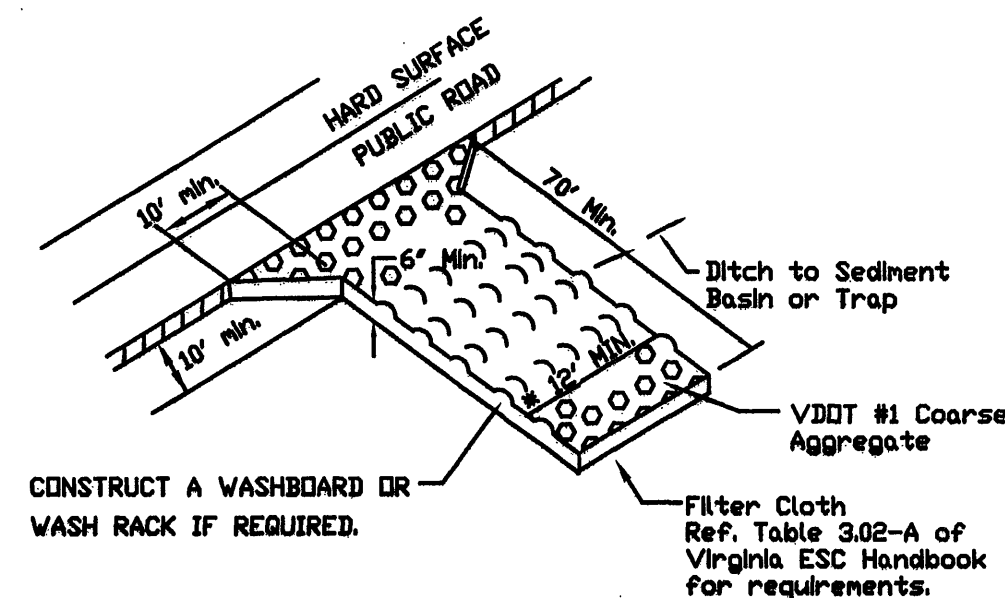
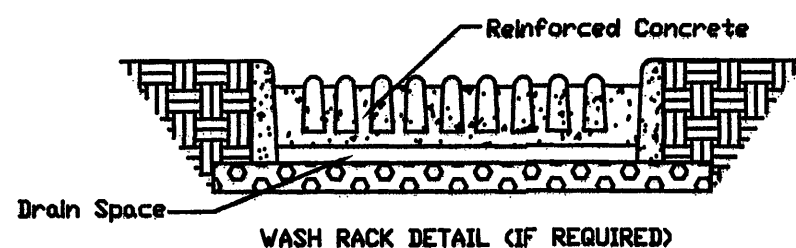
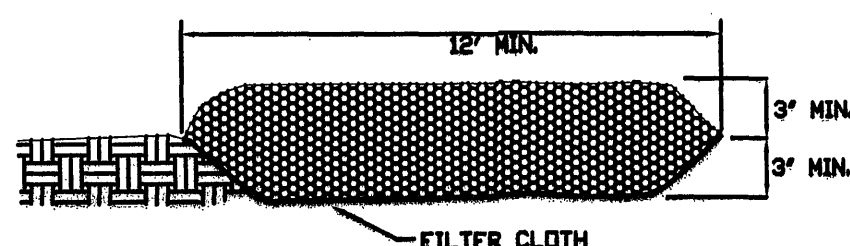


## STONE CONSTRUCTION ENTRANCE

CE



MUST EXTEND FULL WIDTH OF INGRESS & EGRESS OPERATION.



## PS PERMANENT SEEDING MIXTURE

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: 5-20-10 @ 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 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, CULTIPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

