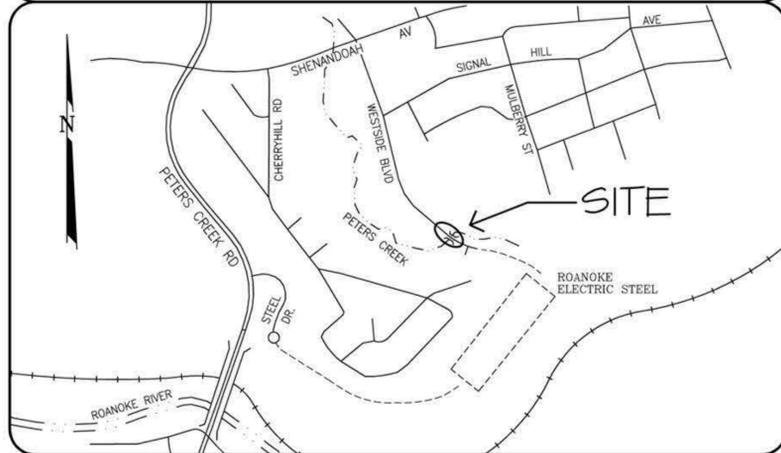


**PROJECT LOCATION MAP**



OFFICE OF THE CITY ENGINEER  
 215 CHURCH AVENUE, SW  
 ROOM 350  
 ROANOKE, VIRGINIA 24011-1587  
 PHONE: (540) 853-2731  
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 ENGINEER@ROANOKEVA.GOV

**INDEX OF SHEETS**

SHEET #	TITLE
1	COVER SHEET
2	PLAN & PROFILE
3	CONSTRUCTION DETAILS AND NOTES
4	VIRGINIA E.S.C. REGULATIONS
5	E.S.C. PLAN & DETAILS

**LEGEND**

**ABBREVIATIONS**

AHFH	ARROW HEAD TOP OF FIRE HYDRANT	LT	LEFT
APPROX	APPROXIMATE	MH	MANHOLE
ASPH	ASPHALT	MIN	MINIMUM
BC	BOTTOM OF CURB	PROP	PROPOSED
BIT	BITUMINOUS	PUE	PUBLIC UTILITY EASEMENT
BLDG	BUILDING	PVMT	PAVEMENT
BLK	BLOCK	R	RADIUS
BM	BENCHMARK	RT	RIGHT
BW	BOTTOM OF WALL	R/W	RIGHT OF WAY
C&G	CURB & GUTTER	REQD	REQUIRED
CMP	CORRUGATED METAL PIPE	SAN	SANITARY
CONC	CONCRETE	SD	STORM DRAIN
COR	CORNER	SDMH	STORM DRAIN MANHOLE
DI	DROP INLET	SS	SANITARY SEWER
DIA	DIAMETER	SSMH	SANITARY SEWER MANHOLE
EG	EDGE OF GRAVEL	STA	STATION
EP	EDGE OF PAVEMENT	STD	STANDARD
ELEC	ELECTRIC	TC	TOP OF CURB
ELEV	ELEVATION	TEL	TELEPHONE
ENTR	ENTRANCE	TW	TOP OF WALL
EW	ENDWALL	TYP	TYPICAL
EX	EXISTING	VESCH	VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK
FF	FINISHED FLOOR	VDOT	VIRGINIA DEPARTMENT OF TRANSPORTATION
FG	FINISH GRADE	VERT	VERTICAL
INV	INVERT	YD	YARD
HPT	HIGH POINT		
IP	IRON PIN		

**SYMBOLS**

EXISTING	NEW	
100.5	100.5	SPOT ELEVATION
----- 100 -----	---(100)---	CONTOURS
==== 8"SS ====	==== 8"SS ====	SANITARY SEWER LINE
==== 4"W ----	==== 4"W ----	WATERLINE
==== 8"SD ----	==== 8"SD ----	STORM DRAIN
---- 2"G ----	---- 2"G ----	GAS LINE
--- OHE ---	--- OHE ---	OVERHEAD ELECTRIC LINE
--- OHT ---	--- OHT ---	OVERHEAD TELEPHONE LINE
--- CATV ---	--- CATV ---	OVERHEAD CABLE TELEVISION LINE
--- UE --- UT ---	--- UE --- UT ---	UNDERGROUND TEL OR ELEC LINE
		WATER OR GAS METER
		VALVE
		FIRE HYDRANT
		MANHOLE
		CLEANOUT
		DROP INLET (CURB OR GRATE)
		UTILITY POLE, GUY & ANCHOR
		DITCH OR SWALE
		CENTERLINE OR BASELINE
		PROPERTY LINE
		SURVEY TRAVERSE POINT
		DIRECT ANGLE
		YARD LIGHTING
		YARD HYDRANT
		FENCE

**PROJECT NAME**

**TRANSPORTATION  
 STRUCTURE 8044  
 DRAINAGE IMPROVEMENTS**

CITY ENGINEERING PLAN NUMBER: 6799

REVISION BY	DESCRIPTION:	DATE

**APPROVED FOR CONSTRUCTION**

ROANOKE CITY ENGINEER

7-14-2015  
 DATE

DIRECTOR OF PUBLIC WORKS

07/14/15  
 DATE

ASSISTANT CITY MANAGER - OPERATIONS

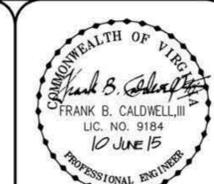
7/14/15  
 DATE

**CONSULTING ENGINEERS**

**CWA**  
**CALDWELL WHITE ASSOCIATES**  
 ENGINEERS / SURVEYORS / PLANNERS  
 4203 MELROSE AVENUE, N.W.  
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 ROANOKE, VIRGINIA 24017  
 (540) 366-3400  
 EMAIL: CWAROANOKE@AOL.COM

WORK ORDER NUMBER: 15-0025

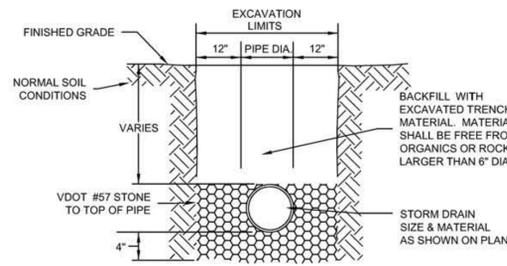
DATE: JUNE 10, 2015



SHEET NUMBER: 1 OF 5

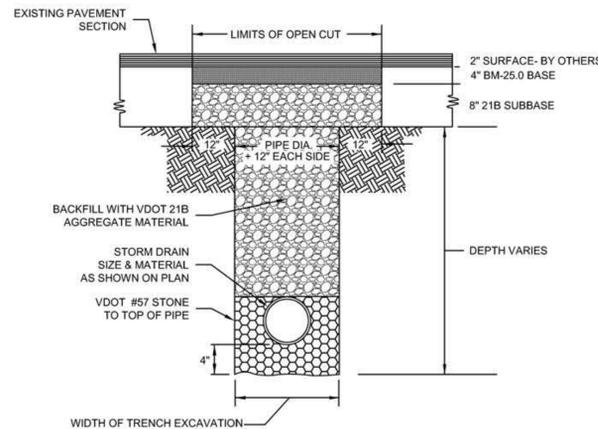


- NOTES:
1. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS: HAZARD RECOGNITION IN TRENCHING AND SHORING."
  2. WHEN EXCAVATED MATERIAL USED FOR BACKFILLING CONSISTS PREDOMINANTLY OF SOIL, EMBANKMENT SHALL BE PLACED IN SUCCESSIVE UNIFORM LAYERS NOT MORE THAN 8" IN THICKNESS BEFORE COMPACTION. EACH LAYER SHALL BE COMPACTED WITHIN A TOLERANCE OF 20% OF OPTIMUM MOISTURE CONTENT TO A DENSITY OF AT LEAST 95 PERCENT OF THE THEORETICAL MAXIMUM DENSITY.

