

ALL COSTS GIVEN ARE COMPLETE IN PLACE				
DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
18" FLARED END SECTION	LUMP	1	\$ 400	\$ 400
60" ASP	LF	114	90	10,260
48" ASP	LF	47	75	3525
18" CP	LF	34	28	952
STRUCTURES	LUMP	2	3500	7000
ACCESS ROAD				
AS-BUILTS			1000	1000
SUB-TOTAL				\$ 23,137
10% CONTINGENCY				\$ 2313
TOTAL PROJECT COST				\$ 25,450

DESIGN HIGH WATER (OVER STAGE 10.0)

MIN. 10"

CREST OF EMERGENCY SPILLWAY

0.5'

MIN. 10"

67 CY/AC "DRY" STORAGE

67 CY/AC "WET" STORAGE

SEEDING CLEANOUT POINT ("WET" STORAGE REDUCED TO 34 CY/AC)

DEWATERING SERVICE

DESIGN ELEVATIONS WITH EMERGENCY SPILLWAY

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.

(IP) GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

1. 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 OF VIRGINIA.

2. 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, IS THE INTERIOR SLOPE FLAT, OR IS 3 (3) (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.

1. SITE PREPARATION SHALL BE IN ACCORDANCE WITH THE COUNTY OF
ROANOKE 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 (20 CM) LOOSE LIFTS. EACH LIFT SHALL BE SPREAD IN UNIFORM LAYERS. FILL SOIL SHALL BE UTILIZED ONLY WITHIN A MOISTURE RANGE OF $\pm 5\%$ 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 ROMANOKE 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.

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 SEED.

10. THE MINIMUM SLOPE OF THE BASIN FLOOR SHALL BE ONE (1) PERCENT GRADED TO DRAIN TO THE PRINCIPAL SPILLWAY.

ACRES OR LESS OF DRAINAGE AREA

2-10 ACRES OF DRAINAGE AREA

DOWNSTREAM VIEW

DOWNSTREAM VIEW

FILTER CLOTH (OPTIONAL)

FILTER CLOTH (OPTIONAL)

ROOT #1

ROOT #1

COARSE AGGREGATE

COARSE AGGREGATE

GLASS #1 RIPRAP

CD

ROCK CHECK DAM

The diagram illustrates a curb inlet system for stormwater management. It shows a cross-section of the inlet where runoff water enters from the left. A gravel filter, 12 inches thick, is placed over the sediment gutter. Below the gravel is a wire mesh, also 12 inches thick, which allows water to pass while trapping debris. The filtered water then flows into the curb inlet. A specific application note states that this method is suitable for use at curb inlets where ponding is not likely to cause inconvenience or damage to adjacent structures and unprotected areas. A note specifies that the gravel should be VDOT #3, #57 or 5 coarse aggregate.

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.

SEDIMENT-LADEN RUNOFF

AS REQUIRED

DEPTH BELOW TOP OF INLET MIN. 1'-MAX. 2'

MAX. SLOPE 2:1

STORM WATER WITH LARGER PARTICLES REMOVED

DRAIN INLET

V-CURB GRATE FOR REMOVAL

LARGER PARTICLES WILL SETTLE

The diagram illustrates the construction of a silt fence using SF (Silt Fence Fabric). The top part is a cross-section showing a trench filled with filter fabric, with a wire mesh on top and a post. Dimensions include 4.0' for the trench depth and 5.0' for the trench width. Labels include 'Wire', 'Filter Fabric', 'Post', and 'Extend Fabric and Wire into Trench'. The bottom part is a plan view showing the flow direction and the placement of the silt fence fabric and wire mesh. A legend indicates: 10' IF WIRE USED, 6' IF WIRE NOT USED.