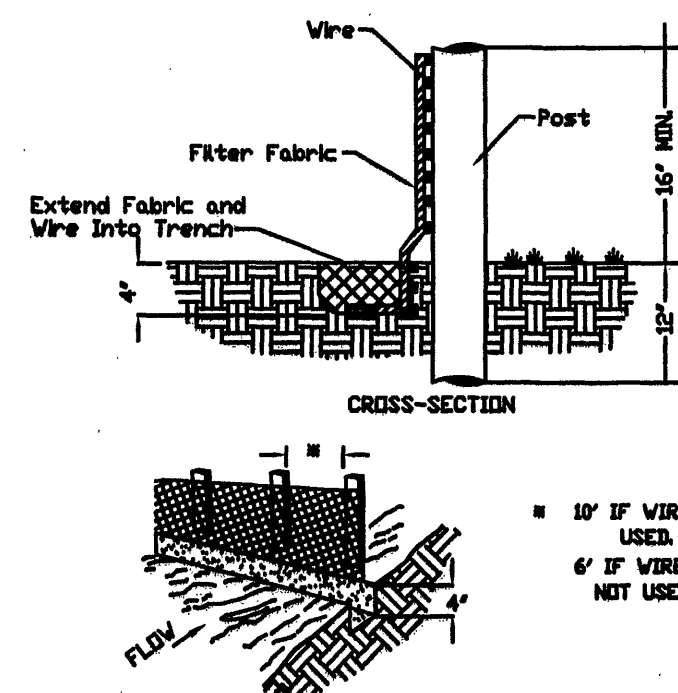
## TS TEMPORARY SEEDING MIXTURE

PLANTING DATES	SPECIES	RATE (LBS./ACRE)
SEPT. 1 - FEB. 15	50/50 MIX OF ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) & CEREAL (WINTER) RYE (SECALE CEREALE)	50 - 100
FEB. 16 - APR. 30	ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM)	60 - 100
MAY. 1 - AUG. 31	GERMAN MILLET (SETARIA ITALICA)	50

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.

## CONSTRUCTION OF A SILT FENCE

SF



## EROSION-SILTATION CONTROL COST ESTIMATE (JEFFERSON HILLS & HARTLAND RD.)

ALL COSTS GIVEN ARE COMPLETE IN PLACE

DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CONSTRUCTION ENTRANCE	EA	1	\$ 700.00	\$ 700.00
SILT FENCE	LF	715	3.00	2145.00
INLET PROTECTION	EA	0	100.00	0.00
PERMANENT SEEDING	1000 SF	21	30.00	630.00
SUB-TOTAL				3475.00
10% CONTINGENCY				348.00
TOTAL PROJECT COST				3823.00

NO.	TITLE	KEY	SYMBOL
3.02	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE	CE	— — —
3.05	SILT FENCE	SF	—x—x—x—x—
3.31	TEMPORARY SEEDING	TS	—○—○—○—○—
3.32	PERMANENT SEEDING	PS	—○—○—○—○—
3.35	MULCHING	MU	—○—○—○—○—

CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO THE FOLLOWING MINIMUM STANDARDS:

MS-1: THOUGH TS / PS LABELS ARE SHOWN GENERALLY ON THE PLANS, THE CONTRACTOR SHALL SEED ALL AREAS NOT INDICATED TO BE OTHERWISE STABILIZED WITH PERMANENT SEED MIXTURE WITHIN 7 DAYS OF REACHING FINAL GRADE OR WITH TEMPORARY SEED MIXTURE ANY AREA YET TO REACH FINAL GRADE BUT THAT IS NOT PROPOSED TO BE ACTIVELY INVOLVED IN THE WORK WITHIN 30 DAYS. THESE SEED MIXTURES AND APPLICATION SPECIFICATIONS ARE SHOWN HEREON. THE CONTRACTOR SHALL HONOR THE CLEARING AND GRADING LIMITS SHOWN ON THE PLAN.

MS-2: THE CONTRACTOR SHALL STABILIZE WITH TS AND PROTECT FROM EROSION, WITH ANY APPLICABLE METHOD, ALL STOCKPILES AND ANY ON-SITE OR OFF-SITE BORROW OR SPOIL AREAS, AS APPLICABLE. APPROVAL OF THIS PLAN DOES NOT COVER OFF-SITE BORROW OR SPOIL AREAS. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.

MS-3: WHERE TS/PS ARE NOT APPLICABLE PROVIDE OTHER MEANS OF STABILIZATION (ORS, ETC.) WITHIN 7 DAYS OF REACHING FINAL GRADE OR WITHIN 30 DAYS WHERE THE AREA IS YET TO REACH FINAL GRADE BUT IS NOT PROPOSED TO BE ACTIVELY INVOLVED IN THE WORK.

MS-4: ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLACED IN ADVANCE OF THE WORK THEY ARE INTENDED TO PROTECT.