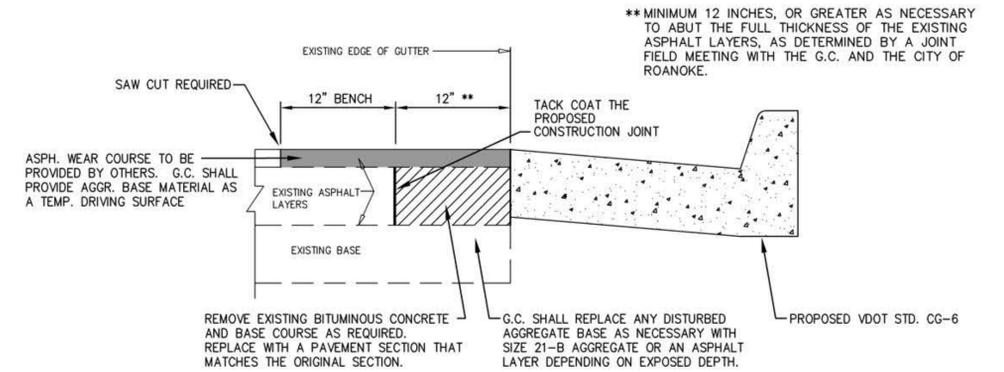


**BEDDING AND BACKFILL UNDER SOIL MATERIAL**

- NOTES:
1. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS: HAZARD RECOGNITION IN TRENCHING AND SHORING."
  2. BACKFILL SHALL BE INSTALLED IN 8" LOOSE LIFTS COMPACTED TO 95% MAX. DRY DENSITY AS DETERMINED BY ASTM D698, STANDARD PROCTOR.



**BEDDING AND BACKFILL UNDER PAVEMENT OR CURBING**



**PAVEMENT RESTORATION**

**RIPRAP INSTALLATION NOTES**

**GENERAL:**  
WORK SHALL PREFERABLY BE UNDERTAKEN DURING PERIODS OF DRY WEATHER AS THE WATER LEVEL OF PETERS CREEK IS GENERALLY LOWER AND IT ALSO ALLOWS FOR EASIER CONTROL OF SEDIMENT. IF THE WORK SCHEDULE REQUIRES WORKING IN THE RAIN, THE AREA OF WORK ALONG THE CREEK MUST BE ISOLATED AND APPROPRIATE SEDIMENT CONTROLS MUST BE INSTALLED TO PREVENT THE RELEASE OF SEDIMENT-LADEN RUNOFF.

G.C. SHALL SELECT APPROPRIATE EQUIPMENT AND WORK ACCESS ROUTES TO REDUCE DAMAGE TO ADJOINING VEGETATION AND WATERCOURSE BANKS. EQUIPMENT SHALL BE OPERATED FROM THE BANK OR ROAD SHOULDER, MACHINERY SHALL NOT CROSS OR OPERATE THROUGH THE WATER. ENSURE ALL EQUIPMENT USED ON THE SITE IS WELL MAINTAINED AND FREE OF FLUID LEAKS. REFUEL AND LUBRICATE EQUIPMENT ON DRY LAND AWAY FROM THE WATERCOURSE. USE DRIP TRAYS TO CONTAIN ANY SPILLAGE DURING EQUIPMENT MAINTENANCE.

**SUBGRADE PREPARATION:**  
THE SUBGRADE FOR THE RIPRAP OR FILTER SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY APPROXIMATING THAT OF THE SURROUNDING UNDISTURBED MATERIAL. IF PLACED ON FILL, FILL SHALL BE 95% COMPACTED AS DETERMINED BY STANDARD PROCTOR DENSITY. BRUSH, TREES, STUMPS AND OTHER OBJECTIONABLE MATERIAL (I.E., ORGANIC MATTER) SHALL BE REMOVED.

**FILTER BLANKET:**  
PLACEMENT OF THE FILTER BLANKET SHOULD BE DONE IMMEDIATELY AFTER SLOPE PREPARATION. FOR GRANULAR FILTERS THE STONE SHOULD BE SPREAD IN A UNIFORM LAYER TO THE SPECIFIED DEPTH. WHERE MORE THAN ONE LAYER OF FILTER MATERIAL IS USED, THE LAYERS SHOULD BE SPREAD SO THAT THERE IS MINIMAL MIXING OF LAYERS.

FOR GEOTEXTILE FILTER CLOTHS, THE CLOTH SHOULD BE PLACED DIRECTLY ON THE PREPARED SLOPE. THE EDGES OF THE SHEETS SHOULD OVERLAP BY AT LEAST 12 INCHES. ANCHOR ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS AND WITH THE PINS SUGGESTED BY THE MANUFACTURER. THE UPPER END OF THE CLOTH SHOULD BE BURIED A MINIMUM OF 12 INCHES DEEP. THE LOWER END SHOULD BE TOED IN. CARE SHOULD BE TAKEN NOT TO DAMAGE THE CLOTH WHEN PLACING THE RIPRAP. IF DAMAGE OCCURS, THAT SHEET SHOULD BE REMOVED AND REPLACED OR REPAIRED. FOR LARGE STONE, 12 INCHES OR GREATER, A 4-INCH LAYER OF GRAVEL SHALL BE USED TO PREVENT DAMAGE TO THE CLOTH, PROTECTION FROM ULTRAVIOLET RAYS AND TO PROVIDE INTERFACIAL CONTACT.

**STONE PLACEMENT:**  
THE PLACEMENT OF RIPRAP SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER. THE RIPRAP SHOULD BE PLACED SO THAT IT PRODUCES A DENSE WELL-GRADED MASS OF STONE WITH A MINIMUM OF VOIDS. THE DESIRED DISTRIBUTION OF STONES THROUGHOUT THE MASS MAY BE OBTAINED BY SELECTIVE LOADING AT THE QUARRY, CONTROLLED CLUMPING OF SUCCESSIVE LOADS DURING FINAL PLACING, OR BY COMBINATION OF THESE METHODS. THE RIPRAP SHOULD BE PLACED TO ITS FULL THICKNESS IN ONE OPERATION. THE RIPRAP SHOULD NOT BE PLACED IN LAYERS NOR DUMPED AS IT SEGREGATES THE VARIOUS STONE SIZES. CARE SHOULD BE TAKEN TO NOT DISLodge THE UNDERLYING MATERIAL WHEN PLACING THE STONES. THE FINISHED SLOPE SHOULD BE FREE OF POCKETS OF SMALL STONE OR CLUSTERS OF LARGE STONES. HAND PLACING MAY BE NECESSARY TO ACHIEVE THE REQUIRED GRADES AND A GOOD DISTRIBUTION OF STONE SIZES. FINAL THICKNESS OF THE RIPRAP BLANKET SHOULD BE WITHIN PLUS OR MINUS 1/4 OF THE SPECIFIED THICKNESS.

