

PRE-CONSTRUCTION MEETING AND CONSTRUCTION COMMENCEMENT:

- VIRGINIA DEPARTMENT OF TRANSPORTATION:

- N/A

NAME OF DEVELOPMENT **DENISE CIRCLE
DRAINAGE IMPROVEMENTS**

MAGISTERIAL DISTRICT(S) **HOLLINS**

COUNTY OF ROANOKE

DEVELOPER (name, address, telephone) **COUNTY OF ROANOKE**

ENGINEER, ARCHITECT OR SURVEYOR (name, address, telephone) **DEPARTMENT OF DEVELOPMENT SERVICES**

TAX MAP NO(S) TAX# 039.04-01-32.00, TAX# 39.04-01-33.00, TAX# 39.04-01-26.00

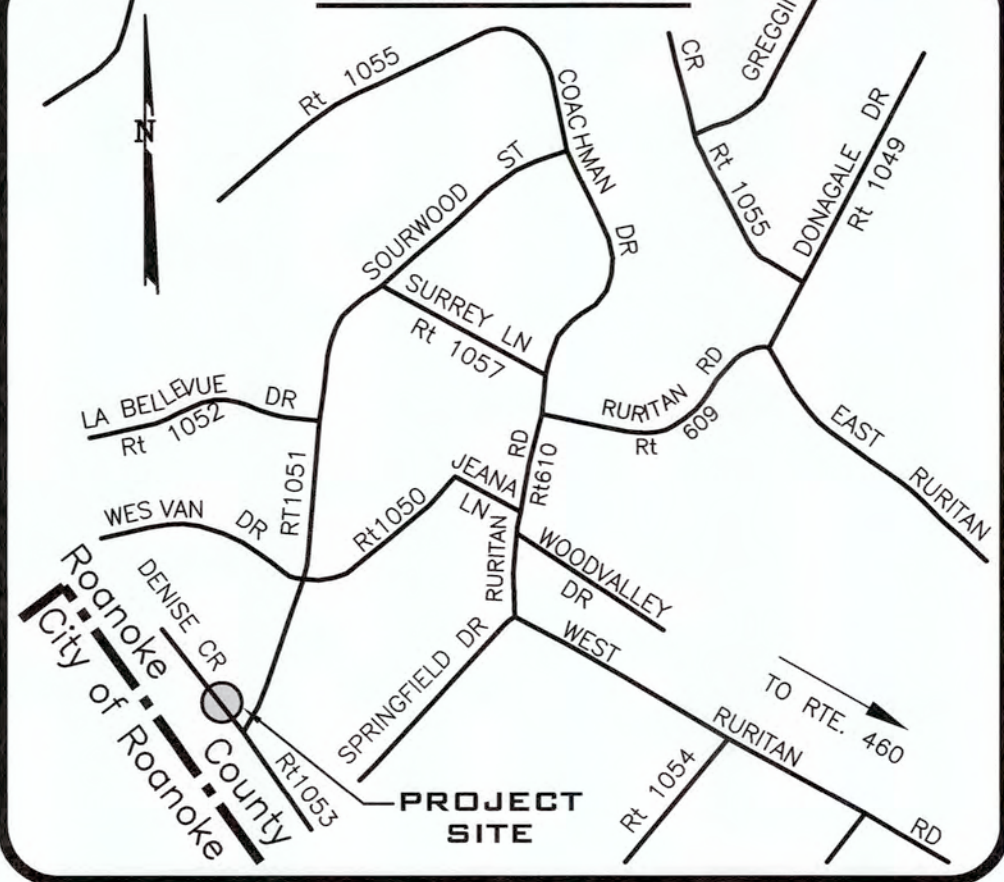
I, _____ OWNER/DEVELOPER,
AM AWARE OF THE SITE DESIGN REQUIREMENTS IMPOSED BY THIS SITE
DEVELOPMENT PLAN, ALL REVISIONS THEREOF, AND OTHER APPLICABLE
ROANOKE COUNTY CODES AND ORDINANCES.

I HEREBY CERTIFY THAT I AGREE TO COMPLY WITH THESE REQUIREMENTS SHOWN ON THIS COVER SHEET UNLESS MODIFIED IN ACCORDANCE WITH LOCAL LAW.

PRIVATE UTILITIES

- Western Virginia Water Authority
Availability letter number: N/A

VICINITY MAP



LEGEND

Underground utilities installed on private property or in private utility easements and building related storm drains shall be designed and installed per the current edition of the Virginia Uniform Statewide Building Code (including amendments). Design and installation requirements issued by the Western Virginia Water Authority that meet or exceed the USBC requirements are acceptable for private utilities. All private utilities are to be permitted through and inspected by the Roanoke County Inspections Office. Vaults, valves and other devices installed by or under the control of the Western Virginia Water Authority may not be substituted for the code required devices.

[illegible]

Revision Table

Sheet Index

1. COUNTY COVER SHEET
2. PLAN & NOTES
3. PROFILES & DETAILS
4. E&S CONTROL PLAN
5. E&S CONTROL NARRATIVE
6. MAINTENANCE OF TRAFFIC PLAN

SURVEY INFORMATION

Horizontal and vertical control surveys were performed in year: 2022
By: NICKIE D. MILLS, P.E., L.S.

All vertical elevations must be referenced to the National Geodetic Vertical Datum of 1929 or 1988
All horizontal data must be referenced to the North American Datum of 1927 or 1983.

Horizontal Datum: ASSUMED Vertical Datum: ASSUMED

Source of topographic mapping is dated GIS TOPO SHOWN OUTSIDE
OF LIMITS OF FIELD SURVEY.

RECORDS &
LIMITED SURVEY dated: MARCH 17, 1971 (P.B. 7 PG. 71)

Benchmark Information: BENCHMARK SET IN FIELD AND SHOWN ON PLANS.

The professional seal and signature certifies the boundary survey and topographic mapping to be accurate and correct.

QUANTITY & COST ESTIMATE

ITEM	QUANTITY	UNIT	UNIT PRICE	COST	BONDABLE
CLEARING AND GRUBBING		AC			
EXCAVATION		C.Y.			
EMBANKMENT		C.Y.			
CURB INLET DI-		EA			
CURB INLET DI-		EA			
MANHOLE MH-		EA			
MANHOLE MH-		EA			
-IN. CONCRETE PIPE, CLASS III		LF			
-IN. CONCRETE PIPE, CLASS IV		LF			
-IN. C.M. CULVERT		LF			
-IN. C.M. CULVERT		LF			
BOX CULVERT		LS			
PAVED SWALE		LF			
RIPRAP - CLASS		SF			
PERMANENT GRASS SWALE		LF			
-IN. CONCRETE ENDWALL. EW-		EA			
-IN. END SECTION ES-		EA			
HEADER CURB & GUTTER CG-		LF			
CURB & GUTTER CG-		LF			
VALLEY GUTTER		EA			
GRAVEL BASE		SY			
GRAVEL SHOULDER		SY			
SURFACE TREATMENT		SY			
-IN. BIT. CONC.: TYPE B-		SY			
-IN. BIT. CONC.: TYPE S-		SY			
-IN. BASE MATERIAL		C.Y.			
-IN. SUBBASE MATERIAL		C.Y.			
TRAFFIC BARRICADE		EA			
8" WATER LINE		LF			
6" WATER LINE		LF			
FIRE HYDRANT ASSEMBLIES		EA			
BLOW OFFS W/ VAULT, FRAME & COVER		EA			
-IN. GATE VALVES, W/ VAULT, FRAME & COVER		EA			
-IN. GATE VALVES, W/ VAULT, FRAME & COVER		EA			
8" SANITARY SEWER		LF			
STANDARD MANHOLE W/FRAME & COVER		EA			
SAMPLING MANHOLE/PORT		EA			
LANDSCAPING		LS			
AMENITIES (INCLUDING BUT NOT LIMITED TO TRAILS, ETC...)		LS			
STORMWATER MANAGEMENT		LS			
AS-BUILT PLANS (STORM SEWER SYSTEMS)		LS			
AS-BUILT PLANS (STORMWATER MANAGEMENT)		LS			
10% CONTINGENCY					
ESTIMATED TOTAL					
BY SEALING THE PLANS, THE DESIGN PROFESSIONAL HEREBY CERTIFIES THAT THE FOREGOING ESTIMATE REFLECTS THE CURRENT IMPROVEMENT COSTS OF THIS PROJECT.					

			LF		
			SF		
			LF		
			EA		
			EA		
			LF		
			LF		
			EA		
			SY		



ROANOKE
COUNTY VA
ENGINEERING
ROANOKECOUNTYVA.GOV

5204 Bernard Drive
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ROANOKE COUNTY
DEPARTMENT OF
DEVELOPMENT SERVICES

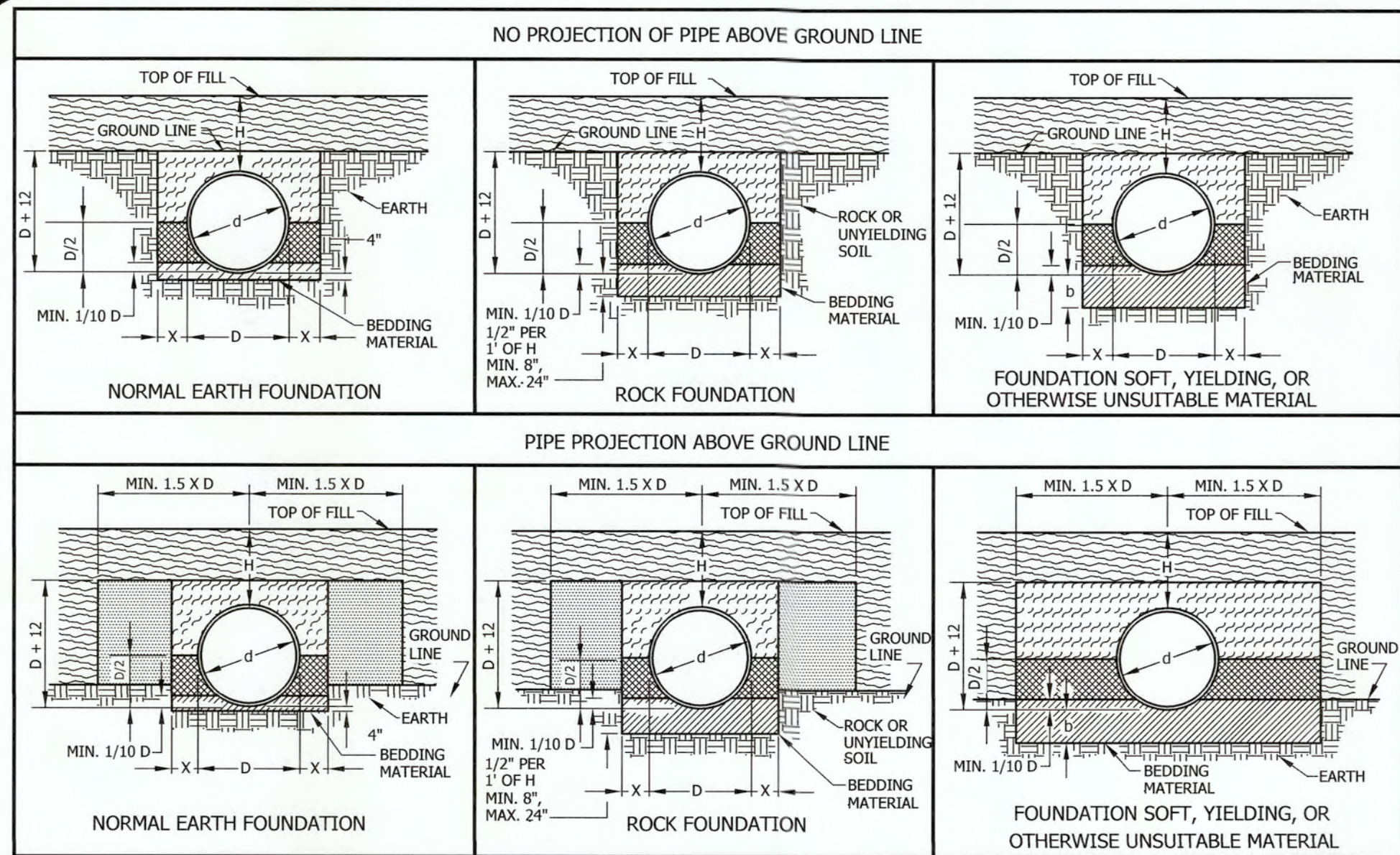
DATE: 3/7/2023



4th Review

**Denise Circle
Drainage Improvements**
2044 Denise Circle, Rte, 1053
County of Roanoke, Virginia

SHEET
1
OF
6



LEGEND:

- BEDDING MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- CLASS 1 BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- FOR PLASTIC PIPE CLASS 1 BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- FOR ALL OTHER PIPE REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- EMBANKMENT
- REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

