

ALL COSTS GIVEN ARE COMPLETE, IN PLACE				
DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CLEARING & GRUBBING	LS	---	\$ 45,000	\$ 0
EXCAVATION	CY	0	4.00	0
EMBANKMENT	CY	0	4.00	0
FENCING	LF	0	12.00	0
STRUCTURES		0	VARIES	0
ACCESS ROAD		0	VARIES	0
AS-BUILTS		0	VARIES	0
SUB-TOTAL				\$ 0
10% CONTINGENCY				\$ 0
TOTAL PROJECT COST				\$ 0

1. DESIGN OF DETENTION BASINS SHALL CONFORM TO THE REQUIREMENTS OF THE COUNTY OF ROCKWOLD DRAINAGE STANDARDS (REF. SECTIONS 020400 AND 020500). 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.
2. ACCESS TO THE FACILITY MUST BE PROVIDED IN ACCORDANCE WITH THE COUNTY OF ROCKWOLD DESIGN AND CONSTRUCTION STANDARDS FOR DETENTION POND, LATEST EDITION.
3. IF THE FACILITY IS OVER FOUR (4) FEET DEEP, TAKES OVER TWO (2) HOURS TO BRAIN, OR THE INTERIOR SLOPE EXCEEDS 3:1 (V:H), PERMANENT FENCING MUST BE REQUIRED, ADDITIONALLY, IF THE FACILITY IS IN A KNOWN OR SUSPECTED FLOOD AREA, IT MAY PRESENT A HAZARD TO THE GENERAL PUBLIC, FENCING MAY BE REQUIRED. FENCING SHALL BE A MINIMUM OF 4 FEET HIGH, OF A TYPE OF STANDARD NINE GAUGE LINK FENCE, AND MUST HAVE ONE OR MORE LOCKING DOUBLE GATES (MINIMUM TEN FEET WIDE) FOR ACCESS.
4. DETENTION POND SHALL BE BONDED IN ACCORDANCE WITH THE ROCKWOLD COUNTY BONDING POLICY FOR SUBDIVISION AND SITE DEVELOPMENT. A SURVEY OF THE FACILITY SHALL BE REQUIRED AND ADMINISTERED APART FROM THE SUBDIVISION DEVELOPMENT BOND. REFERENCE ESTIMATE - THIS SHEET.
5. REFERENCE THE COUNTY OF ROCKWOLD DESIGN AND CONSTRUCTION STANDARDS FOR DETENTION POND, LATEST EDITION, FOR ACCEPTANCE AND VERIFICATION OF 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
6. MATERIALS VERIFICATION INCLUDING RESULTS OF DENSITY TESTS CONDUCTED BY AN INDEPENDENT SOIL TESTING LABORATORY
7. LOCATION AND ELEVATION OF BENCHMARK.

DESIGN HIGH WATER
60-YR. STORM ELEV.

67 C.Y./AC.
"DRY" STORAGE

67 C.Y./AC.
"WET" STORAGE

SEDIMENT CLEANOUT POINT

MIN. 2.0'

MIN. 1.0'

MIN. 3.0'

RISER CREST

DEWATERING DEVICE

DESIGN ELEVATIONS WITHOUT
EMERGENCY SPILLWAY
CROSS PASSAGE 25-YR. EVENT

DEPARTMENT
OF
ENGINEERING AND INSPECTIONS

1		
2		
3		
4		
5		
6		
NO.	REVISIONS	DATE

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

1. SITE PREPARATION SHALL BE IN ACCORDANCE WITH THE COUNTY OF ROCKWIDE DESIGN AND CONSTRUCTION STANDARDS FOR DETENTION POND'S LATEST EDITION.

2. SLOPES STEEPER THAN 3 TO 1 (HORIZONTAL TO VERTICAL) SHALL BE BENCHES OR STEPPED PRIOR TO PLACING FILL ON THEM.

3. ON-SITE FILL MATERIAL OR BORROW FILL MATERIAL MAY BE UTILIZED. FILL MATERIAL SOLIDS, IN GENERAL:

- A. SHALL BE COMPACTABLE
- B. SHALL BE WITHIN AN ACCEPTABLE RANGE OF MOISTURE CONTENT
- C. SHALL BE EASILY COMPACTED BY VIBRATION
- D. SHALL NOT BE HIGHLY SUSCEPTIBLE TO CLIMATE CHANGE (SHRINKAGE OR SWELL) OR SETTLEMENT

4. FILL MATERIALS CONTAINING ROCKS LARGER THAN SIX (6) INCHES (USE CHD SHALL NOT BE USED, THE UPPERMOST TWO (2) FEET F61 CHD SHALL BE USED) MAY HAVE ROCK LARGER THAN TWO (2) INCHES (S1 CHD IN DIAMETER.

5. THE APPROVED FILL SHALL BE PLACED IN EIGHT (8) INCH (20 CHD) LODES/LIFTS. EACH LIFT SHALL BE SPREAD IN UNIFORM LAYERS. FILL SOIL SHALL BE UTILIZED ONLY WITHIN A MISTURE RANGE OF 1% TO 3% MOISTURE. COMPACTED TO 95% OF THE THEORETICAL DENSITY. FILL SHALL BE PERFORMED WITH APPROPRIATE EQUIPMENT. COMPACTON OF THE LAYERS SHALL BE CONTINUOUS AND UNIFORM.