**GENERAL NOTES**

COORDINATION WITH OWNER:  
A) IT IS OF THE UTMOST IMPORTANCE THAT THE CONTRACTOR COORDINATE CLOSELY WITH THE CITY OF ROANOKE AND ROANOKE ELECTRIC STEEL RELATIVE TO PERMISSIBLE WORK HOURS AND DAYS.  
B) UNLESS OTHERWISE SCHEDULED WITH THE OWNER IN ADVANCE, BUSINESS OPERATIONS AT THE ADJOINING FACILITIES MUST PROCEED AS NORMAL, AND UNIMPEDED.  
C) CERTAIN HOURS OF THE DAY WILL BE MORE CONDUCTIVE FOR CERTAIN CONSTRUCTION ACTIVITIES. WORK CLOSELY WITH OWNER TO SCHEDULE ALL ASPECTS OF CONSTRUCTION.

THE CONTRACTOR SHALL, TO ALL EXTENTS PRACTICAL, MINIMIZE THE PERIOD OF TIME WHICH THERE WILL BE NO ACCESS WITHIN THE LIMITS OF WESTSIDE BOULEVARD.

ALL CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM TO THE CONSTRUCTION STANDARDS AND SPECIFICATIONS OF THE CITY OF ROANOKE, VDOT, AND/OR THE WESTERN VIRGINIA WATER AUTHORITY, AS APPLICABLE.

AN APPROVED SET OF PLANS AND ALL PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE.

CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AT THE JOB SITE.

NO CONSTRUCTION OR FIELD CHANGES WITHOUT PRIOR APPROVAL OF THE CONSULTING ENGINEER AND THE CITY OF ROANOKE DEPARTMENT OF PLANNING, BUILDING AND DEVELOPMENT.

LOCATION OF UNDERGROUND UTILITIES SHOWN ARE BASED ON FIELD SURVEYS, AS SHOWN BY AVAILABLE RECORDS AND AS LOCATED BY THE UTILITY LOCATOR SERVICE. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION.

THE SITE WORK AND LANDSCAPING CONTRACTOR(S) SHALL COMPLY WITH LOCAL CODES IN OBSERVING EROSION CONTROL MEASURES, BOTH ON AND OFF THE SITE. REFER TO THE VIRGINIA UNIFORM CODING SYSTEM CONTAINED IN THE VIRGINIA SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION, FOR DETAILS AND SPECIFICATIONS OF EROSION CONTROL ITEMS SHOWN ON THESE PLANS.

ALL PAVING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.

EXISTING CURBING, PAVEMENT, UTILITY LINES OR OTHER PHYSICAL FEATURES THAT REQUIRE DEMOLITION SHALL BE REMOVED FROM THE SITE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF ROANOKE. THE CONTRACTOR SHALL SAW-CUT ALL EXISTING FEATURES THAT ARE TO BE DEMOLISHED AND WHERE NEW CONSTRUCTION JOINS THE EXISTING.

CONSTRUCTION DEBRIS SHALL BE CONTAINED IN ACCORDANCE WITH THE VIRGINIA VIRGINIA LITTER CONTROL ACT. NO LESS THAN ONE LITTER RECEPTACLE SHALL BE PROVIDED ON-SITE.

**FINAL APPROVAL OF STORM DRAIN SYSTEMS**

THERE ARE IMPORTANT STEPS YOU CAN TAKE WITH RESPECT TO SITE WORK THAT WILL HELP AVOID DELAYS IN FINAL APPROVAL:

- BEFORE MAKING FIELD REVISIONS, SUBMIT AN AMENDMENT TO YOUR COMPREHENSIVE DEVELOPMENT PLAN FOR REVIEW AND APPROVAL.
- ENSURE STORM DRAIN SYSTEMS ARE INSPECTED DURING INSTALLATION AND THE CONTRACTOR PERFORMING THE WORK IS ON THE CONTRACTOR/SUBCONTRACTOR LIST FOR THE PROJECT.
- ALL STORM DRAIN STRUCTURES AND LINES MUST BE FULLY OPERATIVE AND FREE OF DEBRIS.

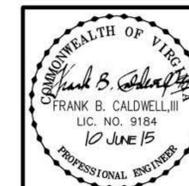
**STANDARD CITY OF ROANOKE CONSTRUCTION PROCEDURE REQUIREMENTS**

NOTICE: ALL LANDOWNERS, DEVELOPERS AND CONTRACTORS

FAILURE TO COMPLY WITH THE CONSTRUCTION PROCEDURE REQUIREMENTS LISTED BELOW MAY RESULT IN THE COSTLY REMOVAL OF STRUCTURES, TIME DELAYS OR THE ISSUANCE OF A STOP WORK ORDER.

**CONSTRUCTION PROCEDURE REQUIREMENTS**

1. RIGHT-OF-WAY EXCAVATION PERMIT -PRIOR TO THE COMMENCEMENT OF ANY DIGGING, ALTERATION OR CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY (STREETS, ALLEYS, PUBLIC EASEMENTS), A RIGHT-OF-WAY EXCAVATION PERMIT SHALL BE APPLIED FOR AND OBTAINED BY THE CONTRACTOR FROM THE CITY OF ROANOKE.
2. LAND DISTURBANCE PERMIT -AN APPROVED EROSION AND SEDIMENT CONTROL PLAN FOR ANY BORROW/FILL SITES ASSOCIATED WITH THE PROJECT MUST BE SUBMITTED PRIOR TO THE ISSUANCE OF A LAND DISTURBANCE PERMIT.
3. PLANS AND PERMITS -A COPY OF THE PLANS AS APPROVED BY THE CITY (SIGNED BY THE PROPER CITY OFFICIALS) AND ALL PERMITS ISSUED BY THE CITY SHALL BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES OF ONGOING CONSTRUCTION.
4. LOCATION OF UTILITIES -THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
5. CONSTRUCTION ENTRANCE -THE CONTRACTOR SHALL INSTALL AN ADEQUATE CONSTRUCTION ENTRANCE FOR ALL CONSTRUCTION RELATED EGRESS FROM THE SITE. SIZE AND COMPOSITION OF CONSTRUCTION ENTRANCE SHALL BE AS SHOWN ON THE PLANS.
6. STREETS TO REMAIN CLEAN -IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE THAT THE PUBLIC STREET ADJACENT TO THE CONSTRUCTION ENTRANCE REMAINS FREE OF MUD, DIRT, DUST, AND/OR ANY TYPE OF CONSTRUCTION MATERIALS OR LITTER AT ALL TIMES.
7. BARRICADES/DITCHES -THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF ALL EXCAVATED DITCHES AND SHALL FURNISH AND ENSURE THAT ALL BARRICADES PROPER AND NECESSARY FOR THE SAFETY OF THE PUBLIC ARE IN PLACE.
8. SEWER AND PAVEMENT REPLACEMENT -CONSTRUCTION OF SANITARY SEWERS AND THE REPLACEMENT OF PAVEMENT SHALL BE IN ACCORDANCE WITH APPROVED STANDARDS AND SPECIFICATIONS OF THE CITY OF ROANOKE AND THE WESTERN VIRGINIA WATER AUTHORITY.
9. APPROVED PLANS/CONSTRUCTION CHANGES -ANY CHANGE OR VARIATION FROM CONSTRUCTION DESIGN AS SHOWN ON THE OFFICIALLY APPROVED PLANS SHALL BE APPROVED BY THE EROSION AND SEDIMENT CONTROL AGENT PRIOR TO SAID CHANGES OR VARIATION IN CONSTRUCTION BEING MADE.
10. FINAL ACCEPTANCE/CITY -THE OWNER OR DEVELOPER SHALL FURNISH THE CITY OF ROANOKE'S PLANNING BUILDING AND DEVELOPMENT DEPARTMENT WITH A FIELD SURVEYED FINAL CORRECT SET OF AS-BUILT PLANS OF THE NEWLY CONSTRUCTED STORM DRAIN AND/OR STORMWATER MANAGEMENT FACILITIES PRIOR TO FINAL ACCEPTANCE AND ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE CITY. AS-BUILT PLANS SHALL BE PROVIDED IN THE STATE PLANE VIRGINIA SOUTH COORDINATE SYSTEM, NAD 1983, FIPS 4502 FEET, US SURVEY FEET, DATUM NAD 83, IN THE FORM OF 1-PAPER COPY AND 1-DIGITAL AUTOCAD FILE.