MS-5: EARTHEN CONTROLS AND STRUCTURES SHALL BE STABILIZED IMMEDIATELY UPON INSTALLATION.

MS-6: WHERE A SEDIMENT TRAP (<3 ACRES OF DRAINAGE) OR SEDIMENT BASIN (>3 ACRES OF DRAINAGE) ARE INDICATED CALCULATIONS SHOWN ARE BASED ON OUTLINED DRAINAGE AREAS. CONTRACTOR SHALL HONOR INDICATED DRAINAGE DIVIDES AND CONFORM TO VOLUMES, DETAILS, ETC. PROVIDED ON PLANS.

MS-7: CARE HAS BEEN TAKEN IN DESIGN TO MINIMIZE DRAINAGE OVER SLOPES AND PROVIDE A SUITABLE PROTECTIVE STABILIZATION METHOD. CONTRACTOR SHALL PROTECT SLOPE AREAS DURING AND AFTER CONSTRUCTION FROM CONCENTRATED RUNOFF AND THE EROSION EFFECTS OF WIND AND RAIN. STABILIZE AS SOON AS PRACTICAL TO MINIMIZE EROSION.

MS-8: WHERE CONCENTRATED RUNOFF HAS BEEN ROUTED DOWN SLOPES CARE HAS BEEN TAKEN TO DESIGN AN ADEQUATE CHANNEL OR DRAIN. CONTRACTOR SHALL INSTALL THESE MEASURES ALONG WITH THEIR STABILIZATION AS SOON AS PRACTICAL TO PROTECT SLOPE. NOT APPLICABLE; NO CHANNELS OR DRAINS ARE PROPOSED OVER SLOPES.

MS-9: NOT APPLICABLE; SEEPAGE THROUGH SLOPES IS NOT ANTICIPATED TO BE ENCOUNTERED ON THIS PROJECT.

MS-10: INLET OR CULVERT INLET PROTECTION IS PROPOSED FOR THE INLETS OF ALL STORM SEWERS OR CULVERTS ON-SITE. RLD SHALL INSURE PROPER INSTALLATION AND ASSURE ADEQUATE SIZING BASED ON DRAINAGE AREA OF EACH INLET.

MS-11: RLD SHALL VERIFY THAT ADEQUATE CHANNEL LININGS AND PROPER OUTLET PROTECTION IS IN PLACE PRIOR TO OPERATION OF STORM SEWER SYSTEM.

MS-12: WHEN WORKING IN AND AROUND A LIVE WATERCOURSE, THE CONTRACTOR SHALL TAKE GREAT CARE TO MINIMIZE IMPACT ON THE STREAM. ASSURE THAT PROPER PERMITS FROM DEQ / USACE ARE IN HAND PRIOR TO COMMENCING SUCH WORK. NOT APPLICABLE - NO STREAM IMPACTS ARE PROPOSED WITH THIS DEVELOPMENT.

MS-13: WHERE MORE THAN 2 TRIPS IN 6 MONTHS ARE EXPECTED ACROSS A LIVE WATERCOURSE OBTAIN THE NECESSARY PERMIT AND INSTALL A TEMPORARY STREAM CROSSING. NOT APPLICABLE - NO JURISDICTIONAL STREAM CROSSINGS ARE PROPOSED WITH THIS DEVELOPMENT.

MS-14: OTHER FEDERAL, STATE, AND LOCAL REGULATIONS MUST BE MET WHEN WORKING IN LIVE WATERCOURSES. NOT APPLICABLE - NO WORK IS PROPOSED WITHIN JURISDICTIONAL WATERCOURSES.

MS-15: THE BED AND BANKS OF DISTURBED WATERCOURSES MUST BE STABILIZED IMMEDIATELY. NOT APPLICABLE - NO WORK IS PROPOSED WITHIN JURISDICTIONAL WATERCOURSES.

MS-16: REGARDING UTILITY INSTALLATIONS, NO MORE THAN 500 LF OF TRENCH MAY BE OPEN AT A GIVEN TIME. EXCAVATED MATERIAL SHALL BE PLACED ON UPHILL SIDE OF TRENCH. EFFLUENT OF ANY DEWATERING SYSTEM USED MUST BE FILTERED. TRENCHES SHALL BE PROPER BACKFILLED AND COMPACTED PER DETAIL AND SPECS. COMPLETED INSTALLATION SHALL BE RE-STABILIZED IMMEDIATELY.