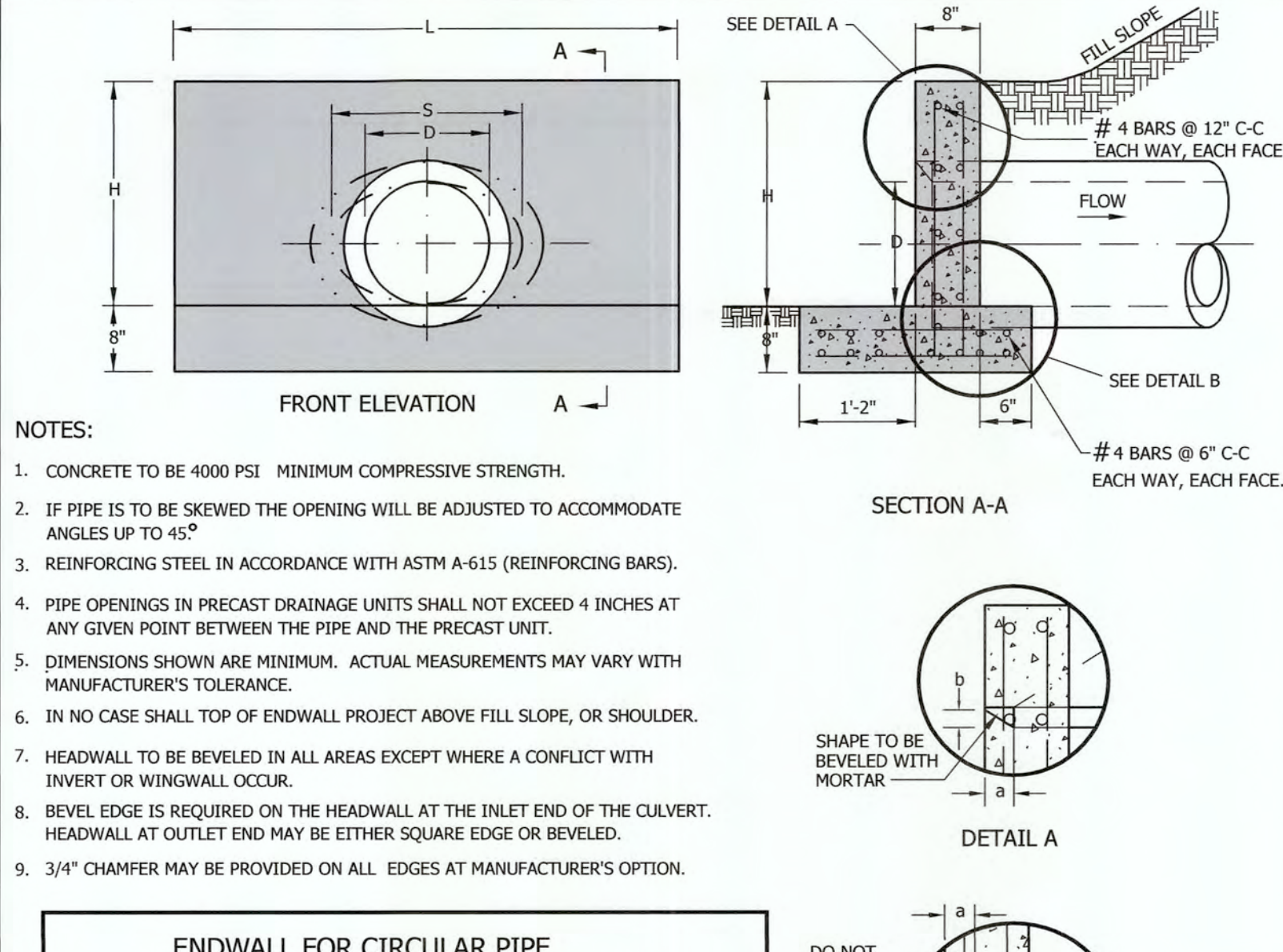
NOTES:

- CRUSHED GLASS CONFORMING TO THE SIZE REQUIREMENTS FOR CRUSHER RUN AGGREGATE SIZE 25 AND 26 MAY BE USED IN PLACE OF CLASS 1 BACKFILL.
- #57 WILL NOT BE USED AS BACKFILL OR BEDDING.

DEFINITIONS:

- H = HEIGHT OF COVER MEASURED FROM TOP OF DRAINAGE STRUCTURE TO FINISHED GRADE.
- D = OUTSIDE DIAMETER OF PIPE.
- d = INSIDE DIAMETER OF PIPE.
- b = DEPTH AS SHOWN ON PLANS OR TO FIRM BEARING SOIL.

PB-1 (INSTALL. OF PIPE CULVERTS AND STORM SEWERS) **CIRC. PIPE BEDDING AND BACKFILL - METHOD "A")**



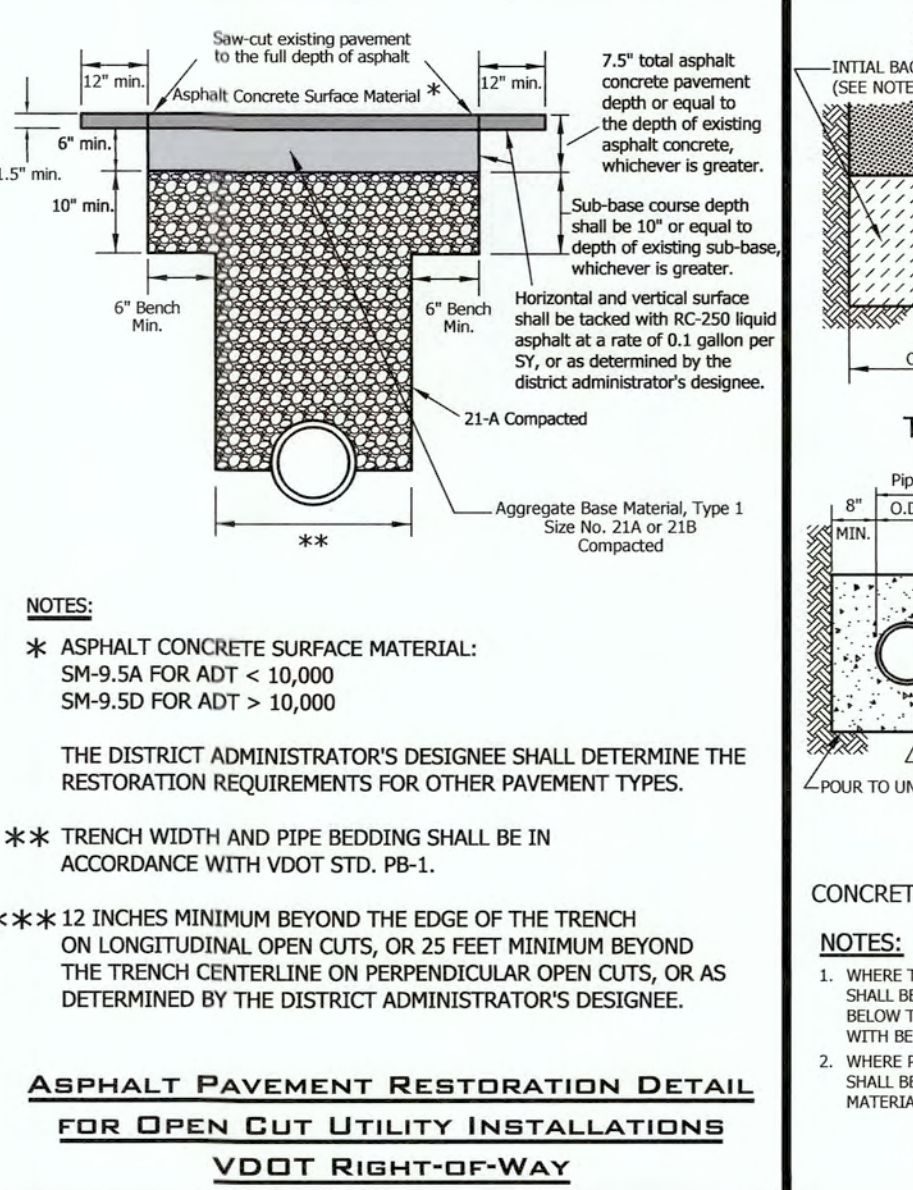
ENDWALL FOR CIRCULAR PIPE

DIAMETER OF PIPE CULVERT	
D	12" 15" 18" 21" OR 24" 27" OR 30" 33" OR 36"
H	2'-3 3/4" 2'-3" 2'-6" 3'-2" 3'-13 3/4" 4'-4"
L	4'-3 3/4" 5'-3 3/4" 6'-3 3/4" 8'-3 3/4" 10'-3 3/4" 12'-3 3/4"
a	0'-11 1/4" 0'-13 3/4" 0'-2" 0'-2 1/2" 0'-3 1/4" 0'-3 3/4"
b	0'-1" 0'-1 1/4" 0'-1 1/2" 0'-2" 0'-2 1/2" 0'-3"

NOTES:

- CONCRETE TO BE 4000 PSI MINIMUM COMPRESSIVE STRENGTH.
- IF PIPE IS TO BE SKEWED THE OPENING WILL BE ADJUSTED TO ACCOMMODATE ANGLES UP TO 45°.
- REINFORCING STEEL IN ACCORDANCE WITH ASTM A-615 (REINFORCING BARS).
- PIPE OPENINGS IN PRECAST DRAINAGE UNITS SHALL NOT EXCEED 4 INCHES AT ANY GIVEN POINT BETWEEN THE PIPE AND THE PRECAST UNIT.
- DIMENSIONS SHOWN ARE MINIMUM. ACTUAL MEASUREMENTS MAY VARY WITH MANUFACTURER'S TOLERANCE.
- IN NO CASE SHALL TOP OF ENDWALL PROJECT ABOVE FILL SLOPE, OR SHOULDER.
- HEADWALL TO BE BEVELED IN ALL AREAS EXCEPT WHERE A CONFLICT WITH INVERT OR WINGWALL OCCUR.
- BEVEL EDGE IS REQUIRED ON THE HEADWALL AT THE INLET END OF THE CULVERT. HEADWALL AT OUTLET END MAY BE EITHER SQUARE EDGE OR BEVELED.
- 3/4" CHAMFER MAY BE PROVIDED ON ALL EDGES AT MANUFACTURER'S OPTION.

EW-1 (END WALL) 12" TO 36" CIRCULAR PIPE



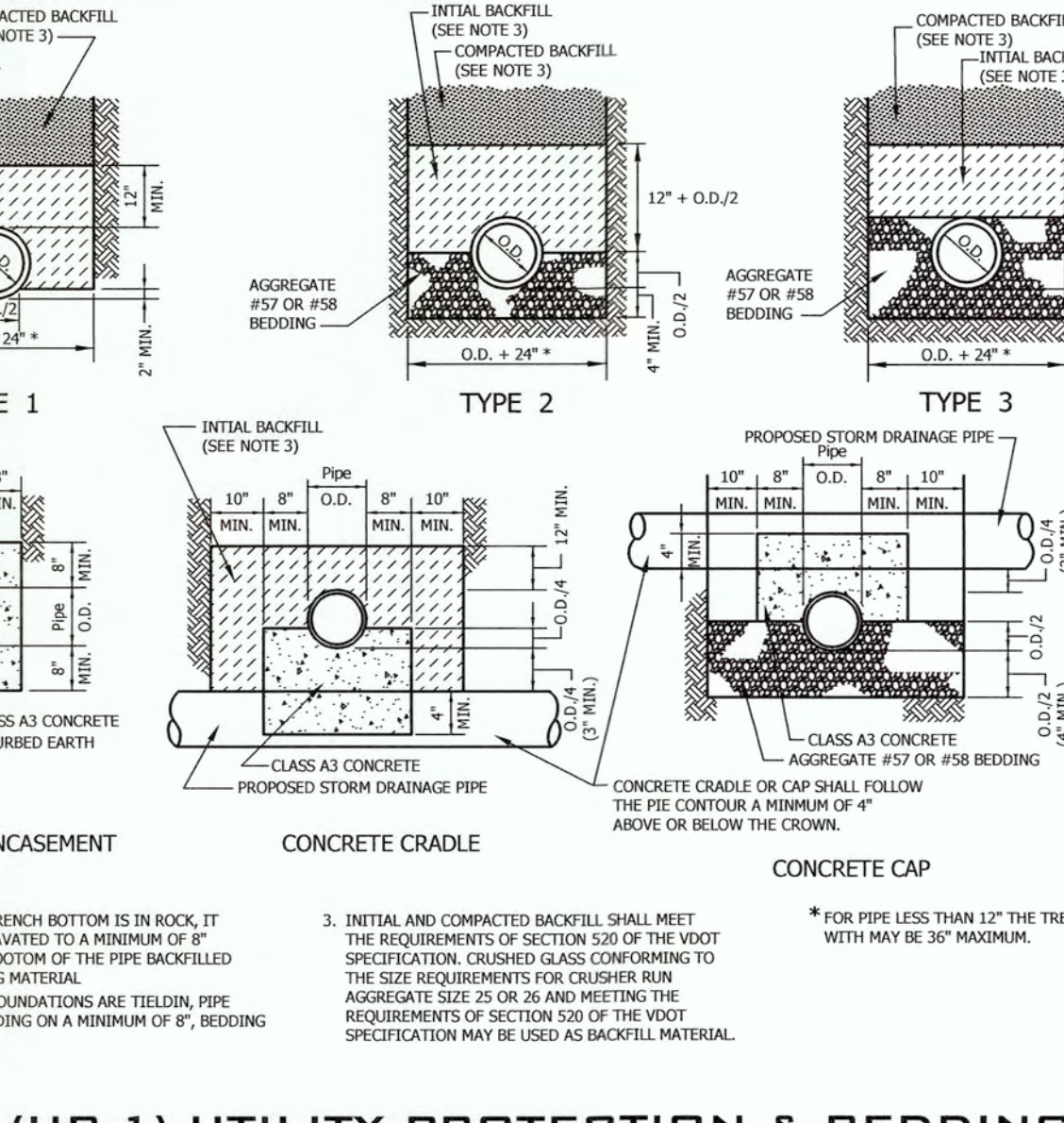
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- HEADWALL TO BE BEVELED IN ALL AREAS EXCEPT WHERE A CONFLICT WITH INVERT OR WINGWALL OCCUR.
- BEVEL EDGE AS REQUIRED ON THE HEADWALL AT THE INLET END OF THE CULVERT (WHERE THE FLOW ENTERS THE CULVERT).
- HEADWALL AT THE OUTLET END OF THE CULVERT MAY BE EITHER SQUARE EDGE OR BEVEL EDGE.
- 3/4" CHAMFER MAY BE PROVIDED ON ALL EDGES AT MANUFACTURER'S OPTION.