CONSTRUCTION DETAILS & NOTES  
**TRANSPORTATION STRUCTURE 8044**  
DRAINAGE IMPROVEMENTS  
SITUATE WESTSIDE BOULEVARD, NW  
ROANOKE CITY, VIRGINIA

Designed: J.V.J.  
Drawn: J.V.J.  
Checked: F.B.C.  
Date: 06/10/15  
Scale: AS NOTED  
Tax Parcel: 1040202  
N.B. No.: RKE CITY #11  
W.O. No.: 15-0025

**CWA**  
**CALDWELL WHITE ASSOCIATES**  
ENGINEERS / SURVEYORS / PLANNERS  
4203 MELROSE AVENUE, N.W.  
P.O. BOX 6280  
ROANOKE, VIRGINIA 24017  
(540) 366-3400  
EMAIL: CWAROANOKE@AOL.COM

STATE IMPOSED MINIMUM STANDARDS – 9VAC25–840–40

THE FOLLOWING STANDARDS ARE TO BE PROVIDED OR ADDRESSED ON EVERY DEVELOPMENT PROJECT EXCEEDING 2000 S.F. IN AREA OF DISTURBANCE. THESE STANDARDS ARE CONSIDERED A MINIMUM AND MAY REQUIRE ADDITIONAL MEASURES AS DEEMED NECESSARY BY THE LOCAL VIRGINIA EROSION & SEDIMENT CONTROL PROGRAM AUTHORITY OR THE CONSULTING ENGINEER.

CRITERIA, TECHNIQUE OR METHOD	REMARKS
1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD. TEMPORARY & PERMANENT SEEDING SPECIFICATIONS ARE PROVIDED ON SHEET 5.
2. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCK PILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS BORROW AREAS AND SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.	SOIL STOCKPILING IS NOT ANTICIPATED DUE TO THE NATURE OF THE PROJECT. EXCESS MATERIAL FROM TRENCHING AND RIPRAP EXCAVATION SHALL BE HAULED AWAY AS NEEDED.
3. A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
4. SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
5. STABILIZATION METHODS SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
6. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND CONSTRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN. A) THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES. B) SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A 25-YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED FOR RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.	NOT APPLICABLE – MAJORITY OF PROJECT IS LINEAR EXCAVATION
7. CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZATION MEASURES UNTIL THE PROBLEM IS CORRECTED.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
8. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.	THE NEW DISCHARGE POINT FOR THE CONCENTRATED RUNOFF IS INTO RIPRAP ADJOINING A LIVE WATERCOURSE.
9. WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.	NOT APPLICABLE – ALL CUT SLOPES WILL BE STABILIZED BY RIPRAP AND IS ADJACENT TO A LIVE WATERCOURSE.
10. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.	THE PROPOSED STORM PIPE WILL ONLY BE ACCEPTING RUN-OFF THAT IS CURRENTLY DEVELOPED.
11. BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.	THE EXISTING RECEIVING CHANNEL WILL BE PROTECTED WITH RIPRAP LINING.
12. WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NON-ERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NON-ERODIBLE COVER MATERIALS.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
13. WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NON-ERODIBLE MATERIAL SHALL BE PROVIDED.	NOT APPLICABLE. NO LIVE WATERCOURSES WILL BE CROSSED BY THE CONSTRUCTION VEHICLES.
14. ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
15. THE BEDS AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
16. UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA: A) NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME. B) EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES. C) EFFLUENT FROM DE-WATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY. D) MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION. E) RE-STABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THIS CHAPTER. F) APPLICABLE SAFETY REQUIREMENTS SHALL BE COMPLIED WITH.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
17. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND-DISTURBING ACTIVITIES.	SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
18. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE VESCP AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.	SELF-EXPLANATORY. PER REQUIREMENTS OF THE CITY OF ROANOKE IT SHALL BE NOTED THAT NO EROSION CONTROL STRUCTURAL MEASURES INDICATED ON THESE PLANS ARE TO BE REMOVED WITHOUT APPROVAL FROM THE CITY.
19. PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA. STREAM RESTORATION AND RELOCATION PROJECTS THAT INCORPORATE NATURAL CHANNEL DESIGN CONCEPTS ARE NOT MAN-MADE CHANNELS AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS. A) CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITE SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN-MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEM. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR PIPE SYSTEM, DOWNSTREAM STABILITY ANALYSES AT THE OUTFALL OF THE PIPE OR PIPE SYSTEM SHALL BE PERFORMED. B) ADEQUACY OF CHANNELS AND PIPES SHALL BE VERIFIED IN THE FOLLOWING MANNER: (1) THE APPLICANT SHALL DEMONSTRATE THAT THE TOTAL DRAINAGE AREA TO THE POINT OF ANALYSIS WITHIN THE CHANNEL IS ONE HUNDRED TIMES GREATER THAN THE CONTRIBUTING DRAINAGE AREA OF THE PROJECT IN QUESTION; OR (2) (a) NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS. (b) ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A TWO-YEAR STORM TO DEMONSTRATE THAT STORMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND (c) PIPES AND STORM SEWER SYSTEMS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM. C) IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL: (1) IMPROVE THE CHANNELS TO A CONDITION WHERE A TEN-YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO-YEAR STORM WILL NOT CAUSE EROSION TO THE CHANNEL BED OR BANKS; OR (2) IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE TEN-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES; OR (3) DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TWO-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A NATURAL CHANNEL OR WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TEN-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A MAN-MADE CHANNEL; OR (4) PROVIDE A COMBINATION OF CHANNEL IMPROVEMENT, STORMWATER DETENTION OR OTHER MEASURES WHICH IS SATISFACTORY TO THE VESCP AUTHORITY TO PREVENT DOWNSTREAM EROSION. D) THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS. E) ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT CONDITION OF THE SUBJECT PROJECT. F) IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION, HE SHALL OBTAIN APPROVAL FROM THE VESCP OF A PLAN FOR MAINTENANCE OF THE DETENTION FACILITIES. THE PLAN SHALL SET FORTH THE MAINTENANCE REQUIREMENTS OF THE FACILITY AND THE PERSON RESPONSIBLE FOR PERFORMING THE MAINTENANCE. G) OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATORS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL. H) ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE. I) INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY. J) IN APPLYING THESE STORMWATER MANAGEMENT CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITION SHALL BE USED IN ALL ENGINEERING CALCULATIONS. K) ALL MEASURES USED TO PROTECT PROPERTIES AND WATERWAYS SHALL BE EMPLOYED IN A MANNER WHICH MINIMIZES IMPACTS ON THE PHYSICAL, CHEMICAL AND BIOLOGICAL INTEGRITY OF RIVERS, STREAMS AND OTHER WATERS OF THE STATE. L) ANY PLAN APPROVED PRIOR TO JULY 1, 2014 THAT PROVIDES FOR STORMWATER MANAGEMENT THAT ADDRESSES ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS SHALL SATISFY THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS IF THE PRACTICES ARE DESIGNED TO (1) DETAIN THE WATER QUALITY VOLUME AND TO RELEASE IT OVER 48 HOURS; (2) DETAIN AND RELEASE OVER A 24-HOUR PERIOD THE EXPECTED RAINFALL RESULTING FROM THE ONE-YEAR, 24-HOUR STORM; AND (3) REDUCE THE ALLOWABLE PEAK FLOW RATE RESULTING FROM THE 1.5, 2 AND 10-YEAR, 24-HOUR STORMS TO A LEVEL THAT IS LESS THAN OR EQUAL TO THE PEAK FLOW RATE FROM THE SITE ASSUMING IT WAS IN A GOOD FORESTED CONDITION, ACHIEVED THROUGH MULTIPLICATION OF THE FORESTED PEAK FLOW RATE BY A REDUCTION FACTOR THAT IS EQUAL TO THE RUNOFF VOLUME FROM THE SITE WHEN IT WAS IN A GOOD FORESTED CONDITION DIVIDED BY THE RUNOFF VOLUME FROM THE SITE IN ITS PROPOSED CONDITION, AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS AS DEFINED IN ANY REGULATIONS PROMULGATED PURSUANT TO LOC #621-14-15.54 OR #621-44-15.65 OF THE ACT. M) FOR PLANS APPROVED ON AND AFTER JULY 1, 2014, THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF LOC #621-14-15.52 OF THE ACT AND THIS SUBSECTION SHALL BE SATISFIED BY COMPLIANCE WITH WATER QUALITY REQUIREMENTS IN THE STORMWATER MANAGEMENT ACT (LOC #621-14-15.24 ET SEQ. OF THE CODE OF VIRGINIA) AND ATTENDANT REGULATIONS, UNLESS SUCH LAND-DISTURBING ACTIVITIES ARE IN ACCORDANCE WITH 9VAC25-870-48 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATIONS. N) COMPLIANCE WITH THE WATER QUALITY MINIMUM STANDARDS SET OUT IN 9VAC25-870-66 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATIONS SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF SUBDIVISION 19 OF THIS SUBSECTION.	ENGINEERING CALCULATIONS, DATED 05/05/2015 HAVE BEEN SUBMITTED AND APPROVED BY THE VESCP AUTHORITY.  ..... ALL FORMS OF CONCENTRATED RUNOFF FLOW INTO AN ADEQUATE CHANNEL – PETERS CREEK.  ..... B-1 CRITERIA MET  ..... NOT APPLICABLE  ..... SUPPLEMENTAL EASEMENTS ARE TO BE ACQUIRED. ..... SEE REFERENCED ENGINEERING CALCULATIONS  ..... NOT APPLICABLE – NO INCREASE IN IMPERVIOUS AREA  ..... NOT APPLICABLE  ..... NEW PIPE SYSTEM DESIGNED PER APPLICABLE STDS. ..... NOT APPLICABLE  ..... SUBJECT PROJECT IS A MAINLY PUBLIC RIGHT-OF-WAY  ..... SELF-EXPLANATORY. THE BLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD. ..... NOT APPLICABLE  ..... NOT APPLICABLE – PROJECT IS LESS THAN 10,000 SF.  ..... ALL POINTS OF CONCENTRATED RUNOFF HAVE BEEN ANALYZED TO A POINT OF ADEQUACY BASED ON THE VSMP CRITERIA.