CROSS-SECTION

PLAN VIEW

LEGEND

- 10' IF WIRE USED
- 6' IF WIRE NOT USED

SF CONSTRUCTION OF A SILT FENCE

30d

Plan

Section A-A

Pipe Outlet To Flat Area With No Defined Channel

Plan

Section A-A

Pipe Outlet To Valley

NOTES

1. Apron lining may be rip-rap, grouted rip-rap, or concrete.
2. L_a is the length of the rip-rap apron as calculated using plates 136d and 136e.
3. $d = 1.5$ times the maximum stone diameter, but not less than 6'.

COUNTY OF ROANOKE DETAILS

[illegible]

ALL COSTS GIVEN ARE COMPLETE IN PLACE				
DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CONSTRUCTION ENTRANCE	EA	1	\$ 500	\$ 500
SILT FENCE	LF	310	3.00	930
INLET PROTECTION	EA	3	150	450
TEMPORARY DIVERSION DIKE	LF			
TEMPORARY FILL DIVERSION	LF			
SEDIMENT TRAP	EA			
CHECK DAM	EA			
PERMANENT SEEDING	1000 SF	14.32	40	572.80
OUTLET PROTECTION	EA	1	150	150
SEDIMENT BASIN	EA			
SUB-TOTAL				\$ 2602.80
10% CONTINGENCY				\$ 260.28
TOTAL PROJECT COST				\$ 2863.08

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 APPROVED AUTHORITY MAY ADD, DELETE, RELOCATE, CHANGE OR DISSEMINATE ANY 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 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, 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 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 THE AGENCY FOR REVIEW.
7. THE LOCATION OF ALL OFF-SITE FILL OR BORROW AREAS ASSOCIATED WITH THE CONSTRUCTION PROJECT WILL BE PROVIDED TO RANGEKNOE COUNTY DEPARTMENT OF DEVELOPMENT FOR REVIEW. EROSION SEDIMENT CONTROL PLAN OR MEASURES MAY BE REQUIRED FOR THIS AREA.

TYPE A	TYPE B (CLONES 34 OR STEEPER)
15 OCTOBER TO 1 FEBRUARY K-31 FESQUE # 5 L/2 L / 1000 SF BOSZE WINTER RYE # 1/2 L / 1000 SF	15 MARCH TO 31 MAY CROWN VETCH # 1/2 L / 1000 SF PERENNIAL RYEGRASS # 1/2 L / 1000 SF RED TOP # 1/2 L / 1000 SF
1 FEBRUARY TO 1 JUNE K-51 FESQUE # 5 L/2 L / 1000 SF ANNUAL RYE # 1/2 L / 1000 SF	15 AUGUST TO 1 OCTOBER CROWN VETCH # 1/2 L / 1000 SF PERENNIAL RYEGRASS # 1/2 L / 1000 SF RED TOP # 1/2 L / 1000 SF
1 JUNE TO 1 SEPTEMBER K-31 FESQUE # 5 L/2 L / 1000 SF GERMAN MILLET # 1/2 L / 1000 SF	
1 SEPTEMBER TO 15 OCTOBER K-31 FESQUE # 5 L/2 L / 1000 SF ANNUAL RYE # 1/2 L / 1000 SF	
LIME: 140 L / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE	
FERTILIZER: 5-20-10 @ 25 L / 1000 SF 30-0-0 @ 7.7 L / 1000 SF	
M-04: IF REQUIRED, SHALL BE USED OVER ALL SEEDED 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 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, OR TRACKED SEEDER, OR HYDROSEEDER ON A FIRM, FRABLE, SLOPE. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.	

TOTAL DISTURBED AREA = 0.799 AC. = 34,833.98 SQ. FT.

GENERAL NOTES

10 CHURCH AVE SE, PLAZA SUITE 1 ROANOKE, VIRGINIA 24011 540.342.6001
ROANOKE • MARION

SITE IMPROVEMENTS

SPECTRUM DESIGN PROJECT NO. 04051

DATE	7 JUNE, 2005	
DESIGN ARCHITECT		
PROJECT ARCHITECT		
PROJECT ENGINEER	MAR	
CHECKED BY		
DRAWN BY	MF	
REVISIONS	NUMBER	DATE

C-5.1