STORMWATER MANAGEMENT COST ESTIMATE ALL COSTS GIVEN ARE COMPLETE IN PLACE QUANTITY UNIT COST | TOTAL COST DESCRIPTION LS CLEARING & GRUBBING CY EXCAVATION CY **EMBANKMENT** FENCING STRUCTURES ACCESS ROAD AS-BUILTS SUB-TOTAL 10% CONTINGENCY TOTAL PROJECT COST

SEDIMENT BASIN SCHEMATIC

ELEVATIONS

DESIGN ELEVATIONS WITH

EMERGENCY SPILLWAY

DESIGN HIGH WATER
(25-YR. STORM ELEV.) MIN. 2.0

MIN. 1.0'

DESIGN ELEVATIONS WITHOUT

EMERGENCY SPILLWAY

(RISER PASSES 25-YR. EVENT)

DESIGN HIGH WATER (25-YR. STORM ELEV.)

67 C.Y./AC. -

67 C.Y./AC. --

SEDIMENT CLEANOUT POINT ("WET" STORAGE REDUCED

"WET" STORAGE

SEDIMENT CLEANOUT POINT

GENERAL NOTES

- 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.
- 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, 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.
- 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.
- 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.

CONSTRUCTION NOTES

- CREST OF EMERGENCY

- 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
 3. 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 +/- 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 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.
- 8. 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.
- 10. THE MINIMUM SLOPE OF THE BASIN *FLOOR SHALL BE ONE (1) PERCENT GRADED TO DRAIN TO THE PRINCIPAL SPILLWAY.

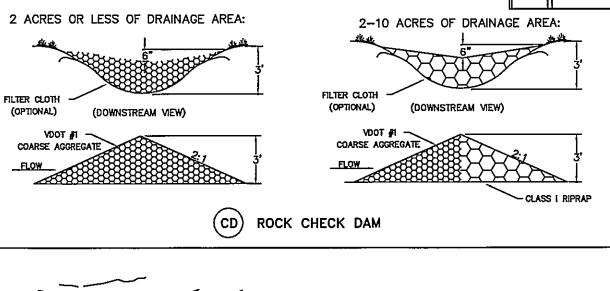
SPECIFIC APPLICATION

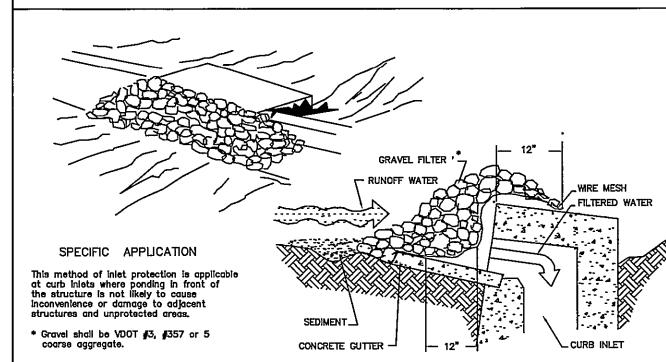
This method of inlet protection is applicable

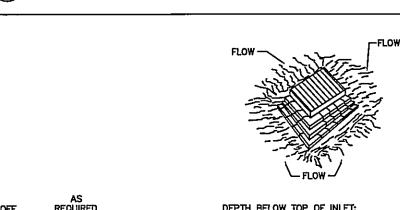
an overflow capability and ease of maintenance