SOIL EROSION CONTROL NARRATIVE

LIMITS OF DISTURBANCE = 0.065 ACRES

PROJECT DESCRIPTION: THE PURPOSE OF THIS PROJECT IS TO IMPROVE THE DRAINAGE CHARACTERISTICS ALONG WESTSIDE BOULEVARD, NW IN THE VICINITY OF AN EXISTING CITY OF ROANOKE STRUCTURE #8044. THIS STRUCTURE IS A 4-CELL BOX CULVERT WITH STANDARD WINGWALLS AND A CONCRETE TRAVELING SURFACE. THE PROJECT CONSISTS OF ADDING INLETS AND PIPING TO THE WESTERN QUADRANT AND DISCHARGING THE RUNOFF BELOW THE DOWNSTREAM SIDE OF THE STRUCTURE #8044. SUPPLEMENTAL WORK IN THE AREA WILL CONSIST OF ADDING VDOT STD. EC-1, CLASS II RIPRAP ALONG THE WINGWALLS AND ERODED SLOPE AREAS TO HELP STABILIZE THE STRUCTURE PREVENT FURTHER SEDIMENT LOSS INTO PETERS CREEK.

EXISTING SITE CONDITIONS: THE MAJOR LIMITS OF DISTURBANCE WILL BE AT EACH OF THE FOUR WINGWALLS, WHERE IT WILL BE NECESSARY TO EXCAVATE APPROXIMATELY 3', ADD A FILTER FABRIC AND PLACE THE RIPRAP. THE INSTALLATION OF THE INLETS AND PIPEWORK IS MAINLY LOCATED WITHIN EXISTING IMPERVIOUS AREAS. THERE ARE A FEW TREES THAT WILL REQUIRE REMOVAL AND THE REMAINDER OF THE AREA IS CURRENTLY EITHER ERODED OR A WEED/BRUSH COVER. THE PROPOSED LIMITS OF WORKS LIE COMPLETELY WITHIN THE 100-YEAR FLOODWATERS OF PETERS CREEK.

ADJACENT PROPERTY: THE LIMITS OF DISTURBANCE IS LOCATED WITHIN THE PUBLIC RIGHT-OF-WAY OF WESTSIDE BOULEVARD, NW AND ON THE PRIVATE PROPERTIES OWNED BY EITHER ROANOKE ELECTRIC STEEL CORPORATION OR VIRGINIA HOUSING DEVELOPMENT AUTHORITY.  
A. THE WESTERN RIGHT-OF-WAY LINE IS BOUNDED BY PROPERTY OWNED BY VIRGINIA HOUSING DEVELOPMENT AUTHORITY AND IS CURRENTLY BEING USED A MULTI-RESIDENTIAL COMPLEX.  
B. THE NORTHERN RIGHT-OF-WAY LINE IS BOUNDED BY PROPERTY OWNED BY ROANOKE ELECTRIC STEEL CORPORATION, AND IS CURRENTLY UNDEVELOPED.  
C. THE EASTERN RIGHT-OF-WAY IS BOUNDED BY PROPERTY OWNED BY ROANOKE ELECTRIC STEEL CORPORATION, AND IS CURRENTLY AN ABANDONED GRAVEL PARKING AREA.  
D. THE SOUTHERN RIGHT-OF-WAY IS BOUNDED BY PROPERTY OWNED BY ROANOKE ELECTRIC STEEL CORPORATION, AND IS CURRENTLY UNDEVELOPED.