MS-17: THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS OF CLEANING MUD FROM TRUCKS AND / OR OTHER EQUIPMENT PRIOR TO ENTERING PUBLIC STREETS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT THE STREETS ARE IN A CLEAN, MUD AND DUST FREE CONDITION AT ALL TIMES.

MS-18: SEEDDETAILS FOR CE, SF, AND TS/PS AT A MINIMUM.

MS-19: RESPONSIBLE LAND DISTURBER SHALL PAY PARTICULAR ATTENTION TO OFF-SITE AREAS CONTRIBUTING RUNOFF TO THE SITE. OFF-SITE LOCATIONS RECEIVING RUNOFF FROM THIS PROJECT, AND PROPER OPERATION OF STORMWATER MANAGEMENT PRACTICES ON-SITE. ALL DITCHES, SWALES, AND NATURAL WATERCOURSES DOWNSTREAM OF THIS PROJECT SHALL BE FIELD INSPECTED DURING AND AFTER CONSTRUCTION BY THE RLD TO ENSURE COMPLIANCE WITH DOR'S MS-19. IF EROSION OR SCOUR IS OCCURRING THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL CORRECTIVE MEASURES.

GENERAL EROSION AND SEDIMENT CONTROL NOTES, ROANOKE CITY, VIRGINIA

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 ONSITE PRECONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO 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 AND NARRATIVE, AS WELL AS A COPY OF THE LAND DISTURBING PERMIT, SHALL BE MAINTAINED ON THE SITE AT ALL TIMES. THE EROSION AND SEDIMENT CONTROL ADMINISTRATOR WILL DELIVER THESE MATERIALS AT THE ONSITE PRECONSTRUCTION CONFERENCE.

ES-5: PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.

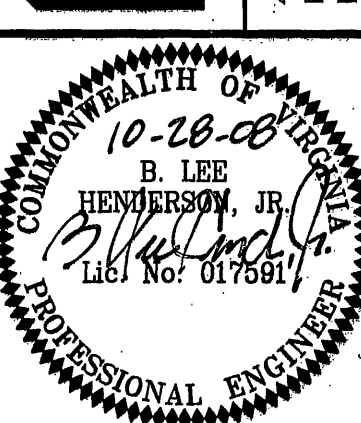
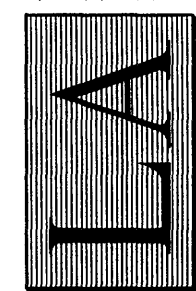
ES-6: THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.

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

ES-8: DURING DEWATERING OPERATION, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.

ES-9: THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY. AN INSPECTION REPORT MUST BE FILED WITH THE ROANOKE CITY EROSION AND SEDIMENT CONTROL ADMINISTRATOR ONCE EVERY TWO WEEKS, BEGINNING WITH COMMENCEMENT OF THE LAND DISTURBING ACTIVITY, AND WITHIN 48 HOURS OF ANY RUNOFF-PRODUCING RAINFALL EVENT. FAILURE TO SUBMIT A REPORT WILL BE GROUNDS FOR IMMEDIATE REVOCATION OF THE LAND DISTURBING PERMIT. REPORTS MUST BE POSTMARKED WITHIN 24 HOURS OF THE DEADLINE. A STANDARD INSPECTION REPORT FORM WILL BE SUPPLIED, WHICH SHOULD BE COPIED AS NECESSARY. THIS PROVISION IN NO WAY WAIVES THE RIGHT OF ROANOKE CITY PERSONNEL TO CONDUCT SITE INSPECTIONS, NOR DOES IT DENY THE RIGHT OF THE PERMITTEE (S) TO ACCOMPANY THE INSPECTOR (S).

LUMSDEN ASSOCIATES, P.C.  
ENGINEERS-SURVEYORS-PLANNERS  
ROANOKE, VIRGINIA



ESC DETAILS

LOWER MURRAY RUN  
SEWER IMPROVEMENTS  
PREPARED FOR  
WESTERN VIRGINIA WATER AUTHORITY  
ROANOKE, VIRGINIA

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		

DATE: October 28, 2008

SCALE: NONE

COMMISSION NO: 06-030

SHEET 5 OF 5