EW-2PC (PRECAST ENDWALL FOR 42" TO 96" CIR. PIPE CULVERTS)



ENDWALL FOR CIRCULAR PIPE

DIAMETER OF PIPE CULVERT	
D	12" 15" 18" 21" OR 24" 27" OR 30" 33" OR 36"
H	2'-3 3/4" 2'-3" 2'-6" 3'-2" 3'-13 3/4" 4'-4"
L	4'-3 3/4" 5'-3 3/4" 6'-3 3/4" 8'-3 3/4" 10'-3 3/4" 12'-3 3/4"
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b	0'-1" 0'-1 1/4" 0'-1 1/2" 0'-2" 0'-2 1/2" 0'-3"

NOTES:

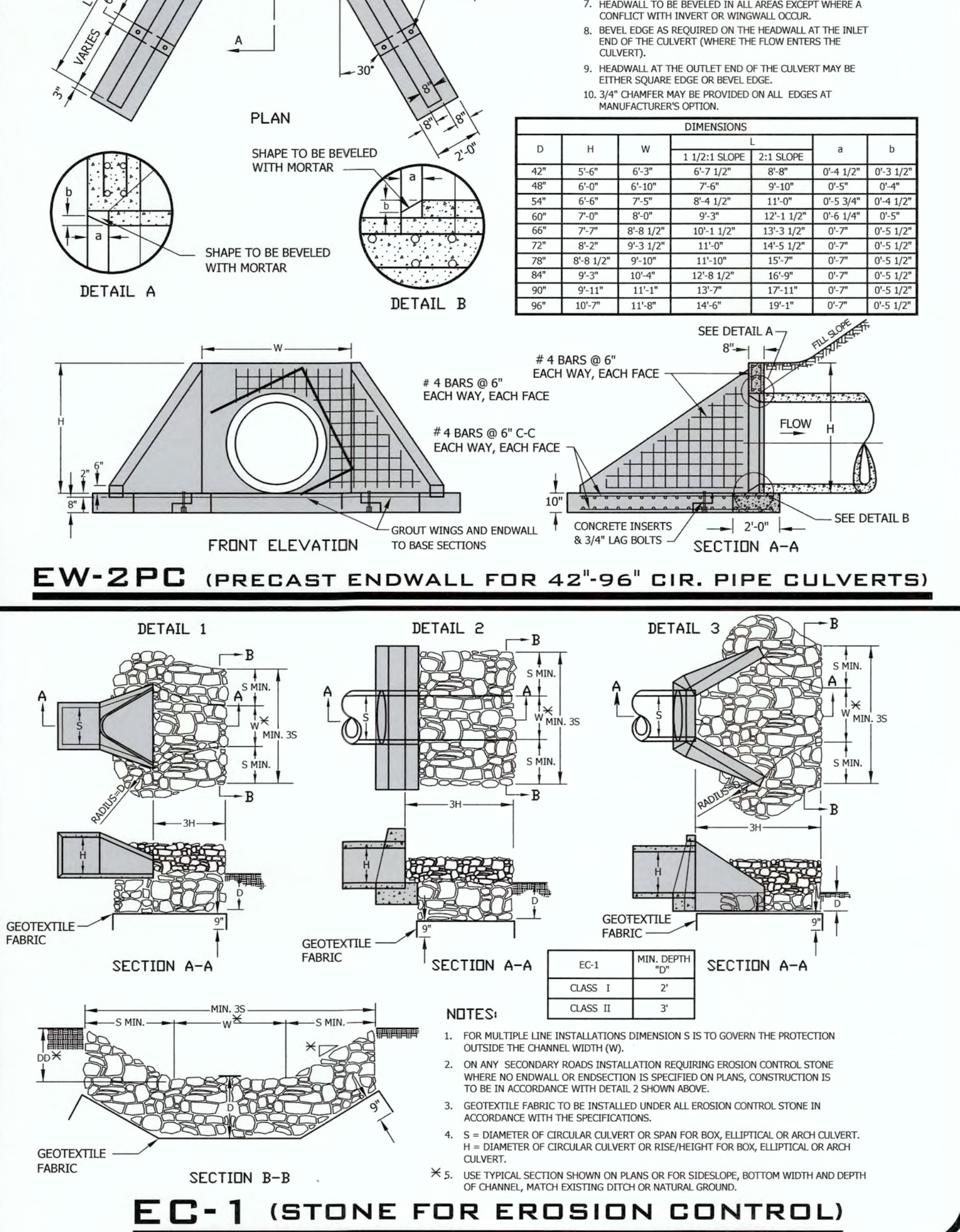
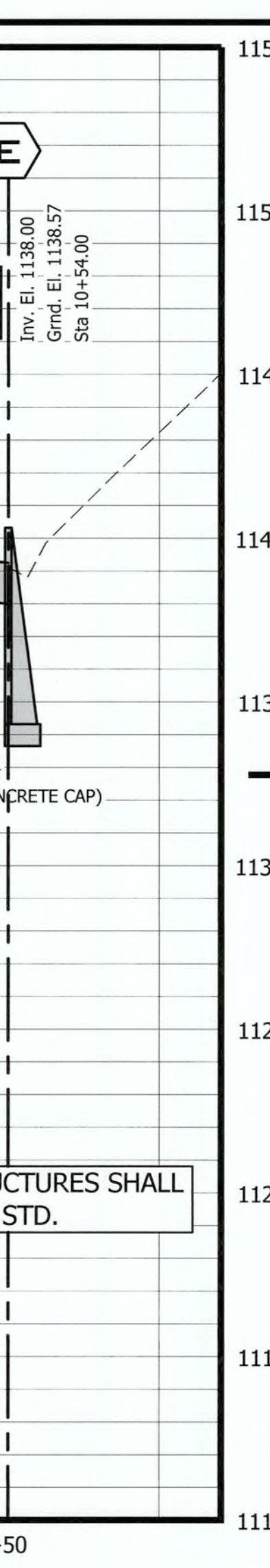
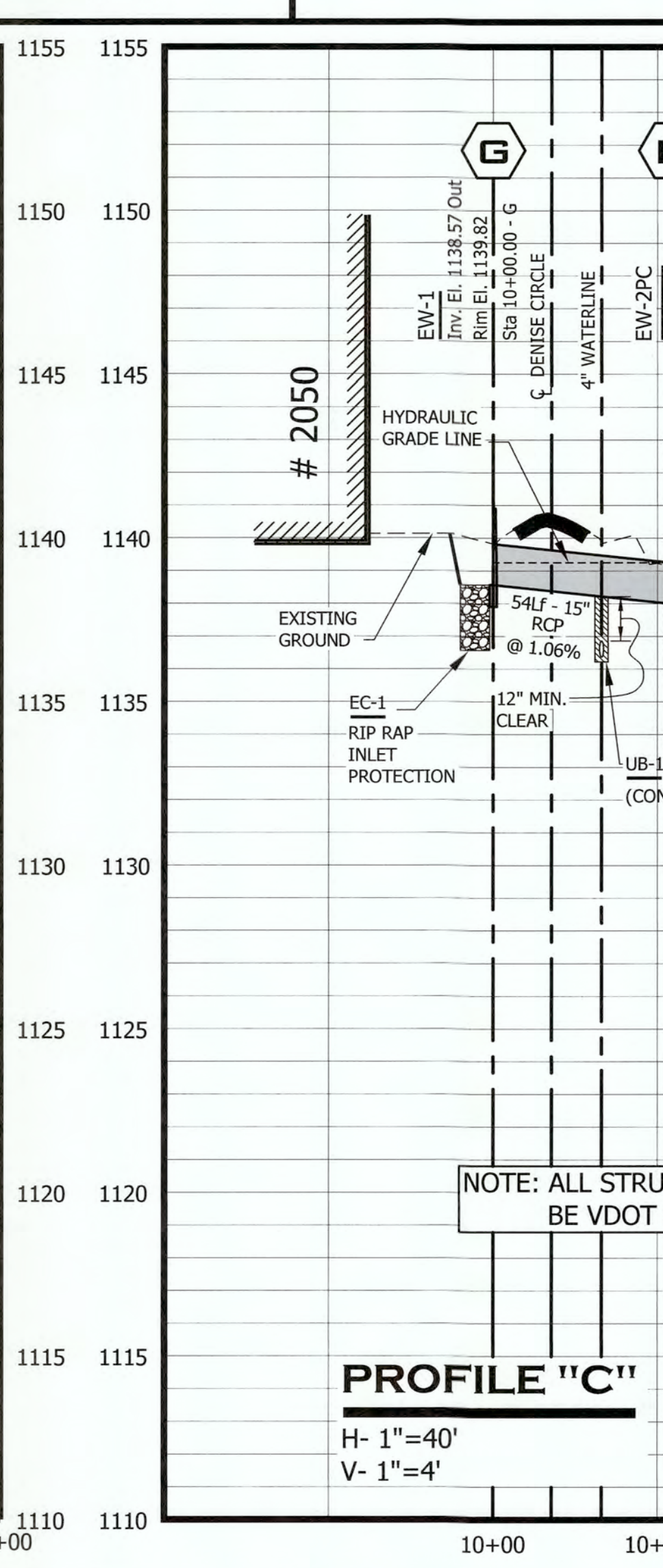
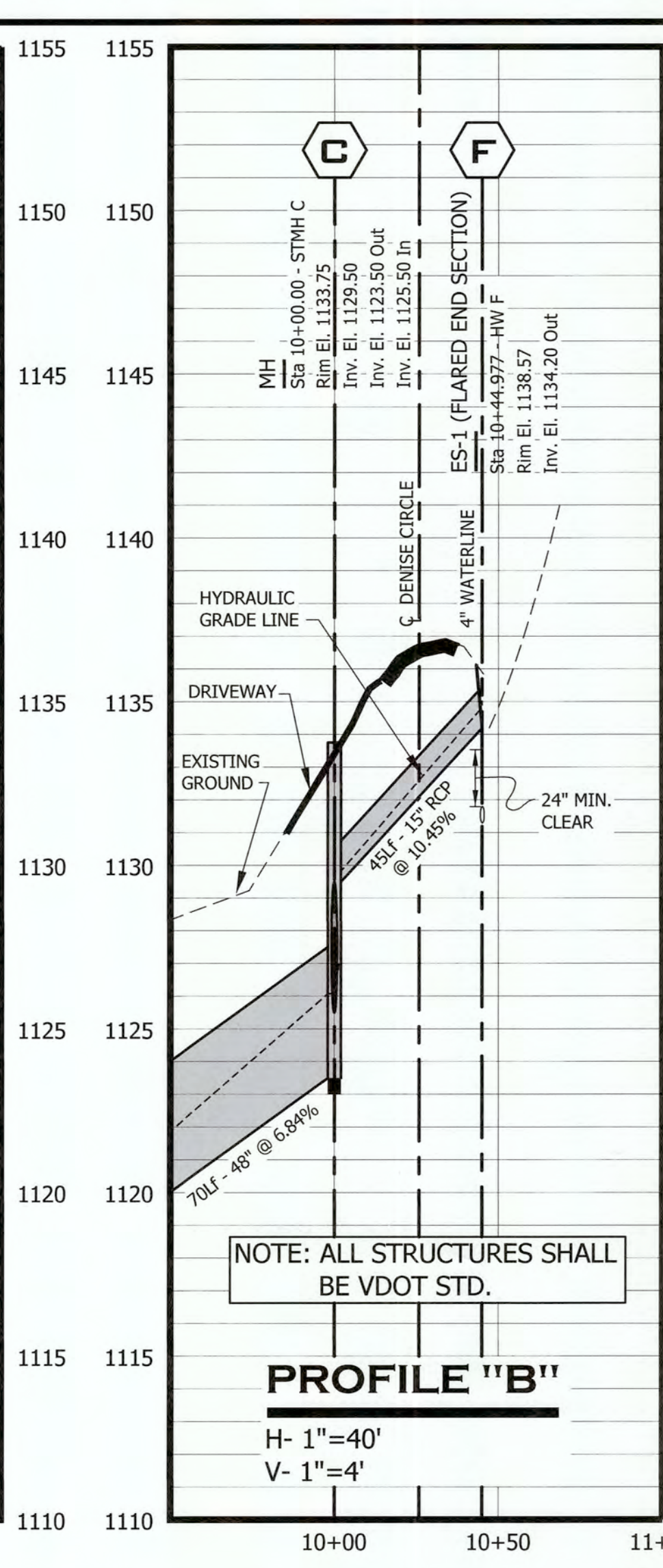
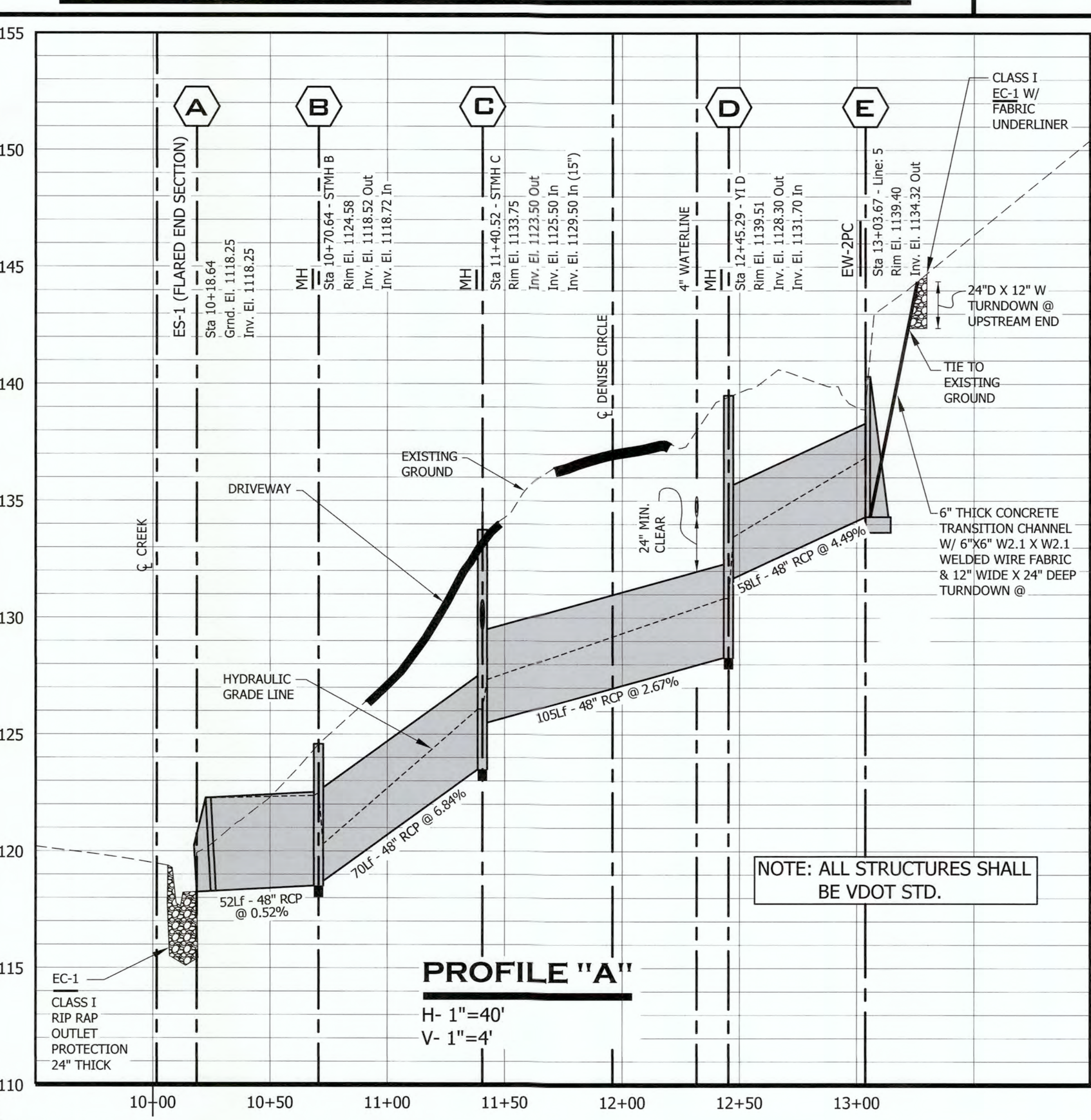
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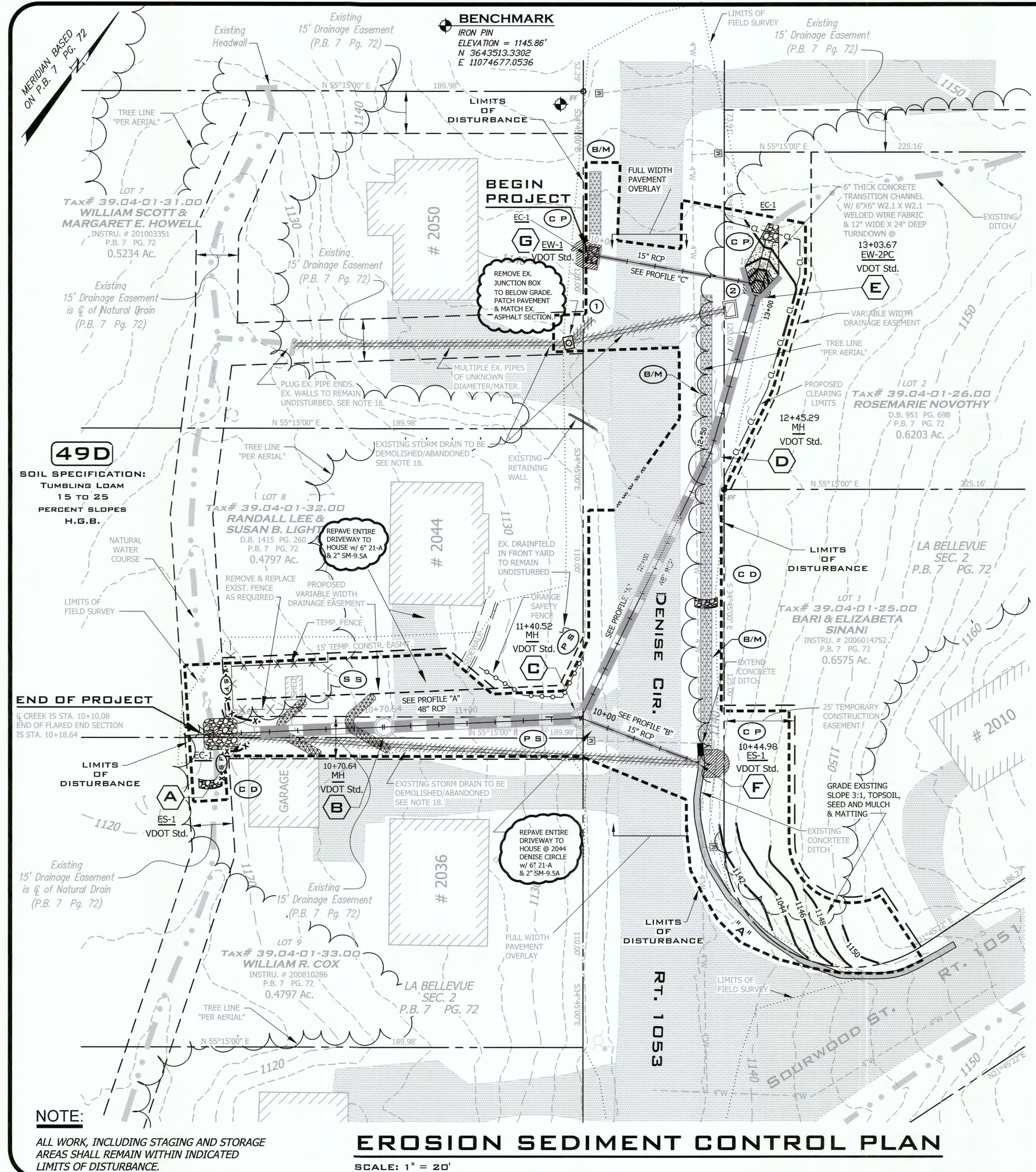
EC-1 (STONE FOR EROSION CONTROL)