6. ENHANCEMENT MATERIAL IN FILL AREAS SHALL BE PLACED IN LIFTS NOT EXCEEDING EIGHT (8) INCHES AND SHALL BE COMPACTED TO A MINIMUM 95% OF THEORETICAL DENSITY IN ACCORDANCE WITH SECTION 903 OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS.

7. FIELD DENSITY TESTS ARE TO BE CONDUCTED BY AN INDEPENDENT GEOTECHNICAL ENGINEER. THE RESULTS OF THESE TESTS SHALL BE SUBMITTED TO THE COUNTY ENGINEER FOR REVIEW AND APPROVAL. THE RESULTS SHALL BE A CONDITION OF ACCEPTANCE OF THE FACILITY BY THE COUNTY. FIELD DENSITY TESTS SHALL BE CONDUCTED BY THE ENGINEER SHALL BE PERFORMED PERIODICALLY TO DETERMINE THE DEGREE OF COMPACTON. ANY AREAS FAILING TO MEET THE ABOVE REQUIREMENTS SHALL BE REWORKED AND RECOMPACTED UNTIL THE REQUIRED DEGREE OF COMPACTON IS ACHIEVED.

8. ANTI-SEEP COLLARS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE VIRGINIA REGIONAL DESIGN 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 PERIMETER SPILLWAY.

Figure 10.10 shows two typical cross-sections of rock check dams, labeled (a) and (b). Both sections have a height y and a width x . Section (a) is labeled "COARSE AGGREGATE" and "FLUW". Section (b) is labeled "CLASS 1 REPAIR" and "FLUW". Both sections show a filter cloth (optional) at the top and a coarse aggregate layer at the bottom. The filter cloth is labeled "FILTER CLOTH (OPTIONAL)" and "COASTDOWN VIEW".

The diagram illustrates a curb inlet installation. On the left, a cross-section shows runoff water flowing over a gravel filter. A wire mesh is positioned above the filter, with filtered water passing through it into the curb inlet. The curb inlet is shown as a concrete structure with a curb. The gravel filter is labeled 'GRAVEL FILTER' and the wire mesh is labeled 'WIRE MESH'. The filtered water is labeled 'FILTERED WATER'. The runoff water is labeled 'RUNOFF WATER'. The curb inlet is labeled 'CURB INLET'. The gravel filter is shown with a 12" depth. The curb inlet is shown with a 12" depth. The gravel filter is shown with a 12" depth. The curb inlet is shown with a 12" depth.

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, #57 or 5 coarse aggregate.

IP GRAVEL CURB INLET SEDIMENT FILTER

The diagram illustrates the design of an excavated drop inlet sediment trap. It includes a plan view at the top showing the inlet structure with flow direction indicated by arrows labeled 'FLOW'. The plan view shows a rectangular inlet with a central 'DROP INLET' and a 'SEWERTWINE' (sewer line) passing through it. The inlet is surrounded by a 'SEDIMENT-LADEN RING' and a 'DEPTH BELOW TOP OF INLET' is specified as 'MIN. 1'-0" MAX. 2' - 0"'. The cross-section view below shows the inlet structure with a 'MAX. SLOPE 2:1' and a 'DRAIN INLET' at the bottom. The cross-section also shows 'STORM WATER WITH LARGER PARTICLES REMOVED' and 'LARGER PARTICLES WILL SETTLE' in the trap area. The diagram is labeled 'IP EXCAVATED DROP INLET SEDIMENT TRAP' at the bottom.

TITLE	KEY	SYMBOL
ROCK CHECK DAMS	CD	
LEVEL SPREADER	LS	
VEGETATIVE STREAMBANK STABILIZATION	VSS	
STRUCTURAL STREAMBANK STABILIZATION	SSS	
TEMPORARY VEHICULAR STREAM CROSSING	VSC	
UTILITY STREAM CROSSING	USC	
DEWATERING STRUCTURE	DS	
TURBIDITY CURTAIN	TC	
SUBSURFACE DRAIN	SD	
SURFACE ROUGHENING	SR	
TOPSOILING	TS	
TEMPORARY SEEDING	TD	
PERMANENT SEEDING	PS	
SODDING	SO	
BERMUDA GRASS AND HYSSAUSS ESTABLISHMENT	BS	
MULCHING	MU	
SOIL STABILIZATION BLANKETS AND MATTING	SM	
TREES, SHRUBS, VINES AND GROUND COVERS	TP	
TREE PRESERVATION AND PROTECTION	VE	
DUST CONTROL	DC	

Diagram illustrating a cross-section of a sediment trap system. The diagram shows a cross-section of a trap with a 'CLASS 1 RIP-RAP' layer on top, followed by a 'COARSE AGGREGATE' layer. Below this is a 'FILTER CLOTH' layer, and at the bottom is an 'EXCAVATED AREA'. A 'DIVERSION DIKE' is shown on the right side. The diagram is labeled 'CROSS-SECTION' and includes dimensions: '4.0' MAX.' for the width of the aggregate layer, '1.0'' for the height of the aggregate layer, and '1.0'' for the height of the filter cloth layer. A note indicates '67 CU YD/ACRE' for the aggregate and '67 CU YD/ACRE' for the filter cloth. A note also states 'Length(Ft) = 6 x Drainage Area (ac.)'. A note at the bottom right says 'COARSE AGGREGATE SHALL BE VISIT RATED 0.75'.

