

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				\$

Diagram illustrating the design elevations with emergency spillway. The diagram shows a cross-section of a spillway structure with various storage areas and dimensions.

- DESIGN HIGH WATER (25-yr. STORM S.C.V.)**: Indicated by a dashed line at the top left.
- MIN. 10'**: Minimum height dimension for the crest and riser.
- CREST ST**: Crest station line.
- 0.5'**: Dimension for the riser crest.
- RISER CREST**: The vertical structure of the spillway.
- DEWATERING DEVICE**: Located at the base of the riser crest.
- C.V./AC STORAGE**: Storage area above the riser crest.
- 0.7 C.V./AC**: Storage area below the riser crest.
- 1" STORAGE**: Storage area below the riser crest.
- WENT CLEANOUT POINT**: Indicated by a dashed line at the bottom left.
- 1" STORAGE, REDUCED TO 34 C.V./AC/RE**: Storage area below the riser crest.

DESIGN ELEVATIONS WITH EMERGENCY SPILLWAY

[illegible]

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

1. DESIGN OF DETENTION BASINS SHALL CONFORM TO THE REQUIREMENTS OF THE COUNTY OF ROCKHIDE 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 OF VIRGINIA.
2. ACCESS TO THE FACILITY MUST BE PROVIDED IN ACCORDANCE WITH THE COUNTY OF ROCKHIDE 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 (V) : 1 (H), 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 ROCKHIDE 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 ROCKHIDE 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.

1. SITE PREPARATION SHALL BE IN ACCORDANCE WITH THE COUNTY OF RICHIE DESIGN AND CONSTRUCTION STANDARDS FOR DETENTION PONDS, LATEST EDITION.
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:
 - A. SHALL BE COMPACTABLE.
 - B. SHALL BE WITHIN AN ACCEPTABLE RANGE OF MOISTURE CONTENT WHICH IS READILY CONTROLLED.
 - 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) FEET (61 CM) SHALL NOT HAVE ANY ROCK LARGER THAN TWO (2) INCHES (5.1 CM) IN DIAMETER.
5. THE APPROVED FILL SHALL BE PLACED IN EIGHT (8) INCH (2 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 RICHIE WITH AS-BUILT PLANS AS A CONDITION OF ACCEPTANCE. TO BE SILEILY 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.
8. ANTI-SLEEP 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 SEED.
10. THE MINIMUM SLOPE OF THE BASIN FLOOR SHALL BE ONE (1) PERCENT GRADED TO DRAIN TO THE PRINCIPAL SPILLWAY.

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

Diagram illustrating an excavated drop inlet sediment trap. The structure is shown in cross-section, featuring a vertical drop inlet and a horizontal settling chamber. Key components and labels include:

- SEDIMENT-LADEN RUNOFF**: Indicated by arrows entering the trap from the top left.
- REQUIRED**: A vertical line indicating the required depth of the trap.
- DEPTH BELOW TOP OF INLET: MIN. 1'-MAX. 6'**: A dimension indicating the depth of the settling chamber.
- MAX. SLOPE 2:1**: A label indicating the maximum slope of the trap walls.
- KEEP HOLES FOR DEWATERING**: A label pointing to the bottom of the trap, indicating the need for holes to allow water to drain.
- LARGER PARTICLES WILL SETTLE**: A label indicating the purpose of the trap.
- STORM WATER WITH LARGER PARTICLES REMOVED**: A label indicating the output of the trap.
- DRAIN INLET**: A label pointing to the bottom of the trap.

The diagram shows the trap is excavated into the ground, with a concrete or masonry structure forming the walls and bottom. The runoff enters from the top, and the water level is shown settling, with larger particles settling to the bottom. The water then drains out through the bottom inlet.

3.01	SAFETY FENCE	(SAF)	
3.02	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE	(CE)	
3.03	CONSTRUCTION ROAD STABILIZATION	(CRS)	
3.04	STRAW BALE BARRIER	(STB)	
3.05	SILT FENCE	(SF)	
3.06	BRUSH BARRIER	(BB)	
3.07	STORM DRAIN INLET PROTECTION	(IP)	
3.08	CULVERT INLET PROTECTION	(CIP)	
3.09	TEMPORARY DIVERSION DIKE	(DD)	
3.10	TEMPORARY FILL DIVERSION	(FD)	
3.11	TEMPORARY RIGHT-OF-WAY DIVERSION	(RWI)	
3.12	DIVERSION	(DV)	
3.13	TEMPORARY SEDIMENT TRAP	(ST)	
3.14	TEMPORARY SEDIMENT BASIN	(SB)	
3.15	TEMPORARY SLOPE DRAIN	(TSD)	
3.16	PAVED FLUME	(PF)	
3.17	STORMWATER CONVEYANCE CHANNEL	(SCC)	
3.18	OUTLET PROTECTION	(OP)	
3.19	RIPRAP	(RR)	

Figure 10 shows typical cross-sections of rock-check dams. The top two diagrams are 'DOWNSTREAM VIEW' cross-sections, showing a dam with a filter cloth (optional) and a height of 3'. The bottom two diagrams are 'UPSTREAM VIEW' cross-sections, showing a dam with coarse aggregate, a filter cloth, and a height of 3'. The bottom right diagram also shows a 'CLASS I REPAIR' area. A legend at the bottom indicates 'CD' for Rock-Check Dam.