ROANKE COUNTY DEPT. OF DEVELOPMENT SERVICES
5204 Bernard Drive
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PROFESSIONAL ENGINEER SEAL AND SIGNATURE

NICKIE D. MILLS
LICENSE NO. 0402031205
7-7-23





PS PERMANENT SEEDING MIXTURE

TYPE A
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 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

TYPE B (SLOPES 3:1 OR STEEPER)
15 MARCH TO 1 MAY
CROWN VETCH @ 1/2 LB / 1000 SF
PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF
RED TOP @ 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 @ 1/2 LB / 1000 SF

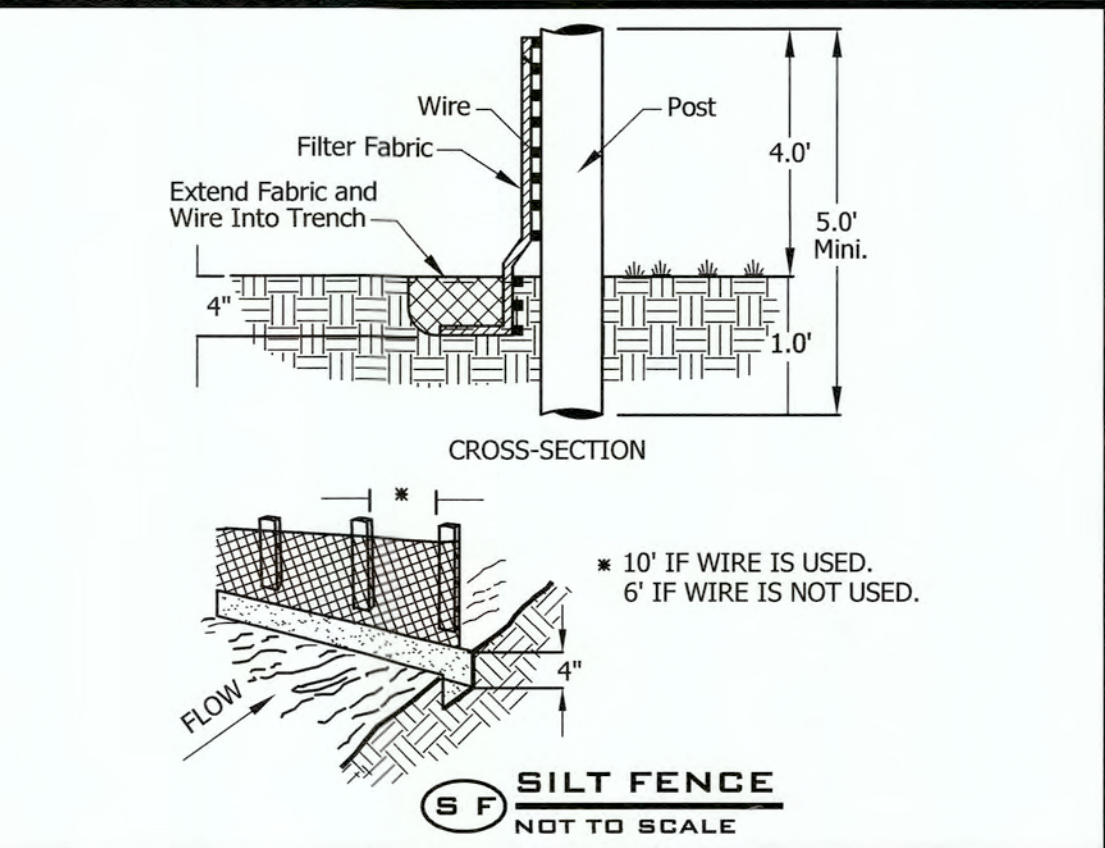
LIME: 140 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE
FERTILIZER: 5-20-10 @ 25 LB / 1000 SF
38-0-0 @ 7 LB / 1000 SF

MULCH: IF REQUIRED, SHALL BE USED OVER ALL SEEDED AREAS AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 1.25 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

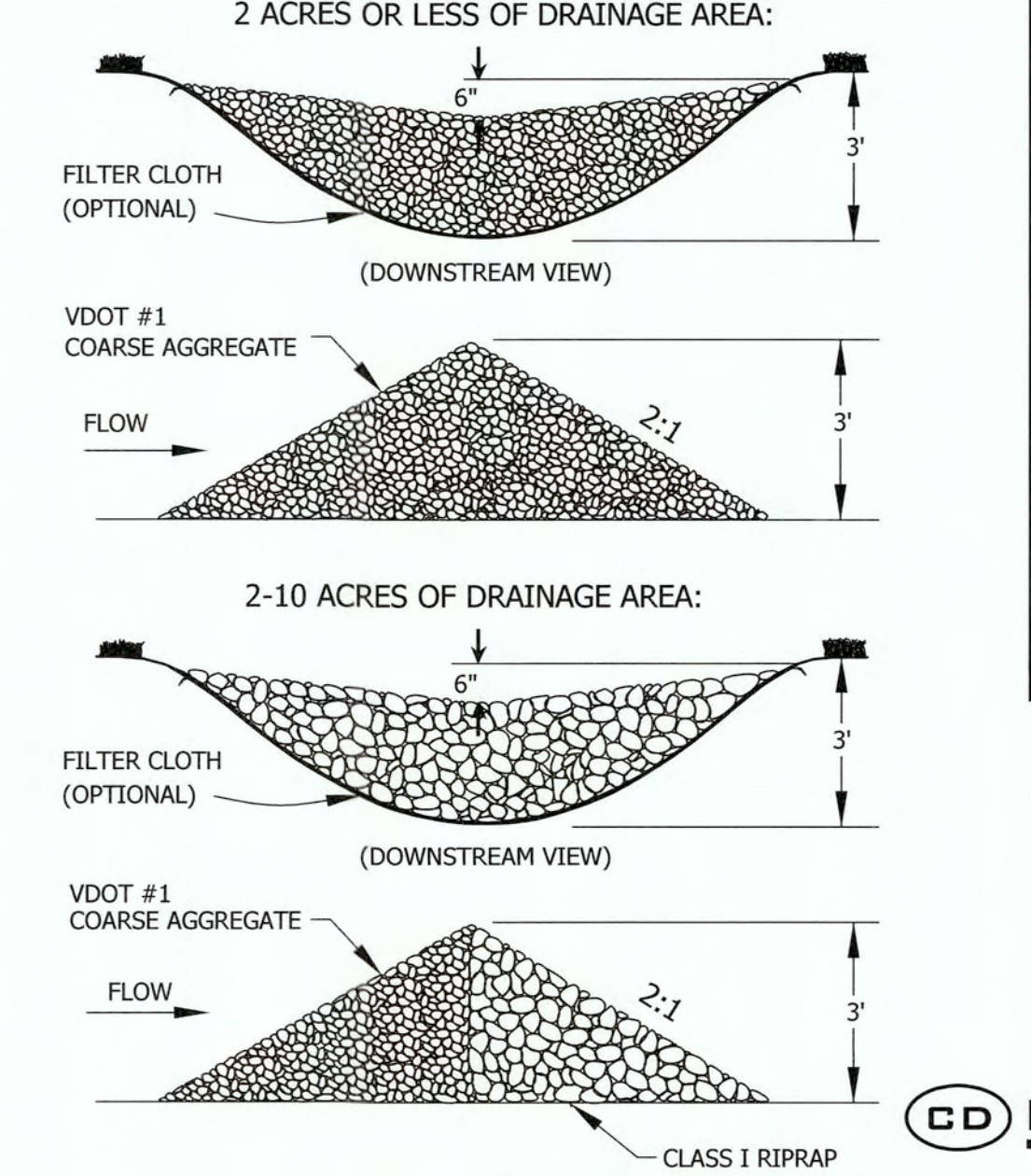
SOIL CONDITIONING: INCORPORATION OF LIME AND FERTILIZER, SELECTION OF CERTIFIED SEED, MULCHING, MAINTENANCE OF NEW SEEDINGS, AND RESEEDING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS CONTAINED WITHIN THE VIRGINIA SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. ADDITIONAL SEEDING TO BE PERFORMED AS REQUIRED BY THE INSPECTOR.

