SEDIMENT BASIN (S) SODDING ----(SD)----BERMUDA GRASS AND TEMPORARY SLOPE DRAIN 'OYSIAURASS ESTABLISHMENT 3.16 PAVED FLUME MULCHING T□RMWATER C□N∨EYANCE SOIL STABILIZATION 3.17 13.36 BLANKETS AND MATTING CHANNEL REES, SHRUBS, VINES OUTLET PROTECTION 3.18 AND GROUND COVERS TREE PRESERVATION 3.19 **RIPRAP** AND PROTECTION



(DUWNSTREAM VIEW)



SYMBUL

TITLE

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.

0.45

STRUCTUR

EROSION-SILTATION CONTROL COST ESTIMATE

ALL COSTS GIVEN ARE COMPLETE IN PLACE				
DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CONSTRUCTION ENTRANCE	EA	1	\$ 1,000	\$ 1,000
SILT FENCE	LF	482	2.00	964.00
INLET PROTECTION	EA	4	100	400.00
TEMP□RARY DI∨ERSI□N DIKE	LF	517	2.00	1,034
TEMPORARY FILL DIVERSION	LF			
SEDIMENT TRAP	EA	1	1,500	1,500
CHECK DAM	EA	. 11	50	550
PERMANENT SEEDING	1000 SF	250	20	5000
OUTLET PROTECTION	EA	2	200	400 .
SEDIMENT BASIN	EA	. 1	500	500
RIGHT □F WAY DI∨ERSI□N	EA	1	50	50
TEMPORARY SEEDING	1000 SF	250	20	5000
SUB-TOTAL				\$ 16,398
0% CONTINGENCY			\$ 1,639	
TOTAL PROJECT COST			\$ 18,037	

TEMPORARY SEDIMENT TRAP DATA

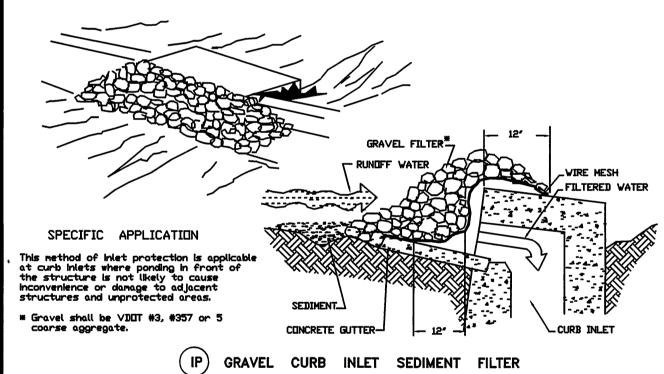
STORAGE (C.Y.)

61

L ALL SOIL EROSION & SEDIMENT CONTROL MEASURES SHALL BE ACCOMPLISHED IN STRICT ACCURDANCE WITH THE STANDARDS AND SPECIFICATIONS CONTAINED

GENERAL EROSION AND SEDIMENT CONTROL NOTES

- IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. 2. THE APPRO∨ING 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
- 4. IN NO CASE DURING CONSTRUCTION SHALL WATER RUNDFF 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 PROTECTED AGAINST EROSION, SEDIMENTATION, OR ANY DAMAGE TO ANY ADJACENT
- 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 ROANDKE COUNTY.



(CD) ROCK CHECK DAM

FILTER CLUTH-

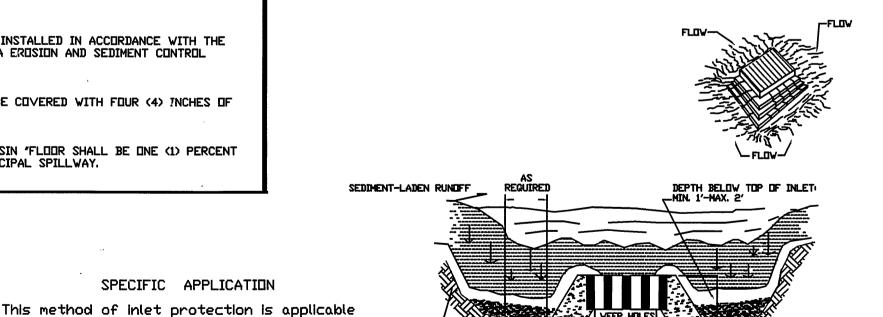
(OPTIONAL)