where heavy flows are expected and where

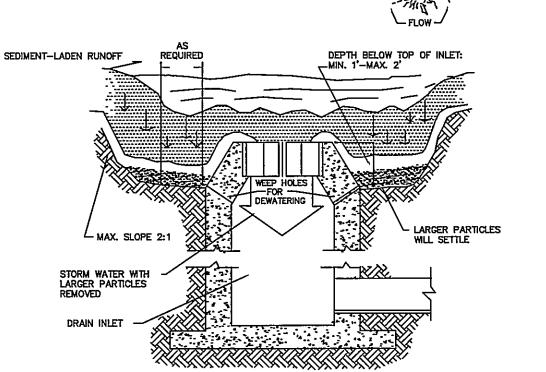
SYMBOL TITLE SYMBOL TITLE 3.01 SAFETY FENCE ROCK CHECK DAMS TEMPORARY GRAVEL -LEVEL SPREADER CONSTRUCTION ENTRANCE CONSTRUCTION ROAD VEGETATIVE STREAMBANK STABILIZATION STABILIZATION STRUCTURAL STREAMBANK STRAW BALE BARRIER STABILIZATION TEMPORARY VEHICULAR 3.05 SILT FENCE -x -x -x -x STREAM CROSSING UTILITY STREAM CROSSING 3.06 BRUSH BARRIER (2000) STORM DRAIN DEWATERING STRUCTURE 3.07 INLET PROTECTION CULVERT INLET PROTECTION TURBIDITY CURTAIN SUBSURFACE DRAIN TEMPORARY DIVERSION DIKE -----(SR)-----SURFACE ROUGHENING TEMPORARY FILL DIVERSION TEMPORARY RIGHT-OF-WAY ----(10)--- TOPSOILING DIVERSION ----(E) TEMPORARY SEEDING DIVERSION -}--- TEMPORARY SEDIMENT TRAP PERMANENT SEEDING <u>·≥ ~ ≠</u> ----® TEMPORARY SEDIMENT BASIN SODDING 3.14 BERMUDA GRASS AND TEMPORARY SLOPE DRAIN OYSIAURASS ESTABLISHMENT PAVED FLUME MULCHING 3.16 STORMWATER CONVEYANCE SOIL STABILIZATION TREAT, 1 TREAT, CHANNEL BLANKETS AND MATTING TREES, SHRUBS, VINES OUTLET PROTECTION AND GROUND COVERS TREE PRESERVATION RIPRAP AND PROTECTION DUST CONTROL

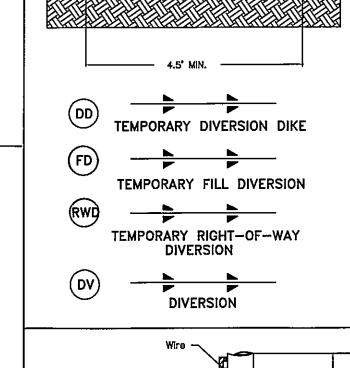






GRAVEL CURB INLET SEDIMENT FILTER





GENERAL EROSION AND SEDIMENT CONTROL NOTES

ES-1: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS VR 625-02-00 EROSION AND SEDIMENT CONTROL REGULATIONS

ES-2: THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE- CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.

THE FINAL INSPECTION.

ES-3: ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED

PRIOR TO OR AS THE FIRST STEP IN CLEARING.

ES-4: A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN

SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.

ES-5: PRIOR TO ISSUANCE OF A LAND DISTURBANCE PERMIT BY ROANOKE COUNTY, THE OWNER SHALL PROVIDE DOCUMENTATION OF AN EXISTING LAND DISTURBING PERMIT(S) THAT WOULD BE ASSOCIATED OR REQUIRED FOR ANY OFF-SITE BORROW OR WASTE AREAS; WHETHER LOCATED WITHIN THE COUNTY LIMITS OR NOT.

ES-6: THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.

ES-7: ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.

ES-8: DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN

ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF

THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

APPROVED FILTERING DEVICE.

ES-9: THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUN-OFF PRODUCING RAINFALL EVENT.

BAL-1: ALL ASPHALT AREAS WILL BE STABILIZED WITH BASE STONE WITHIN 30 DAYS OF FINAL GRADING.

BAL-2: PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE, BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

BAL—3: THE LOCAL APPROVING AUTHORITY AND OTHER INTERESTED AGENCIES SHALL MAKE A CONTINUING REVIEW AND EVALUATION OF THE METHODS USED FOR THE OVERALL EFFECTIVENESS OF THE EROSION CONTROL PROGRAM. AN APPROVED EROSION AND SEDIMENT CONTROL PLAN MAY BE AMMENDED BY THE APPROVING AUTHORITY OF ON SITE INSPECTION INDICATED THAT THE APPROVED CONTROL MEASURES ARE NOT EFFECTIVE IN CONTROLLING EROSION AND SEDIMENTATION OR IF BECAUSE OF CHANGED CIRCUMSTANCES, THE APPROVED PLAN CANNOT BE CARRIED OUT.

BAL-4: ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARDS, SPECIFICATIONS AND DETAILS OF THE LATEST EDITION OF THE VIRGINIA EROSION CONTROL HANDBOOK (THE HANDBOOK) BY THE VIRGINIA SOIL AND WATER CONSERVATION COMMISSION. EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE MAINTAINED SO THAT SEDIMENT CARRYING RUNOFF FROM THE SITE WILL NOT ENTER STORM DRAINAGE FACILITIES OR ADJOINING PROPERTIES AND RIGHTS-OF-WAY.

BAL-5: ALL CONSTRUCTION TRAFFIC SHALL ENTER AND EXIT THE SITE VIA THE CONSTRUCTION ENTRANCES.