SEED APPLICATION: APPLY SEED UNIFORMLY WITH A CYCLOPE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

TOTAL DISTURBED AREA = **0.4241 AC. = 18,472 SQ. FT.**



Symbol	Description
(B/M)	SOIL STABILIZATION MAT (EC-3 TYPE B)
(T S)	TEMPORARY SEEDING
(P S)	PERMANENT SEEDING
(S F)	SILT FENCE
(C E)	CONSTRUCTION ENTRANCE
(C P)	CULVERT INLET PROTECTION
(O P)	OUTLET PROTECTION
(C D)	ROCK CHECK DAM
(S S)	SILT SOCK

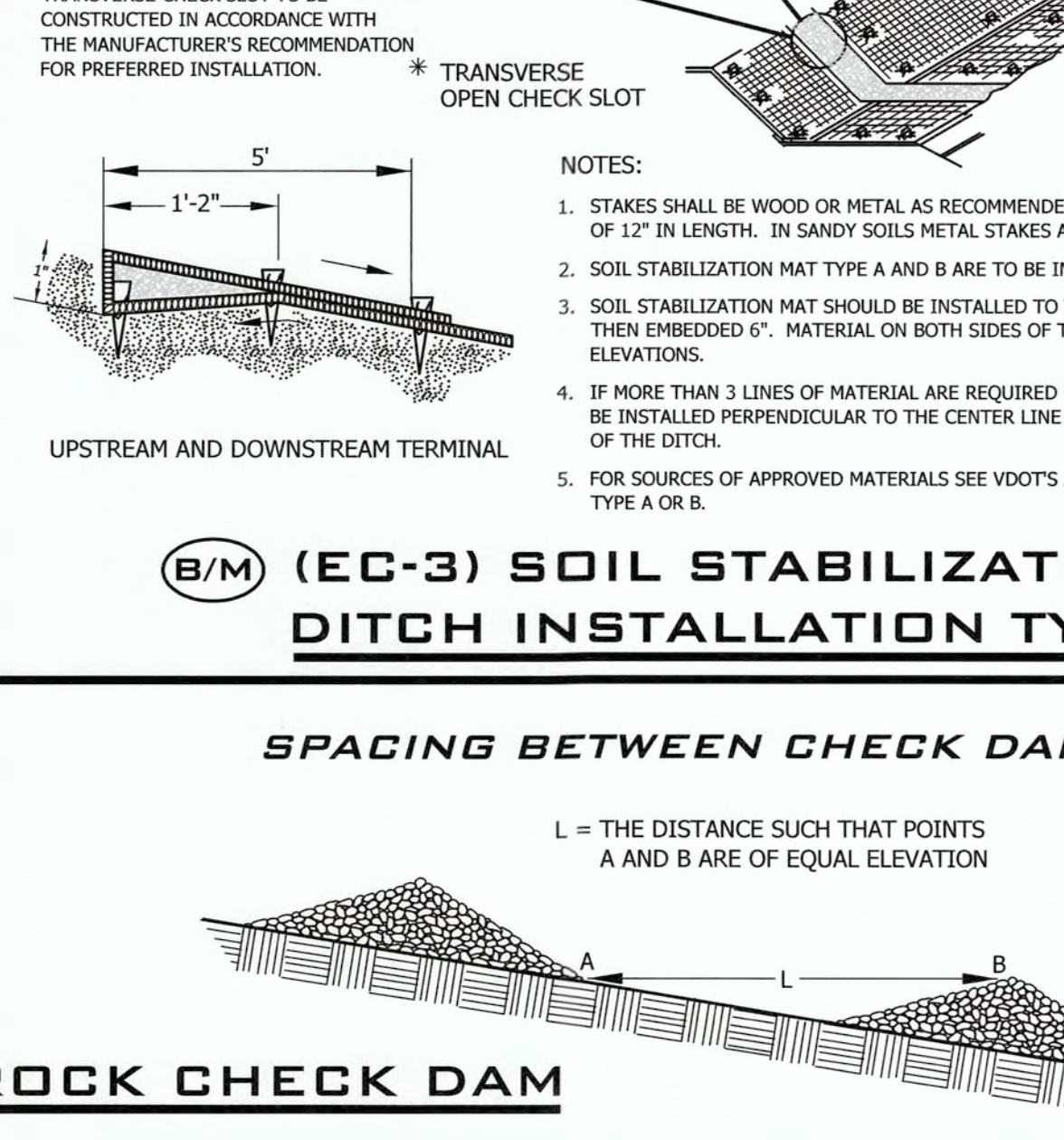
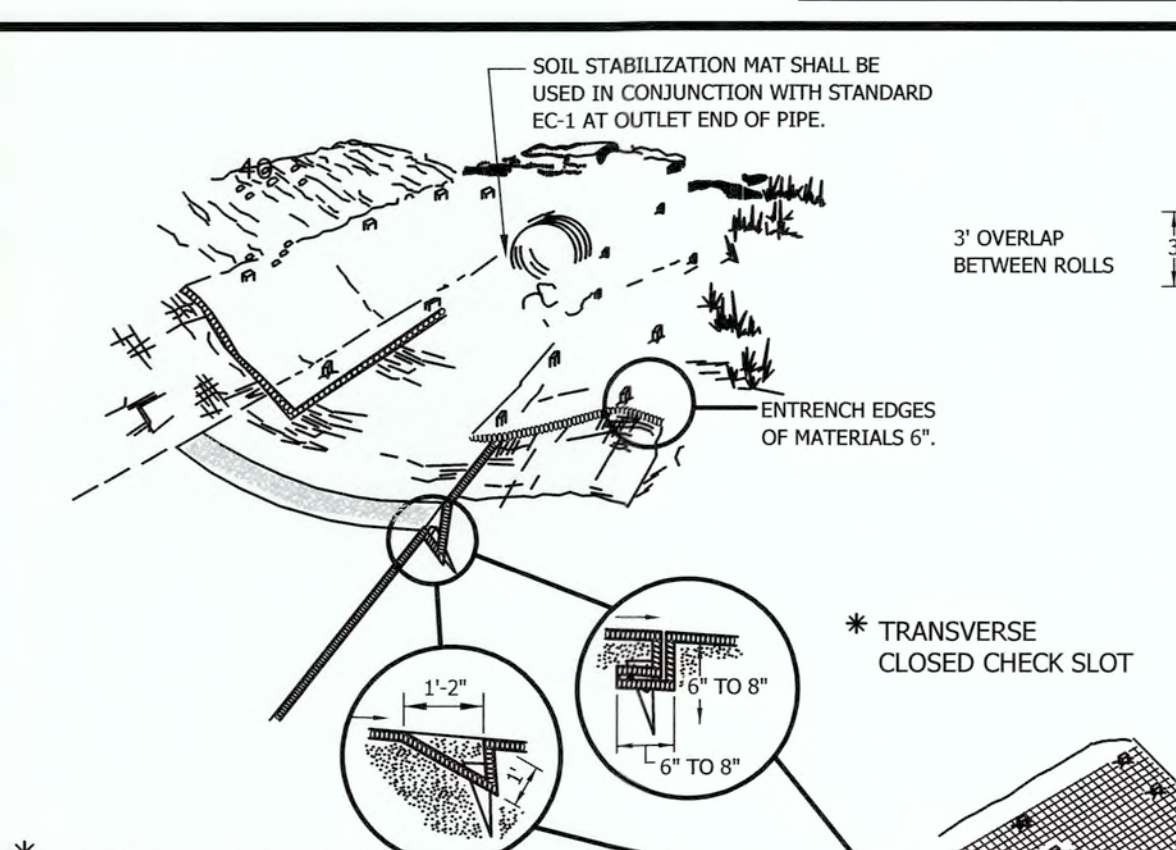
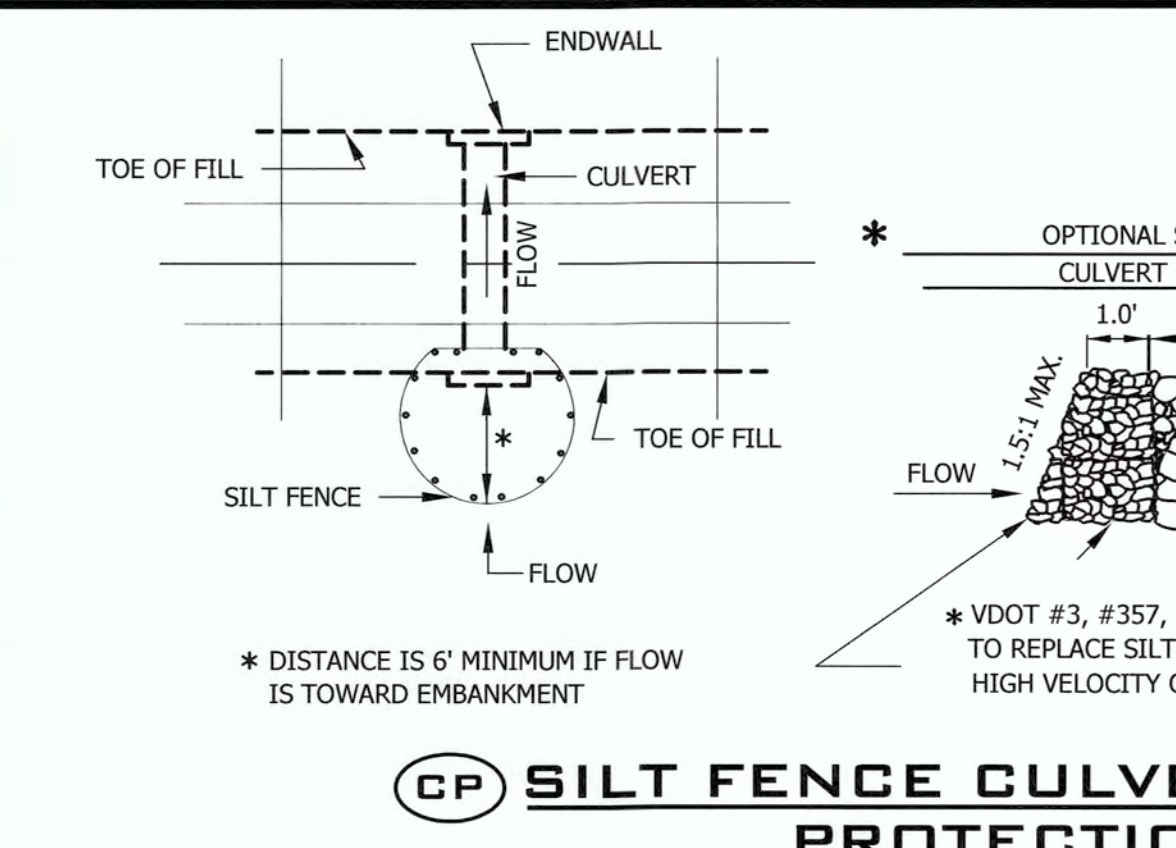


SITEWORK

- Subgrade shall be formed ensuring positive drainage and be free of large boulders and other large construction debris.
- Topsoil will be installed and uniformly graded to a consistent four-inch depth over the entire planting area.
- Soil to be friable loam with adequate organic content.
- Soil to be free of rock, roots, clods, and foreign material, including construction debris and gravel.

SEEDING SPECIFICATIONS

- Seed blend shall consist of a three-way turf-type fescue.
- Seed shall be blue tag certified category one.
- Seed shall be clearly labeled.
- New seeding to be applied at a rate of eight pounds per 1000 square feet.
- Newly seeded areas to be fertilized using a formula with a 1-3-1 npk at a rate of 1/4 pound nitrogen per 1000 square feet.
- Soils to be tested to determine if additional amendments are needed.
- Prepared seedbed will have quality topsoil a minimum of six inches depth, free of rocks, roots, or debris.
- Seed shall be applied in two different directions.
- Seed shall be mechanically incorporated into the top 1/2 inch of the proposed surface.
- Seeded surface shall be mulched with blown straw at a rate of two bales per 1000 square feet then tacked using a hydro-mulcher and paper mulch product. adjacent hard surface will be cleaned from the seeding and mulching operations.



PROFESSIONAL ENGINEER SEAL AND SIGNATURE

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GENERAL EROSION AND SEDIMENT CONTROL NOTES

- 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.
- 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.
- 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.
- IN NO CASE DURING CONSTRUCTION SHALL WATER RUNOFF BE DIVERTED OR ALLOWED TO FLOW TO LOCATIONS WHERE ADEQUATE PROTECTION HAS NOT BEEN PROVIDED.
- 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.
- 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 AND KEYS ARE TO BE UTILIZED ON ALL EROSION CONTROL PLANS SUBMITTED TO ROANOKE COUNTY.
- THE LOCATION OF ALL OFF-SITE FILL OR BORROW AREAS ASSOCIATED WITH THE CONSTRUCTION PROJECT WILL BE PROVIDED TO ROANOKE COUNTY DEPARTMENT OF DEVELOPMENT SERVICES. AN EROSION CONTROL PLAN OR MEASURES MAY BE REQUIRED FOR THIS AREA.
- THIS SHEET MAY NOT BE MODIFIED EXCEPT FOR TABLES.

TOTAL DISTURBED AREA = **0.4241** AC. = **18,472** SQ. FT.