[illegible]

18' H_{DN}

4.5' H_{DN}

TEMPORARY FILL DIVERSION

TEMPORARY RIGHT-OF-WAY DIVERSION

DIVERSION

DD

FD

RWD

DV

CROSS-SECTION

Wire
Filter Fabric
Trench
Post
4'
5'
3'

PLAN VIEW

10'
6'
4'
FLOW

■ 10' IF WIRE USED
■ 6' IF WIRE NOT USED

(SF) CONSTRUCTION OF A SILT FENCE

The diagrams illustrate outlet protection for two different ground conditions:

- Plan View (Flat Area):** Shows a rectangular outlet with a length L_o and a width d . A protective apron of length L_a extends from the outlet. The apron is divided into a top section of length L_{a1} and a bottom section of length L_{a2} . The apron is made of plates 156d and 156e.
- Section A-A (Sloped Area):** Shows a cross-section of the outlet and apron. The apron is made of plates 156d and 156e. The apron is divided into a top section of length L_{a1} and a bottom section of length L_{a2} . The apron is made of plates 156d and 156e.

Plan - Outlet to Flat Area
Section A-A

Plan - Outlet to Sloped Area
Section A-A

NOTES

1. Apron Using may be rib-rap, grouted rib-rap, or concrete.
2. L_a is the length of the rib-rap apron as calculated in plates 156d and 156e.
3. $d = 1.5$ times the stone diameter, but not less than 18 inches.

ALL COSTS GIVEN ARE COMPLETE IN PLACE				
DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CONSTRUCTION ENTRANCE	EA		\$	\$
SILT FENCE	LF	993	6.00	5,960
INLET PROTECTION	EA			
CHECK DAM	EA			
PERMANENT SEEDING	1000 SF			
OUTLET PROTECTION	EA			
TREE PROTECTION	LF	650	4.00	2,600
SUB-TOTAL				\$ 8,560
10% CONTINGENCY				\$ 860
TOTAL PROJECT COST				\$ 9,420

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.

2. THE APPROVING AUTHORITY MAY AND TO, REJECT, RELOCATE, CHANGE, OR OTHERWISE MODIFY CERTAIN EROSION AND SEDIMENT CONTROL MEASURES WHERE THEY CONFLICTS ARE DETERMINED THAT SUCH MODIFICATIONS ARE NECESSARY.

3. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE IN PLACE AND PLAN SHALL BE PLACED IN ADVANCE OF THE WORK BEING PERFORMED, AS FAR AS PRACTICAL.

4. IN NO CASE DURING CONSTRUCTION SHALL WATER RUNOFF BE DIVERTED OR ALLOWED TO FLOW TO LOCATIONS WHERE ADEQUATE PROTECTION HAS NOT BEEN PROVIDED.

5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADEQUATELY PROTECTED AGAINST EROSION OR ANY DAMAGE TO ANY ADJACENT PROPERTY AT THE END OF EACH DAY'S WORK.

6. FOR THE EROSION CONTROL KEY SYMBOLS SHOWN ON THE PLANS, REFER TO THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. THESE SYMBOLS AND KEYS ARE TO BE UTILIZED ON ALL EROSION CONTROL MEASURES.

TYPE A		TYPE B (CLASSES 34 OR STEEPER)	
15 OCTOBER TO 1 FEBRUARY	15 MARCH TO 1 MAY		
K-31 FESCUE @ 5 LB / 1000 SF	CROWN VETCH @ 1/2 LB / 1000 SF		
BORZY WINTER RYE @ 1/2 LB / 1000 SF	PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF		
	RED TOP @ 1/2 LB / 1000 SF		
K-31 FESCUE @ 5 LB / 1000 SF	15 AUGUST TO 1 OCTOBER		
ANNUAL RYE @ 1/2 LB / 1000 SF	CROWN VETCH @ 1/2 LB / 1000 SF		
	PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF		
1 JUNE TO 1 SEPTEMBER	RED TOP @ 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			
LIME: 150-10 @ 100 LB / 500 SF POLYMERIZED AGRICULTURAL LIMESTONE			
FERTILIZER:	20-20-10 @ 25 LB / 1000 SF		
	30-0-0 @ 7 LB / 1000 SF		
MULCH: IF REQUIRED, SHALL BE USED OVER ALL SEEDED AREAS AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 1.2.5 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 SEEDINGS, 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, CATTLEPICKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED, MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.			
TOTAL DISTURBED AREA = 3.46 AC. = 147,670 SQ. FT.			

DATE: 11/02/93
SCALE: NO SCALE
DRAWING BY: KDS
DESIGNED BY: KDS
APPROVED BY:

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