EROSION-SILTATION CONTROL COST ESTIMATE

ITEM	QUANTITY	UNIT COST	TOTAL
	LF	\$3.00 per LF	
CONSTRUCTION ENTRANCE	EA	\$1,200.00 per EA	
SILT FENCE	1275 LF	\$3.00 per LF	\$3,825.00
DIVERSION	520 LF	\$3.00 per LF	\$1,560.00
INLET PROTECTION	7 EA	\$150.00 per EA	\$1,050.00
SEDIMENT TRAP	EA	\$1500.00 per CY	
RIP-RAP	Lump Sum		\$250.00
CHECK DAM	1 EA	\$250.00 per EA	\$250.00
TEMPORARY SLOPE DRAIN	35 LF	\$36.00 per LF	\$1,260.00
TEMPORARY SEEDING	3.7 AC	\$500.00 per AC	\$1,850.00
PERMANENT SEEDING	3.7 AC	\$1,000.00 per AC	\$3,700.00
MULCHING	3.7 AC	\$250.00 per CY	\$1,100.00
SOIL STABILIZATION MATTING	6,570 SY	\$1.50 per SY	\$925.00
DUST CONTROL	Lump Sum		\$500.00
CONSTRUCTION ROAD STABILIZATION	6,000 S.Y.	\$1.50 per SY	\$9,000.00
		SUB-TOTAL	\$25,270.00
		10% CONTINGENCY	\$2,530.00

THIS ESTIMATE IS FOR BONDING PURPOSES ONLY. ACTUAL QUANTITIES AND COSTS MAY VARY, BASED ON ACTUAL FIELD CONDITIONS AND CURRENT ECONOMIC CONDITIONS.

ESTIMATED TOTAL = \$27,800.00

Filter Fabric Ad Flabric and Into Trench CROSS—SECTION 10' IF WIRE IS USED. 6' IF WIRE IS NOT USED. SF CONSTRUCTION OF A SILT FENCE * MUST EXTEND FULL WIDTH OF INGRESS & EGRESS OPERATION.

Section A-A

1. Apron lining may be rip-rap,

grouted rip—rap, or concrete
2. La is the length of the rip—

plates 1.36d and 1.36e.

 d = 1.5 times the maximum stone diameter, but not less than 6".

rap apron as calculated using

<u>Pipe Outlet To Flat Area</u> <u>With No Defined Channel</u>

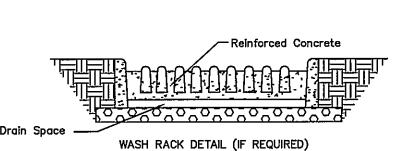
(OP) OUTLET PROTECTION

* MUST EXTEND FULL WIDTH OF INGRESS & EGRESS OPERATION.

12 MIN.

3" MIN.

FILTER CLOTH



CE TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

PS

PERMANENT SEEDING MIXTURE

15 MARCH TO 1 MAY

15 AUGUST TO 1 OCTOBER

TYPE B (SLOPES 3:1 OR STEEPER)

PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF

PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF

CROWN VETCH @ 1/2 LB / 1000 SF

CROWN VETCH @ 1/2 LB / 1000 SF

RED TOP @ 1/8 LB / 1000 SF

RED TOP @ 1/8 LB / 1000 SF

15 OCTOBER TO 1 FEBRUARY

K-31 FESCUE © 5 LB / 1000 SF

BORZY WINTER RYE © 1/2 LB / 1000 SF

1 FEBRUARY TO 1 JUNE

K-31 FESCUE © 5 LB / 1000 SF

ANNUAL RYE © 1/2 LB / 1000 SF

1 FEBRUARY TO 1 JUNE
K-31 FESCUE @ 5 LB / 1000 SF
ANNUAL RYE @ 1/2 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

ME: 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 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

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 = 3.9 AC. = 169,000 SQ. FT.

DEPARTMENT OF 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

to adjacent structures and unprotected areas.

* Grave! shall be VDOT #3, #357 or #5 coarse aggregate.

$\sqrt{1}$	PER 1ST REVIEW	01/23/06
2		
3		
4		
5		
6		
νо.	REVISIONS	DATE

COUNTY OF ROANOKE

EXCAVATED DROP INLET SEDIMENT TRAP

DATE: 11/02/93

SCALE: NO SCALE

DRAWING BY: CLN,AF (G:\CAD\DETAILS\EROS)

DESIGNED BY:

APPROVED BY: GWS,III

TILL OFFICE PARK

EROSION & SEDIMENT CONTROL
STORMWATER MANAGEMENT DETAILS

C-11