BMP INFORMATION TABLE

BMP TYPE	BMP #1
NAME OF AUTHORIZED NUTRIENT BANK	-
REQUIRED PHOSPHORUS TO BE REMOVED (LB/YR)	LBS
AMOUNT OF PHOSPHORUS CREDIT PURCHASED (LB/YR)	LBS
TECHNICAL REQUIREMENT MET (PART 11B OR 11C)	-
TOTAL AREA TREATED (AC)	-
IMPERVIOUS AREA TREATED BY BMP (AC)	-
MANAGED TURF AREA TREATED BY BMP	-
OPEN SPACE/FORESTED AREA TREATED BY BMP (AC)	-
SURFACE AREA OF BMP (AC)	-
STORAGE VOLUME OF BMP (CU YD)	-
QUALITY, QUANTITY, OR TYPE	-
TMDL ADDRESSED? (PHOSPHORUS, BACTERIA, SEDIMENT, ETC)	-
NAME OF RECEIVING WATER (PROJECT SITE)	-
HYDROLOGIC UNIT CODE FOR PROJECT SITE (ALPHANUMERIC CODE RU14, ECT)	-
MAXIMUM AVERAGE DEPTH (FT)	-
LATITUDE (DECIMAL DEGREES XX.XXXX)	-
LONGITUDE (DECIMAL DEGREES XX.XXXX)	-

STORMWATER SITE STATISTICS

	EXISTING	PROPOSED
TOTAL DISTURBED AREA (AC)	---	---
TOTAL SITE (AC)	---	---
IMPERVIOUS AREA (AC)	---	---
MANAGED TURF AREA (AC)	---	---
OPEN SPACE/FOREST (AC)	---	---
PUBLIC RIGHT OF WAY DISTURBANCE (SF)	---	---
KARST PRESENT (Y/N)	---	---

MODIFIED VIRGINIA CODING SYSTEM FOR EROSION & SEDIMENT CONTROL PRACTICES

REFER TO SHEET 8 FOR DETAILS OF IMPLEMENTED MEASURES

NO.	TITLE	KEY	SYMBOL	NO.	TITLE	KEY	SYMBOL
3.01	SAFETY FENCE	(SAF)		3.21	LEVEL SPREADER	(LS)	
3.02	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE	(CE)		3.22	VEGETATIVE STREAMBANK STABILIZATION	(VSS)	
3.03	CONSTRUCTION ROAD STABILIZATION	(CRS)		3.23	STRUCTURAL STREAMBANK STABILIZATION	(SSS)	
3.04	STRAW BALE BARRIER	(STB)		3.24	TEMPORARY VEHICULAR STREAM CROSSING	(VSC)	
3.05	SILT FENCE	(SF)		3.25	UTILITY STREAM CROSSING	(USC)	
3.06	BRUSH BARRIER	(BB)		3.26	DEWATERING STRUCTURE	(DS)	
3.07	STORM DRAIN INLET PROTECTION	(IP)		3.27	TURBIDITY CURTAIN	(TC)	
3.08	CULVERT INLET PROTECTION	(CIP)		3.28	SUBSURFACE DRAIN	(SD)	
3.09	TEMPORARY DIVERSION DIKE	(DD)		3.29	SURFACE ROUGHENING	(SR)	
3.10	TEMPORARY FILL DIVERSION	(FD)		3.30	TOPSOILING	(TO)	
3.11	TEMPORARY RIGHT-OF-WAY DIVERSION	(RWD)		3.31	TEMPORARY SEEDING	(TS)	
3.12	DIVERSION	(DV)		3.32	PERMANENT SEEDING	(PS)	
3.13	TEMPORARY SEDIMENT TRAP	(ST)		3.33	SODDING	(SO)	
3.14	TEMPORARY SEDIMENT BASIN	(SB)		3.34	BERMUDA GRASS AND ZOYSIAURASS ESTABLISHMENT	(B&Z)	
3.15	TEMPORARY SLOPE DRAIN	(TSD)		3.35	MULCHING	(MU)	
3.16	PAVED FLUME	(PF)		3.36	SOIL STABILIZATION BLANKETS & MATTING	(BS&M)	
3.17	STORMWATER CONVEYANCE CHANNEL	(SCC)		3.37	TREES, SHRUBS, VINES AND GROUND COVERS	(VEG)	
3.18	OUTLET PROTECTION	(OP)		3.38	TREE PRESERVATION AND PROTECTION	(TP)	
3.19	RIPRAP	(RR)		3.39	DUST CONTROL	(DC)	
3.20	ROCK CHECK DAMS	(CD)					

EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION: THE PURPOSE OF THIS PROJECT IS THE CONSTRUCTION OF A STORM DRAIN FOR ADJACENT DEVELOPMENT RUNOFF. THE PROJECT IS LOCATED ON DENISE CIRCLE IN ROANOKE COUNTY, VIRGINIA. THE DISTURBED AREA FOR THIS PROJECT IS APPROXIMATELY 0.4241 AC.

EXISTING SITE CONDITIONS: THE LIMITS OF DISTURBANCE IS LOCATED WITHIN THE SUBJECT PROPERTIES, IDENTIFIED AS ROANOKE COUNTY TAX PARCEL #39.04-01-25.00, #39.04-01-26.00, #39.04-01-31.00, #39.04-01-32.00 AND #39.04-01-33.00. THE SITE IS CURRENTLY A MIX OF WOODED AND GRASSED AREA. THE ENTIRE SITE DRAINS TO EXISTING WOODED AREA WITH NATURAL AND ROADSIDE DITCHES WHICH DISCHARGES INTO TINKER CREEK LOCATED DOWNSTREAM. THERE ARE CURRENTLY NO KNOWN CHANNEL EROSION PROBLEMS RELATED TO THE PROJECT AREA.

ADJACENT PROPERTY: THE PROJECT AREA IS BOUNDED BY WESVAN DRIVE TO THE NORTH, SOURWOOD STREET TO THE EAST, DENISE CIRCLE TO THE SOUTH, CITY OF ROANOKE CORPORATION LINE TO THE WEST.

OFFSITE AREAS: THE CONTRACTOR WILL BE REQUIRED TO PROVIDE, TO THE COUNTY OF ROANOKE:

- THE LOCATION OF ANY OFFSITE BORROW AREAS.
- THE LOCATION OF ANY OFFSITE AREAS WHERE EXCESS EXCAVATED MATERIAL AND/OR RIP RAP WILL BE DISPOSED.

SOILS:THE "WEB SOIL SURVEY" AS PREPARED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE IDENTIFIES THE SOILS ON SITE AS 49D TUMBLING LOAM, 15 TO 25 PERCENT SLOPE, WHICH IS HYDRAULIC SOIL GROUP B.

CRITICAL AREAS: CRITICAL AREAS FOR THIS PROJECT INCLUDE ALL AREAS WITH SLOPES GREATER THAN 3H TO 1V AND EXISTING CHANNELS IN PROJECT WORK AREA SPECIAL CARE SHALL BE TAKEN TO ENSURE THAT THESE AREAS HAVE ADEQUATE EROSION CONTROL AND THAT SEDIMENT TRANSPORT FROM THE PROPERTY IS MINIMIZED.

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 (VESCH). THE MINIMUM STANDARDS OF THE VESCH SHALL BE ADHERED TO UNLESS DIRECTED BY THE LOCAL PROGRAM ADMINISTRATOR.

STRUCTURAL:

ROCK CHECK DAM-Std. 3.20 small temporary stone dams constructed across a swale or drainage ditch, to reduce the velocity of concentrated stormwater flows, thereby reducing erosion of the swale or ditch.

SILT FENCE, 3.05 a temporary sediment barrier consisting of a synthetic filter fabric stretched across and attached to supporting posts and entranced to intercept and detain small amounts of sediment from disturbed areas.

RIP RAP, 3.19 a permanent, erosion resistant ground cover of large, loose, angular stone with filter fabric or granular underlining, used to protect the soil from erosive forces of concentrated runoff, slow the velocity of concentrated runoff while enhancing the potential for infiltration; also utilized to stabilize slopes with seepage problems and/or non-cohesive soils.

VEGETATIVE:

TEMPORARY SEEDING, 3.31 establishment of temporary vegetative cover on disturbed areas by seeding with appropriate rapidly growing annual plants to reduce erosion by stabilizing disturbed areas that will not be brought to final grade for a period of more than 14 days.

PERMANENT SEEDING, 3.32 establishment of perennial vegetative cover on disturbed areas by planting seed to reduce erosion and decrease sediment yield from disturbed areas.

MULCHING, 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.

SOIL STABILIZATION BLANKETS & MATTING, 3.36 the installation of a protective covering or a soil stabilization mat on a prepared planting area of a steep slope or channel. In particular, the use of soil mats in channelled areas will raise the maximum permissible velocity of turf grass, by reinforcing, to resist the forces of erosion during storm events.

DUST CONTROL, 3.39 the application of measures to prevent surface and air movement of dust from exposed soil surfaces and reduce the presence of airborne substances which may present health hazards, traffic safety problems or harm animal or plant life.

SEDIMENT RETENTION ROLL the installation of an intermittent barrier on step slopes to interrupt and back up water flowing down a steep slope.

MANAGEMENT STRATEGIES:

- CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
- SEDIMENT TRAPPING MEASURES WILL BE INSTALLED AS A FIRST STEP IN GRADING.
- THE LOCAL PROGRAM ADMINISTRATOR RESERVES THE RIGHT TO ADD TO, DELETE OR OTHERWISE CHANGE THE EROSION CONTROL MEASURES AS DEEMED NECESSARY DUE TO ACTUAL FIELD CONDITIONS BY WRITTEN NOTIFICATION TO THE CONTRACTOR.
- ALL FILL AND CUT SLOPES SHALL BE SEEDED WITHIN SEVEN (7) DAYS OF ACHIEVING FINAL GRADE.
- ONLY AFTER INSPECTION AND APPROVAL FROM THE LOCAL PROGRAM ADMINISTRATOR, EROSION AND SEDIMENT CONTROL DEVICES MAY BE REMOVED FOLLOWING THE STABILIZATION OF THE CONTRIBUTING AREAS.

THE GENERAL CONTRACTOR SHALL INSPECT DISTURBED AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND THE AREA OF CONSTRUCTION VEHICLE ACCESS AT LEAST EVERY FOURTEEN (14) CALENDAR DAYS, AND WITHIN 48 HOURS OF THE END OF A STORM EVENT PRODUCING 1/2" OR GREATER OF PRECIPITATION. WHERE AREAS HAVE BEEN FINALLY OR TEMPORARY STABILIZED OR RUNOFF IS UNLIKELY DUE TO WINTER CONDITIONS (SITE IS COVERED WITH, ICE, OR FROZEN GROUND EXISTS) SUCH INSPECTIONS SHALL BE CONDUCTED AT LEAST ONCE EVERY MONTH.

A.) INSPECT DISTURBED AREAS AND AREAS OF MATERIALS STORAGE THAT ARE EXPOSED TO PRECIPITATION FOR EVIDENCE OF, OR THE POTENTIAL FOR SEDIMENT ENTERING THE STORM DRAIN SYSTEM. INSPECT E&S CONTROLS IN ACCORDANCE WITH REQUIREMENTS STATED HEREIN, AND INSPECT POINTS OF STORM DRAIN DISCHARGE FOR EXCESSIVE SEDIMENTATION. CORRECT SITE CONTROLS AS AS REQUIRED TO REDUCE SEDIMENTATION OF STORM DRAINED, CULVERTS, AND RECEIVING CHANNELS.

B.) IF CONTROLS OR SEDIMENT PREVENTION AREAS ARE FOUND TO BE IN NEED OF REPAIR OR MODIFICATION, THE GENERAL CONTRACTOR SHALL PROVIDE ADDITIONAL MEASURES OR MODIFICATION TO EXISTING MEASURES AS REQUIRED. ANY ADDITIONAL MEASURES OR MODIFICATIONS TO EXISTING MEASURES SHALL BE RECORDED AS FIELD REVISIONS TO THESE PLANS, IN THE EVENT THAT ADDITIONAL CONTROLS ARE FOUND TO BE REQUIRED, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THESE CONTROLS BEFORE THE NEXT ANTICIPATED STORM EVENT IS IMPRACTICAL, THEY SHALL BE IMPLEMENTED AS SOON AS PRACTICAL.

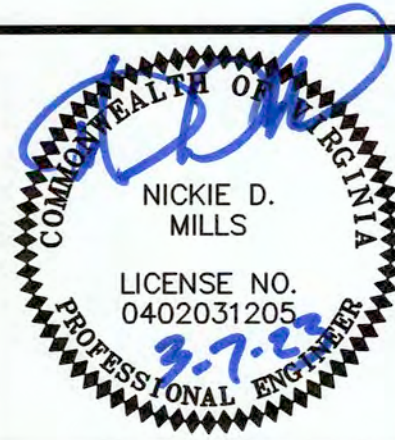
C.) A REPORT SUMMARIZING THE SCOPE OF INSPECTIONS, NAME OF INSPECTOR, INSPECTOR'S QUALIFICATIONS, DATES OF INSPECTIONS, MAJOR OBSERVATIONS PERTAINING TO THE IMPLEMENTATION OF THESE EROSION CONTROL PLANS, AND ACTIONS TAKEN SHALL BE MADE AND RETAINED AS A PART OF THESE PLANS, MAJOR OBSERVATIONS OF THESE REPORTS SHALL INCLUDE: THE LOCATIONS OF EXCESSIVE SEDIMENTATION FROM THE SITE; LOCATIONS OF CONTROLS IN NEED OF REPAIR; LOCATION OF FAILED OR INADEQUATE CONTROLS; AND LOCATIONS WHERE ADDITIONAL CONTROLS ARE NEEDED.

STORMWATER MANAGEMENT:

STORMWATER QUANTITY REQUIREMENTS WILL BE MET BY N/A

STORMWATER QUALITY REQUIREMENTS WILL BE MET THROUGH N/A

ROANOKE COUNTY DEPT. OF DEVELOPMENT SERVICES
5204 Bernard Drive
P.O. Box 25800
Roanoke, Virginia 24018
Office: (540) 772-2083
Fax: (540) 776-7155



MINIMUM STANDARDS

THE FOLLOWING STANDARDS ARE TO BE PROVIDED OR ADDRESSED ON EVERY DEVELOPMENT PROJECT EXCEEDING 10,000 S.F. IN AREA OF DISTURBANCE. THESE STANDARDS ARE CONSIDERED A MINIMUM AND MAY REQUIRE ADDITIONAL MEASURES AS DEEMED NECESSARY BY THE LOCAL PROGRAM AUTHORITY OR THE CONSULTING ENGINEER.