CRITICAL AREAS: THE CRITICAL AREAS FOR THIS PROJECT WILL BE THE INSTALLATION OF THE RIPRAP ADJOINING THE LIVE WATERCOURSE KNOWN AS PETERS CREEK. REFER TO SPECIAL NOTES ON SHEET C-3.

OFF-SITE AREAS: THE CONTRACTOR WILL BE REQUIRED TO PROVIDE, TO THE CITY OF ROANOKE:  
A. THE LOCATION OF ANY OFF-SITE BORROW AREAS  
B. THE LOCATION OF ANY OFF-SITE AREAS WHERE EXCESS EXCAVATED MATERIAL AND/OR TOPSOIL WILL BE DISPOSED.

SOILS: SOILS IN THIS AREA ARE IDENTIFIED BY THE "SOIL SURVEY OF ROANOKE COUNTY AND THE CITIES OF ROANOKE AND SALEM, AS 8A (Combs loam).  
MAP UNIT SETTING:  
National map unit symbol: kgjk  
Elevation: 750 to 2,600 feet  
Mean annual precipitation: 30 to 45 inches  
Mean annual air temperature: 50 to 57 degrees F  
Frost-free period: 171 to 207 days  
Farmland classification: All areas are prime farmland  
MAP UNIT COMPOSITION:  
Combs and similar soils: 75 percent  
Minor components: 5 percent  
Estimates are based on observations, descriptions, and transects of the mapunit.

DESCRIPTION OF COMBS:  
SETTING:  
Landform: Flood plains  
Landform position (three-dimensional): Tread  
Down-slope shape: Linear  
Across-slope shape: Linear  
Parent material: Alluvium  
TYPICAL PROFILE:  
H1 – 0 to 18 inches: loam  
H2 – 18 to 72 inches: loam  
PROPERTIES AND QUALITIES:  
Slope: 0 to 2 percent  
Depth to restrictive feature: More than 80 inches  
Natural drainage class: Well drained  
Runoff class: Very Low  
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)  
Depth to water table: More than 80 inches  
Frequency of flooding: Occasional  
Frequency of ponding: None  
Available water storage in profile: High (about 9.8 inches)  
INTERPRETIVE GROUPS:  
Land capability classification (irrigated): None specified  
Land capability classification (nonirrigated): 2w  
Hydrologic Soil Group: A

EROSION AND SEDIMENT CONTROL MEASURES: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK", LATEST EDITION. THE MINIMUM STANDARDS OF THE VESCP (SEE THIS SHEET) SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY VARIANCE BY THE VESCP. IN PARTICULAR THE FOLLOWING MEASURES ARE REFERENCED ON THE PLAN VIEW:  
SILT FENCE–Std. 3.05 ..... a temporary barrier constructed of posts, filter fabric and, in some case a wire support fence, placed across or at the toe of a slope to intercept and detain sediment.  
STRUCTURAL STREAMBANK STABILIZATION–Std. 3.23 ..... stabilizing the banks of live streams with permanent structural measures to protect them from erosion.

DEWATERING STRUCTURE–Std. 3.26 ..... a temporary settling and filtering device for water which is discharged from an excavated trench by means of pumping.  
TEMPORARY SEEDING–Std. 3.31 ..... establishment of temporary vegetative cover on disturbed areas that will not be brought to final grade with appropriate rapidly growing plants. Refer to the Minimum Standards, this Sheet.  
PERMANENT SEEDING–Std. 3.32 ..... establishment of perennial vegetative cover by planting seed on rough-graded areas that will not be brought to final grade for a year or more or where permanent, long-lived vegetative cover is needed on fine-graded areas.  
MULCHING–Std. 3.35 ..... application of plant residues or other suitable materials to the soil surface. Mulching will prevent erosion by protecting the soils surface from raindrop impact and reducing the velocity of overland flow. After seeding, mulching will foster the growth of vegetation by increasing available moisture and providing insulation against extreme heat and cold.  
TREE PRESERVATION & PROTECTION–Std. 3.38 ..... protection of desirable tree from mechanical and other injury during land disturbing and construction activity.

PERMANENT STABILIZATION: FOLLOWING FINAL GRADING OPERATIONS, ALL REMAINING DISTURBED AREAS LOCATED WITHIN THE LIMITS OF DISTURBANCE SHALL BE SEEDED AND STABILIZED WITHIN SEVEN (7) DAYS. SEEDING SHALL BE DONE ACCORDING TO THE STD. & SPEC. 3.32, PERMANENT SEEDING. IN ALL SEEDING OPERATIONS, SEED, AND ANY REQUIRED CHEMICALS SHALL BE APPLIED PRIOR TO MULCHING

MAINTENANCE: THE CONTRACTOR IS RESPONSIBLE FOR ADHERING TO ALL MAINTENANCE REQUIREMENTS OF THE EROSION AND SEDIMENT CONTROL MEASURES AS OUTLINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

STORMWATER RUNOFF CONSIDERATIONS: THERE ARE NO PROPOSED IMPERVIOUS AREAS INDICATED THAT WOULD INCREASE RUNOFF, PEAK OR QUANTITY. THERE ARE NO PROPOSED FORMS OF CONCENTRATED RUNOFF THAT WOULD CREATE FLOODING OR CHANNEL DEGRADATION DOWNSTREAM.

RESTORATION: PER REQUIREMENTS OF THE CITY OF ROANOKE IT SHALL BE NOTED THAT NO EROSION CONTROL STRUCTURAL MEASURES INDICATED ON THESE PLANS ARE TO BE REMOVED WITHOUT APPROVAL FROM THE CITY.  
MAINTENANCE: ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE VARIO REQUIREMENTS FOUND ON SHEET C-6 AND THOSE ASSOCIATED WITH THE SPECIFIC DETAIL FOUND ON SHEET C-8.

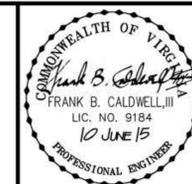
GENERAL COMMENTS:  
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES.  
2. NO WORK SHALL PROCEED ON SITE UNTIL THE PROPER AUTHORIZATION OR PERMIT HAS BEEN OBTAINED FROM THE CITY OF ROANOKE.  
3. PER REQUIREMENTS OF THE CITY OF ROANOKE IT SHALL BE NOTED THAT NO EROSION CONTROL STRUCTURAL MEASURES INDICATED ON THESE PLANS ARE TO BE REMOVED WITHOUT APPROVAL FROM THE CITY.