This method of inlet protection is applicable at curb inlets where paving in front of the structure is not likely to cause inconvenience or damage to adjacent structures and unprotected areas.

* Gravel shall be VDOT #3, #37 or 5 coarse aggregate.

Diagram illustrating a curb inlet with inlet protection. The structure includes a concrete gutter, sediment, and a curb inlet. A dimension of 12' is indicated. A legend at the bottom identifies the components: (P) GRAVEL, CURB INLET, SEDIMENT FILTER.

Diagram illustrating an excavated drop inlet sediment trap. The structure is shown in cross-section, featuring a vertical drop inlet and a horizontal settling chamber. Key components and labels include:

- MAX. SLOPE 2:1**: Indicated on the side slope of the inlet.
- WEED HOLES FOR DEWATERING**: Located in the top cover of the settling chamber.
- LARGER PARTICLES WILL SETTLE**: Points to the bottom of the settling chamber.
- STORM WATER WITH LARGER PARTICLES REMOVED**: Points to the water flowing out of the bottom of the settling chamber.
- DRAIN INLET**: The vertical pipe through which storm water enters the trap.

The diagram shows water entering from the top left, passing through a drop, and then settling in the horizontal chamber before exiting through a drain inlet at the bottom right.

3.20	ROCK CHECK DAMS	CD	
3.21	LEVEL SPREADER	LS	
3.22	VEGETATIVE STREAMBANK STABILIZATION	VSS	
3.23	STRUCTURAL STREAMBANK STABILIZATION	SSS	
3.24	TEMPORARY VEHICULAR STREAM CROSSING	VSC	
3.25	UTILITY STREAM CROSSING	USC	
3.26	DEWATERING STRUCTURE	DS	
3.27	TURBIDITY CURTAIN	TC	
3.28	SUBSURFACE DRAIN	SD	
3.29	SURFACE ROUGHENING	SR	
3.30	TOPSOILING	TO	
3.31	TEMPORARY SEEDING	TS	
3.32	PERMANENT SEEDING	PS	
3.33	SODDING	SO	
3.34	BERMUDA GRASS AND ZOYSIAURASS ESTABLISHMENT	BZ	
3.35	MULCHING	MU	
3.36	SOIL STABILIZATION BLANKETS AND MATTING	SE	
3.37	TREES, SHRUBS, VINES AND GROUND COVERS	VEG	
3.38	TREE PRESERVATION AND PROTECTION	TP	
3.39	DUST CONTROL	DC	

[illegible]

Diagram illustrating the construction of a temporary gravel construction entrance, showing a cross-section and a plan view.

Cross-section details:

- Top layer: 10" MIN. (Gravel/Aggregate)
- Layer below: 12" MIN. (Gravel/Aggregate)
- Bottom layer: VDOT #1 Coarse Aggregate
- Structure: Filter Cloth
- Support: Ref. Table 3.02-A of Virginia ESC Handbook for requirements.

Plan view details:

- Width: 12" MIN.
- Depth: 3' MIN.
- Material: FILTER CLOTH

Wash Rack Detail (if required):

- Structure: Reinforced Concrete
- Drain Space

CE TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

ALL COSTS GIVEN ARE COMPLETE IN PLACE				
DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CONSTRUCTION ENTRANCE	EA	2	\$500	\$1400
SILT FENCE	LF	630	\$1300	\$1890
INLET PROTECTION	EA			
TEMPORARY DIVERSION DIKE	LF			
TEMPORARY FILL DIVERSION	LF			
SEDIMENT TRAP	EA			
CHECK DAM	EA			
PERMANENT SEEDING	1000 SF	15	\$35000 SF	\$525
OUTLET PROTECTION	EA			
SEDIMENT BASIN	EA			
SUB-TOTAL				\$3815
10% CONTINGENCY				\$382
TOTAL PROJECT COST				\$4197

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 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 PRACTICABLE.
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, SEDIMENTATION, 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 UNIFORM CODING SYSTEM FOR EROSION AND SEDIMENT CONTROL PRACTICES CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. THESE SYMBOLS SHALL BE USED TO BE UTILIZED IN ALL EROSION CONTROL PLANS SUBMITTED TO ROADNOKE COUNTY.

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

LIME: 140 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE

FERTILIZER: 5-20-0 @ 25 LB / 1000 SF
30-0-0 @ 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 WEEDING 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 FIRM, FRAGILE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

TOTAL DISTURBED AREA = 0.34 AC. = 15,000 SQ. FT.

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

DATE: 11/02/93
SCALE: NO SCALE
DRAWING BY: CLN,AF
DESIGNED BY: G:\CAD\DETAILS\EROSION\EROSION)
APPROVED BY: GWS,III

SHEET
6
OF
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RC 7800