NO.	CRITERIA, TECHNIQUE OR METHOD	PRACTICES PROVIDED
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.	(PS)
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.	(SF) (TS)
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.	(PS)
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 UPSWEEP LAND DISTURBANCE TAKES PLACE.	(SF)
5	STABILIZATION METHODS SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.	NOT APPLICABLE
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.	NOT APPLICABLE
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.	NOT APPLICABLE
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.	NOT APPLICABLE
9	WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.	NOT APPLICABLE
10	ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.	NOT APPLICABLE
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.	(OP)
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.	NOT APPLICABLE
13	WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY (6) SIX-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NON-ERODIBLE MATERIAL SHALL BE PROVIDED.	NOT APPLICABLE
14	ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.	NOT APPLICABLE
15	THE BEDS AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.	NOT APPLICABLE
16	UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA: 1.) NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME. 2.) EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES. 3.) 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 OFFSET PROPERTY. 4.) MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION. 5.) RE-STABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THIS CHAPTER. 6.) APPLICABLE SAFETY REQUIREMENTS SHALL BE COMPLIED WITH.	
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 DISPOSAL 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.	(CE)
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.	
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 ALL 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, AS A WHOLE, 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 10.1-562 OR 10.1-570 OF THE ACT. M.) FOR PLANS APPROVED ON AND AFTER JULY 1, 2014, THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF 10.1-561 A OF THE ACT AND THIS SUBSECTION SHALL BE SATISFIED BY COMPLIANCE WITH WATER QUALITY REQUIREMENTS IN THE STORMWATER MANAGEMENT ACT (10.1-603.2 ET SEQ. OF THE CODE OF VIRGINIA) AND ATTENDANT REGULATIONS, UNLESS SUCH LAND-DISTURBING ACTIVITIES ARE IN ACCORDANCE WITH 4VAC50-60-48 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSPM) PERMIT REGULATIONS. N.) COMPLIANCE WITH THE WATER QUANTITY MINIMUM STANDARDS SET OUT IN 4VAC50-60-66 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSPM) PERMIT REGULATIONS SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF SUBDIVISION 19 OF THIS SUBSECTION.	NOT APPLICABLE



DEPARTMENT OF DEVELOPMENT SERVICES

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6		
NO.	REVISIONS	DATE

DENISE CIRCLE RTE. 1053 DRAINAGE IMPROVEMENTS

DATE: 3/7/2023
SCALE: 1" = 20'
DRAWING BY: BWE
DESIGNED BY: NDM
APPROVED BY: DMH



EROSION & SEDIMENT CONTROL NARRATIVE

SHEET 5 OF 6



DEPARTMENT OF
DEVELOPMENT
SERVICES

1		
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NO.	REVISIONS	DATE

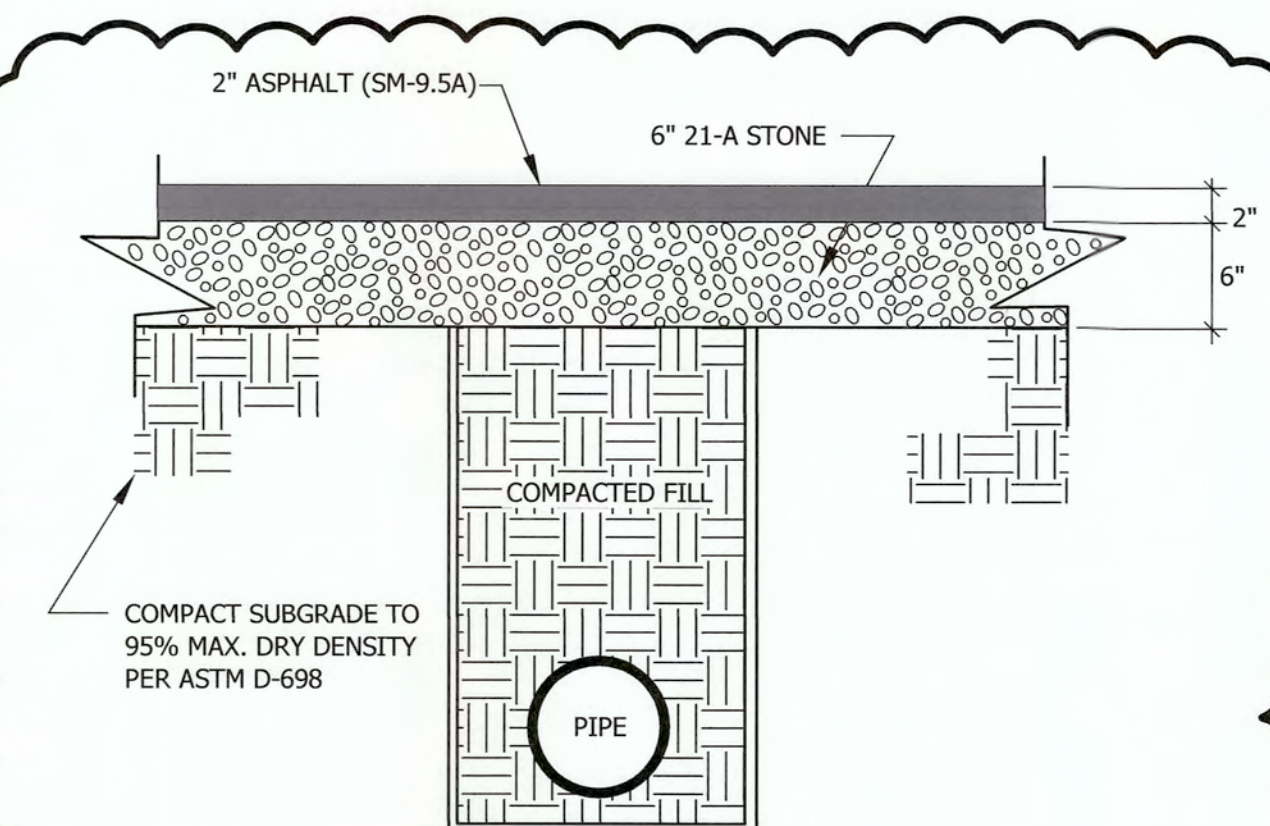
DENISE CIRCLE RTE. 1053 DRAINAGE IMPROVEMENTS

DATE: 3/7/2023
SCALE: 1" = 20'
DRAWING BY: BWE
DESIGNED BY: NDM
APPROVED BY: DMH



TRAFFIC CONTROL
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6



NOTES:

- THE PAVEMENT EDGE SHALL BE DEFINED BY A STRAIGHT EDGE FORMED BY MACHINED SAW CUT.
- THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95%.
- THE FINAL 1" OF FILL SHALL CONSIST OF 21-A MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY VDOT. BITUMINOUS BASE OR BINDER MAY BE SUBSTITUTED IF APPROVED BY COUNTY OF ROANOKE ENGINEER.
- THE ENTIRE THICKNESS/VERTICAL EDGE OF THE CUT SHALL BE TACKED
- THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED BUT IN NO CASE SHALL BE THE ASPHALT LESS THAN 2" THICK.
- THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY AND ROLLED WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH LEVEL PAVING.

ASPHALT DRIVEWAY PAVEMENT SECTION

NOT TO SCALE

Page 6H-14

September 2019

Typical Traffic Control Stationary Operation on a Shoulder (Figure TTC-4.2) NOTES

Standard:

- For long-term stationary work (more than 3 days) on divided highways having a median wider than 8', sign assemblies on both sides of the roadway shall be required as shown (ROAD WORK AHEAD (W20-1), RIGHT SHOULDER CLOSED AHEAD (W21-5bR), RIGHT SHOULDER CLOSED (W21-5aR)), even though only one shoulder is being closed. For operations less than 3 days in duration, sign assemblies will only be required on the side where the shoulder is being closed.

Guidance:

- Sign spacing should be 1300'-1500' for Limited Access highways. For all other roadways, the sign spacing should be 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.

Option:

- The SHOULDER WORK (W21-5) sign on an intersecting roadway may be omitted where drivers emerging from that roadway will encounter another advance warning sign prior to this activity area.
- For short duration operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity amber rotating, flashing, or oscillating lights is used.

Standard:

- Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity amber rotating, flashing, or oscillating lights. Vehicle hazard warning signals can be used to supplement high-intensity amber rotating, flashing, or oscillating lights.
- Taper length (L) shall be at the following:

Speed Limit (mph)		Lane Width (Feet)				Remarks	Speed Limit (mph)		Lane Width (Feet)				Remarks
		9	10	11	12				9	10	11	12	
25	95	105	115	125	135	L=SW	50	450	500	550	600	650	L=SW
30	135	150	165	180	195	L=SW	55	485	550	605	660	715	L=SW
35	185	205	225	245	265	L=SW	60	540	600	660	720	780	L=SW
40	240	270	295	320	345	L=SW	65	585	650	715	780	845	L=SW
45	405	450	495	540	585	L=SW	70	630	700	770	840	910	L=SW

Limited Access highways shall use a 1000' merging taper regardless of the posted speed, for shifting taper see Table 6H-2.

Shoulder Taper = 1/4 L Minimum

7. Channelizing device spacing shall be at the following:

Location Spacing		Speed Limit (mph)		Location Spacing		Speed Limit (mph)	
		0-35	36+			0-35	36+
Transition	20'	40'	40'	Travelway	40'	80'	80'

*Construction access spacing may be increased to this distance, but shall not exceed one access per 1/4 mile.

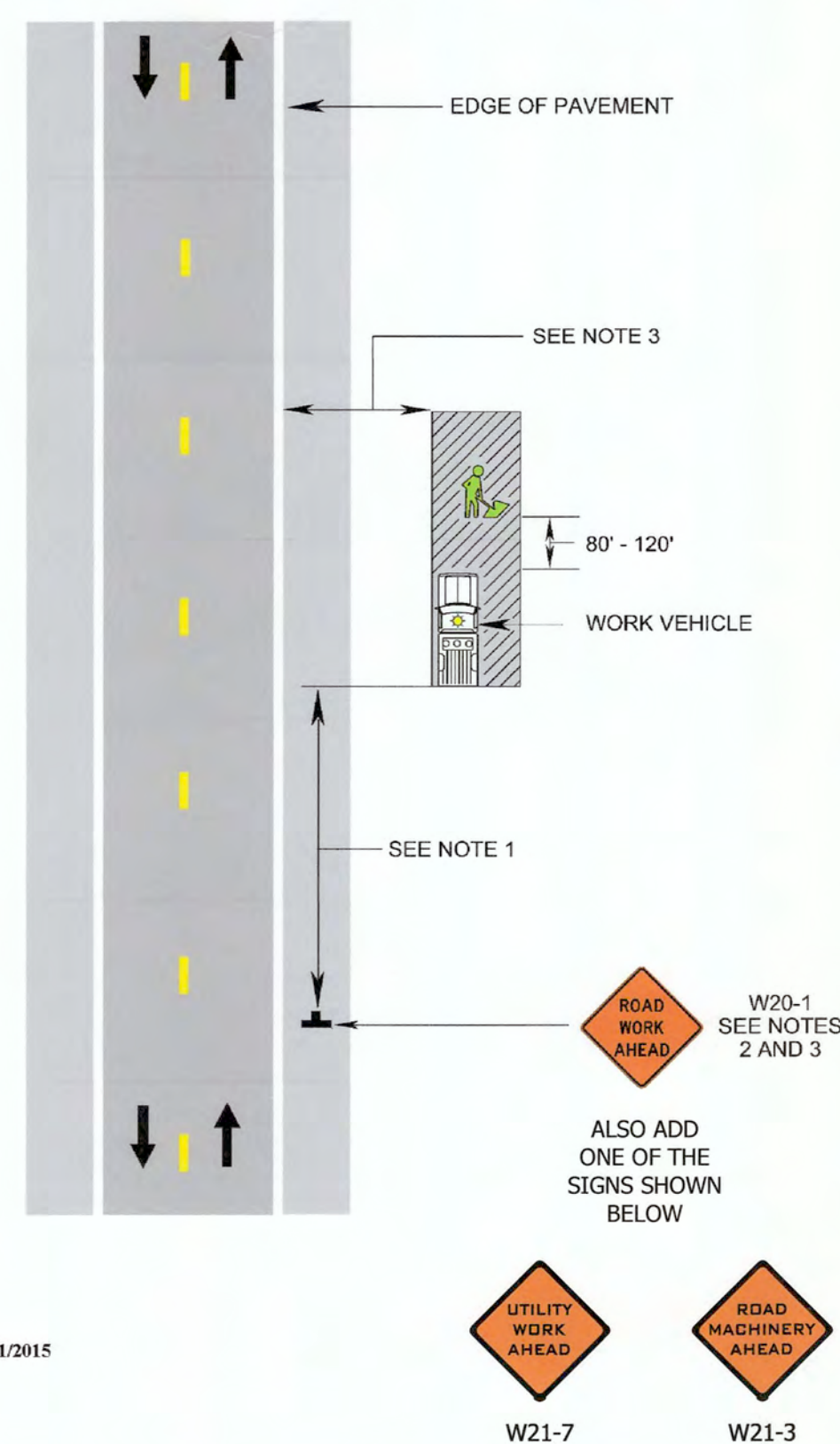
- On roadways with paved shoulders having a width of 8 feet or more, channelizing devices shall be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the traveled way.
- The buffer space length shall be as shown in Table 6H-3 on Page 6H-5 for the posted speed limit.
- A truck-mounted attenuator (TMA) shall be used on the shadow vehicle on Limited Access highways and multi-lane roadways with posted speed limit equal to or greater than 45 mph for operations with a duration greater than 60 minutes.
- When a side road intersects the highway within the temporary traffic control zone, additional traffic control devices shall be placed as needed.