GENERAL EROSION & SEDIMENT CONTROL NOTES:

(AS TAKEN FROM TABLE 6-1 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK)

- 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 4VAC50-30 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.
- 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 COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THE 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 LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
- ES-8: DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
- ES-9: THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUN-OFF PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

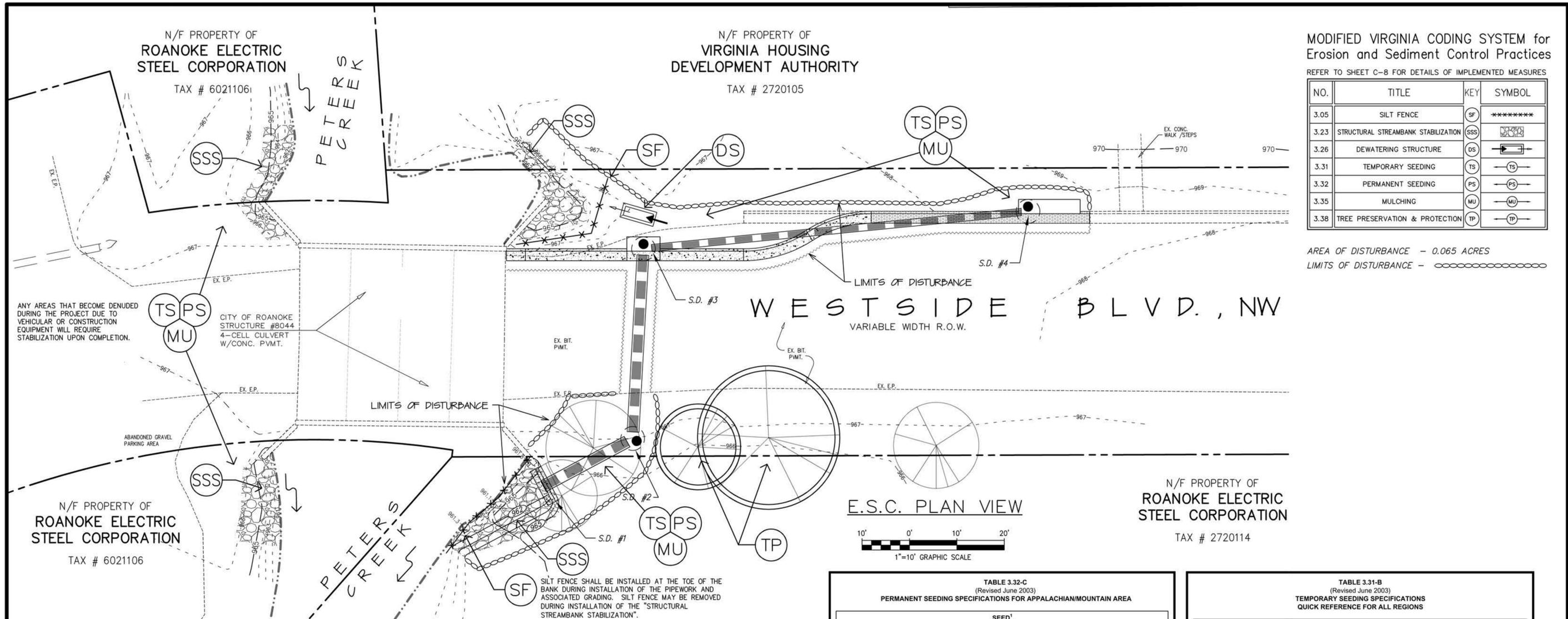
ACRONYMS	
BMP	BEST MANAGEMENT PRACTICE
COV	CODE OF VIRGINIA
DEQ	DEPARTMENT OF ENVIRONMENT QUALITY
EPA	ENVIRONMENTAL PROTECTION AGENCY
ESC	EROSION & SEDIMENT CONTROL
RLD	RESPONSIBLE LAND DISTURBER (REGISTERED W/DEQ)
SWM	STORMWATER MANAGEMENT
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
VAC	VIRGINIA ADMINISTRATIVE CODE
VESCP	VIRGINIA EROSION & SEDIMENT CONTROL PROGRAM
VPDES	VIRGINIA POLLUTION DISCHARGE ELIMINATION SYSTEM
VSMP	VIRGINIA STORMWATER MANAGEMENT PROGRAM



Designed: J.V.J.  
Drawn: J.V.J.  
Checked: F.B.C.  
Date: 06/10/15  
Scale: AS NOTED  
Tax Parcel: 1040202  
N.B. No.: RKE CITY #11  
W.O. No.: 15-0025

VIRGINIA E.S.C. REGULATIONS  
**TRANSPORATION  
STRUCTURE 8044**  
DRAINAGE IMPROVEMENTS  
SITUATE WESTSIDE BOULEVARD, NW  
ROANOKE CITY, VIRGINIA

**CWA**  
**CALDWELL WHITE ASSOCIATES**  
ENGINEERS / SURVEYORS / PLANNERS  
4203 MELROSE AVENUE, N.W.  
P.O. BOX 6280  
ROANOKE, VIRGINIA 24017  
(540) 366-3400  
EMAIL: CWAR@AOL.COM



**MODIFIED VIRGINIA CODING SYSTEM for Erosion and Sediment Control Practices**

REFER TO SHEET C-8 FOR DETAILS OF IMPLEMENTED MEASURES

NO.	TITLE	KEY	SYMBOL
3.05	SILT FENCE	SF	*****
3.23	STRUCTURAL STREAMBANK STABILIZATION	SSS	
3.26	DEWATERING STRUCTURE	DS	
3.31	TEMPORARY SEEDING	TS	
3.32	PERMANENT SEEDING	PS	
3.35	MULCHING	MU	
3.38	TREE PRESERVATION & PROTECTION	TP	

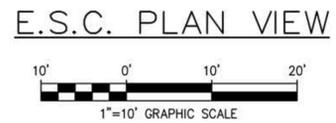
AREA OF DISTURBANCE - 0.065 ACRES  
LIMITS OF DISTURBANCE -

ANY AREAS THAT BECAME DENUED DURING THE PROJECT DUE TO VEHICULAR OR CONSTRUCTION EQUIPMENT WILL REQUIRE STABILIZATION UPON COMPLETION.

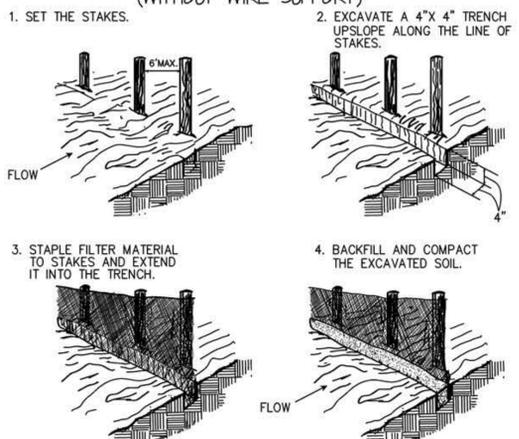
CITY OF ROANOKE STRUCTURE #8044 4-CELL CULVERT W/CONC. PVMT.