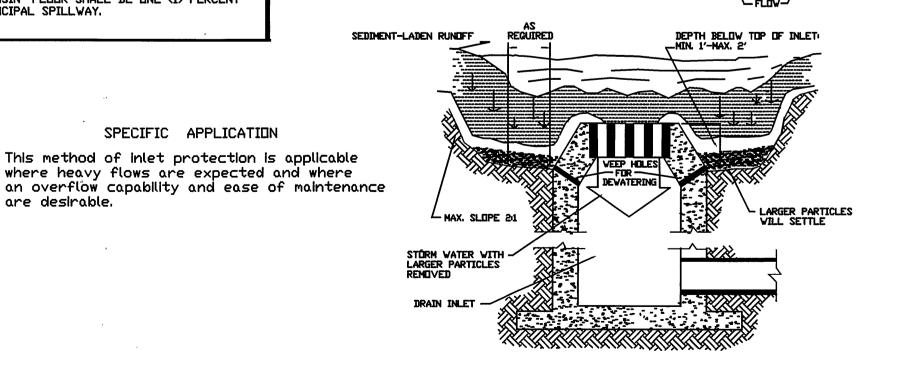
(DUWNSTREAM VIEW)

(OPTIONAL)

COARSE AGGREGATE

TITLE





CRUSS-SECTION # 10' IF WIRE IS 6' IF WIRE IS NOT USED. (SF) CONSTRUCTION OF A SILT FENCE 0,000 Section A-A <u>Pipe Dutlet To Flat Area</u> <u>With No Defined Channel</u> Section A-A <u>Pipe Butlet</u> To <u>Well-Defined Chan</u>nel OP) OUTLET PROTECTION 1. Apron lining may be rip-rap, grouted rip-rap, or concrete.
2. La is the length of the rip-rap apron as calculated using plates 1.36d and 1.36e.

3. d = 1.5 times the maximum stone diameter, but not less

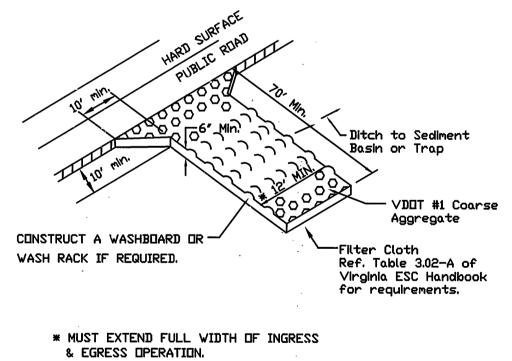
TEMPORARY DIVERSION DIKE

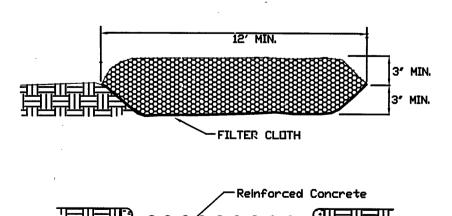
TEMPORARY FILL DIVERSION

TEMPORARY RIGHT-OF-WAY

DIVERSION

DIVERSION





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WASH RACK DETAIL (IF REQUIRED)

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE PERMANENT SEEDING MIXTURE

TYPE B (SLUPES 3:1 UR STEEPER) 15 OCTOBER TO 1 FEBRUARY 15 MARCH TO 1 MAY CROWN VETCH @ 1/2 LB / 1000 SF F PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF RED TOP @ 1/8 LB / 1000 SF K-31 FESCUE @ 5 LB / 1000 SF BURZY WINTER RYE @ 1/2 LB / 1000 SI 1 FEBRUARY TO 1 JUNE K-31 FESCUE @ 5 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 ANNUAL RYE @ 1/2 LB / 1000 SF

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

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 APPLIED IN ACCORDANCE WITH SECTION 1.75 OF THE VIRGINIA EROSION MULCH AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

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

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 = 5.85 AC. = 254,826 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 VDDT #3, #357 or #5 coarse aggregate.

1	ENGR. & INSPEC.	04-10-93
2	ENGR. & INSPEC.	08-05-93
3	ENGR. & INSPEC.	10-27-93
4		
5		
6		
NO.	REVISIONS	DATE

COUNTY ROANOKE

EXCAVATED DROP INLET SEDIMENT TRAP

ATE: 11/02/93					
CALE:	NO S	CALE			
RAWING	BY:	CLN,AF	(G:\CAD\DETAILS\EROS)		
ESIGNED	BY:				
PPROVE	D BY:	GWS.III			

CARRIAGE PARK **EROSION & SEDIMENT CONTROL** STORMWATER MANAGEMENT DETAILS