N/F PROPERTY OF ROANOKE ELECTRIC STEEL CORPORATION TAX # 6021106

N/F PROPERTY OF ROANOKE ELECTRIC STEEL CORPORATION TAX # 2720114



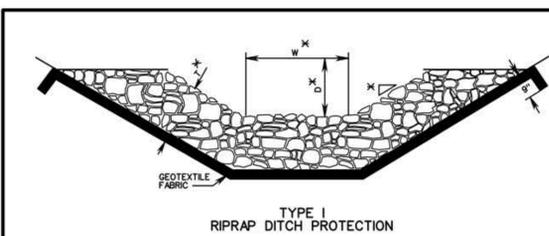
**CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)**



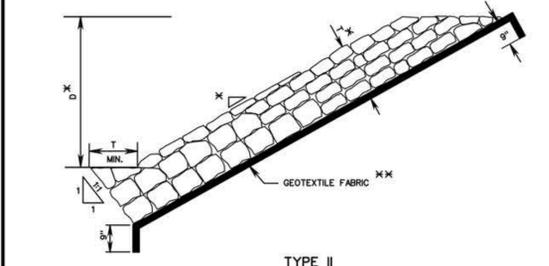
SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, DATED 1992, PLATE 3.05-2

- MAINTENANCE:**
- SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
  - CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED SILT FENCE RESULTING FROM END RUNS AND UNDERCUTTING.
  - SHOULD THE FABRIC ON A SILT FENCE DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
  - SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
  - ANY SEDIMENT DEPOSITS REMAINING IN-PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSES TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.

(SF) SILT FENCE



MINIMUM THICKNESS "T"	MINIMUM "T"
CLASS A1	20"
CLASS II	28"
CLASS I	38"
CLASS III	53"



- NOTES:**
- RP RIP RAP BEDDING MATERIAL
  - GEOTEXTILE FABRIC TO BE PROVIDED UNDER ALL RIPRAP INSTALLATIONS CLASS A1, CLASS I AND CLASS II UNLESS OTHERWISE NOTED ON THE PLANS OR DIRECTED BY THE ENGINEER.
  - RIPRAP INSTALLATIONS OF CLASS II SHALL HAVE AN INTERMEDIATE AGGREGATE BEDDING LAYER(S) AS SPECIFIED ON THE PLANS BASED ON GEOTECHNICAL RECOMMENDATIONS.
  - SEE TYPICAL SECTION SHOWN ON PLANS FOR SIDE SLOPE, BOTTOM WIDTH AND DEPTH OF CHANNEL AND RIPRAP THICKNESS.

**STANDARD RIP RAP DITCH & SLOPE PROTECTION PG-3**

VIRGINIA DEPARTMENT OF TRANSPORTATION

**TABLE 3.32-C PERMANENT SEEDING SPECIFICATIONS FOR APPALACHIAN/MOUNTAIN AREA**

LAND USE	SEED <sup>1</sup> SPECIES	APPLICATION RATES
Minimum Care Lawn (Commercial or Residential)	Tall Fescue <sup>1</sup>	90-100%
	Perennial Ryegrass <sup>2</sup>	0-10%
	Kentucky Bluegrass <sup>1</sup>	0-10%
		TOTAL: 200-250 lbs.
High-Maintenance Lawn	Minimum of three (3) up to five (5) varieties of Kentucky Bluegrass from approved list for use in Virginia <sup>1</sup>	TOTAL: 125 lbs.
General Slope (3:1 or less)	Tall Fescue <sup>1</sup>	128 lbs.
	Red Top Grass or Creeping Red Fescue	2 lbs.
	Seasonal Nurse Crop <sup>3</sup>	20 lbs.
		TOTAL: 150 lbs.
Low-Maintenance Slope (Steeper than 3:1)	Tall Fescue <sup>1</sup>	108 lbs.
	Red Top Grass or Creeping Red Fescue	2 lbs.
	Seasonal Nurse Crop <sup>3</sup>	20 lbs.
		TOTAL: 150 lbs.

- When selecting varieties of turfgrass, use the Virginia Crop Improvement Association (VCIA) recommended turfgrass variety list. Quality seed will bear a label indicating that they are approved by VCIA. A current turfgrass variety list is available at the local County Extension office or through VCIA at 804-746-4884 or at <http://sudan.cses.vt.edu/html/Turf/turfpublications/publications2.html>
- Perennial Ryegrass will germinate faster and at lower soil temperatures than Tall Fescues, thereby providing cover and erosion resistance for seedbed.
- Use seasonal nurse crop in accordance with seeding dates as stated below:
 

March, April - May 15 <sup>th</sup>	Annual Rye
May 16 <sup>th</sup> - August 15 <sup>th</sup>	Foxtail Millet
August 16 <sup>th</sup> - September, October	Annual Rye
November - February	Winter Rye
- All legume seed must be properly inoculated. If Flatpea is used, increase to 30 lbs/acre. If Weeping Lovegrass is used, include in any slope or low maintenance mixture during warmer seeding periods, increase to 30-40 lbs/acre.

**FERTILIZER & LIME**

- Apply 10-20-10 fertilizer at a rate of 500 lbs. / acre (or 12 lbs. / 1,000 sq. ft.)
  - Apply Pulverized Agricultural Limestone at a rate of 2 tons/acre (or 90 lbs. / 1,000 sq. ft.)
- NOTE:**
- A soil test is necessary to determine the actual amount of lime required to adjust the soil pH of site.
  - Incorporate the lime and fertilizer into the top 4 - 6 inches of the soil by disking or by other means.
  - When applying Slowly Available Nitrogen, use rates available in *Erosion & Sediment Control Technical Bulletin #4, 2003 Nutrient Management for Development Sites* at <http://www.dcr.state.va.us/sw/e&s.htm#pubs>

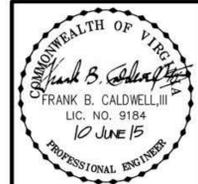
**TABLE 3.31-B TEMPORARY SEEDING SPECIFICATIONS QUICK REFERENCE FOR ALL REGIONS**

APPLICATION DATES	SPECIES	APPLICATION RATES
Sept. 1 - Feb. 15	50/50 Mix of Annual Ryegrass (lolium multi-florum) & Cereal (Winter) Rye (Secale cereale)	50 -100 (lbs/acre)
Feb. 16 - Apr. 30	Annual Ryegrass (lolium multi-florum)	60 - 100 (lbs/acre)
May 1 - Aug. 31	German Millet	50 (lbs/acre)

**FERTILIZER & LIME**

- Apply 10-10-10 fertilizer at a rate of 450 lbs. / acre (or 10 lbs. / 1,000 sq. ft.)
  - Apply Pulverized Agricultural Limestone at a rate of 2 tons/acre (or 90 lbs. / 1,000 sq. ft.)
- NOTE:**
- A soil test is necessary to determine the actual amount of lime required to adjust the soil pH of site.
  - Incorporate the lime and fertilizer into the top 4 - 6 inches of the soil by disking or by other means.
  - When applying Slowly Available Nitrogen, use rates available in *Erosion & Sediment Control Technical Bulletin #4, 2003 Nutrient Management for Development Sites* at <http://www.dcr.state.va.us/sw/e&s.htm#pubs>

(TS) TEMPORARY SEEDING



**E.S.C. PLAN & DETAILS TRANSPORTATION STRUCTURE 8044 DRAINAGE IMPROVEMENTS**  
SITUATE WESTSIDE BOULEVARD, NW ROANOKE CITY, VIRGINIA

Designed: J.V.J.  
Drawn: J.V.J.  
Checked: F.B.C.  
Date: 06/10/15  
Scale: 1"=10'  
Tax Parcel: 1040202  
N.B. No.: RKE CITY #11  
W.O. No.: 15-0025

**CWA CALDWELL WHITE ASSOCIATES**  
ENGINEERS / SURVEYORS / PLANNERS  
4203 MELROSE AVENUE, N.W.  
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ROANOKE, VIRGINIA 24017  
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