1: Revision 1 - 4/1/2015
2: Revision 2 - 9/1/2019

September 2019

Page 6H-9

Work Beyond the Shoulder Operation (Figure TTC-1.1)

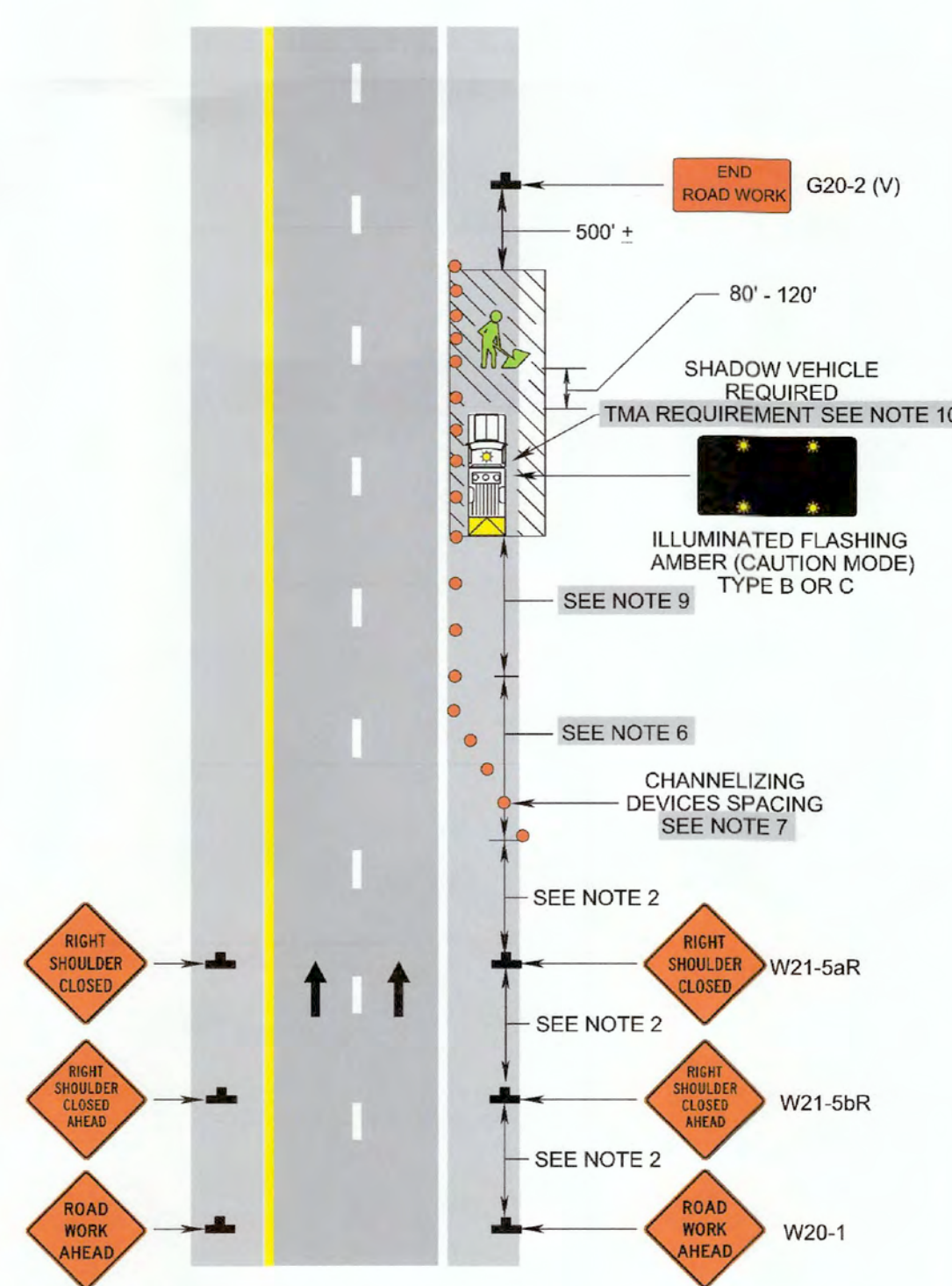


1: Revision 1 - 4/1/2015
2: Revision 2 - 9/1/2019

September 2019

Page 6H-15

Stationary Operation on a Shoulder (Figure TTC-4.2)

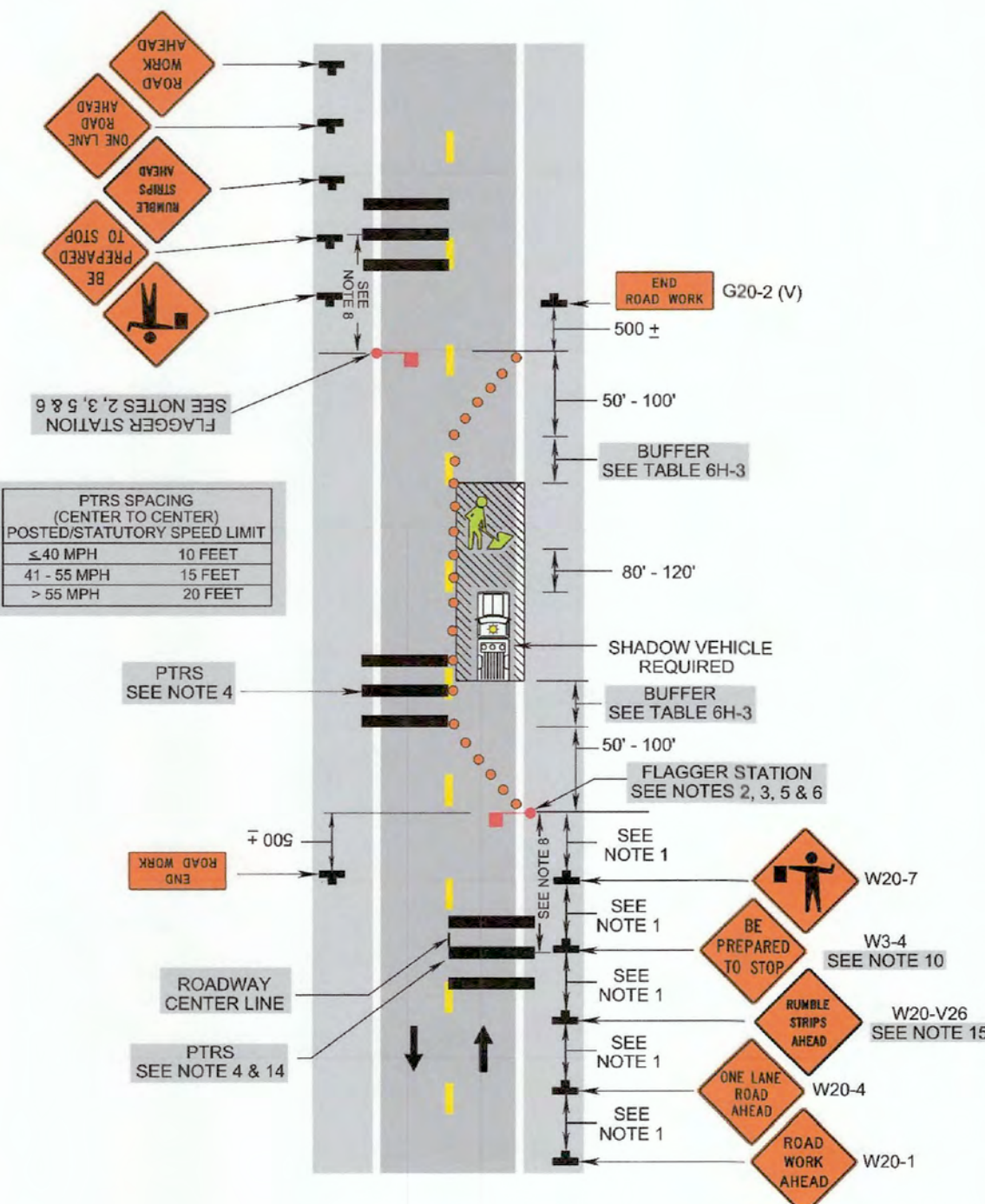


1: Revision 1 - 4/1/2015
2: Revision 2 - 9/1/2019

September 2019

Page 6H-55

Lane Closure on a Two-Lane Roadway Using Flaggers (Figure TTC-23.2)



1: Revision 1 - 4/1/2015
2: Revision 2 - 9/1/2019

VDOT NOTES:

- SIGN AND SPACING SHALL BE ADJUSTED TO FIT FIELD CONDITIONS.
- SAFE ACCESS TO ALL PUBLIC ROADWAYS SHALL BE MAINTAINED AT ALL TIMES.
- ALL FLAGGERS SHALL BE CERTIFIED.
- CHANNELIZING DEVICES, SUCH AS CONES OR BARRELS, SHALL BE UTILIZED WHERE REQUIRED AND FOLLOW THE WAPM.
- WORK ZONE HOURS SHALL BE FROM 9:00 AM TO 3:00 PM.

MAINTENANCE OF TRAFFIC NOTES:

- IT IS NOT THE INTENT OF THIS PLAN TO ENUMERATE EVERY DETAIL WHICH MUST BE CONSIDERED IN THE CONSTRUCTION OF EACH WORK ZONE, BUT ONLY TO SHOW THE GENERAL FEATURES NECESSARY TO PROVIDE FOR PROPER HANDLING OF TRAFFIC. THE CONSTRUCTION TECHNIQUES ULTIMATELY EMPLOYED BY THE CONTRACTOR ARE TO BE APPROVED BY VDOT. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE FOR SAFE TRAVEL AROUND THE WORK ZONE.
- THE CONTRACTOR SHALL COORDINATE THE SEQUENCE OF CONSTRUCTION WITH VDOT.
- WHEN WORK IS NOT BEING PERFORMED, THE CLEAR ZONE OF THE ROADWAY SHALL BE FREE OF STORED MATERIALS AND/OR PARKED EQUIPMENT.
- ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH MUTCD (LATEST EDITION), THE VIRGINIA WORK AREA PROTECTION MANUAL (LATEST EDITION), AND AS DIRECTED BY VDOT AND SHALL COMPLY WITH ALL REGULATIONS PROVIDED IN THE LAND USE PERMIT.
- NO WORK ZONE SHALL OCCUR ON-SITE UNTIL A LAND USE PERMIT HAS BEEN ISSUED FOR THE SUBJECT PROPERTY.
- G.C. SHALL MAINTAIN ALL EXISTING ROADWAY SIGNAGE DURING ALL PHASES OF THIS PROJECT.
- WORK WILL NEED TO BE COORDINATED WITH PROPERTY OWNERS ON THESE STREETS TO ENSURE ACCESS.
- TWO (2) MAIN WORK ZONES ARE SHOWN ON THIS PLAN. THEY CONSIST OF WORK ZONE #1: SHOULDER CLOSURE ON A TWO-LANE ROADWAY ON DENISE CIRCLE TO BE PERFORMED IN ACCORDANCE WITH TTC-4.2 OF THE VIRGINIA WORK AREA PROTECTION MANUAL (WAPM) AND WORK ZONE #2: LANE CLOSURE OF DENISE CIRCLE TO BE PERFORMED IN ACCORDANCE WITH TTC-23.2 OF WAPM. SIGN SPACING SHALL BE ADJUSTED TO FIT FIELD CONDITIONS.
- THE POSTED SPEED LIMIT OF DENISE CIRCLE IS 25 MPH. ALL TAPER LENGTHS, BUFFER LENGTHS AND CHANNELIZING SHALL BE BASED ON THIS SPEED.
- SAFE ACCESS TO ALL PUBLIC ROADWAYS SHALL BE MAINTAINED AT ALL TIMES.
- ALL FLAGGERS SHALL BE STATE CERTIFIED.
- CHANNELIZING DEVICES SUCH AS CONES OR BARRELS SHALL BE UTILIZED WHERE REQUIRED AND FOLLOW THE WAPM.
- THE RIGHT OF WAY IS TO BE KEPT FREE OF STORED MATERIALS AND CONSTRUCTION EQUIPMENT DURING HOURS THAT WORK IS NOT BEING PERFORMED.

GENERAL NOTES:

- TEMPORARY TRAFFIC PLAN:
 - THE MAJOR COMPONENTS WILL CONSIST OF GENERAL NOTES, TYPICAL SECTIONS AND SPECIAL DETAILS AS NECESSARY.
 - TRAFFIC CONTROL DEVICES SHALL BE USED AS SHOWN ON PLAN.
 - ALL SIGNS, STRIPING AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE VIRGINIA WORK AREA PROTECTION MANUAL AND MUTCD STANDARDS.
- PUBLIC COMMUNICATION PLAN:

VDOT SALEM TRAFFIC OPERATIONS CENTER (TOC) (540) 375-0170*

*THE TOC SHOULD BE NOTIFIED OF PROPOSED LANE CLOSURES AT THE BEGINNING AND END OF EACH WORKDAY.

ROANOKE COUNTY POLICE: (540) 777-8601 OR 911

ROANOKE COUNTY FIRE AND RESCUE: (540) 777-8701 OR 911

ROANOKE COUNTY COMMUNICATION CENTER (540) 562-3265

ROANOKE COUNTY SCHOOLS- DR. LORRAINE LANGE (540) 562-3900

ROANOKE COUNTY BOARD OF SUPERVISORS: (540) 772-2003

VIRGINIA STATE POLICE: (540) 375-9500

Page 6H-8

September 2019

Typical Traffic Control Work Beyond the Shoulder Operation (Figure TTC-1.1) NOTES

Guidance:

- The minimum distance between the sign and work vehicle should be 1300'-1500' on Limited Access highways, and on all other roadways 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.

Option:

- The ROAD WORK AHEAD (W20-1) sign may be replaced with other appropriate signs such as the SHOULDER WORK (W21-5) sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
- The ROAD WORK AHEAD sign may be omitted where the work space is behind a barrier, more than 4 feet behind vertical curb (Standard CG-2 and CG-6) on urban roadways, or outside of the clear zone for all other roadways. For clear zone values see Page A-4 of Appendix A.
- For short-term, short duration or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity amber rotating, flashing, or oscillating lights is used.

Standard:

- Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity amber rotating, flashing, or oscillating lights. Vehicle hazard warning signals can be used to supplement high-intensity amber rotating, flashing, or oscillating lights.
- If the work space is in the median of a divided highway, an advance warning sign shall also be placed on the left side of the directional roadway.



PROFESSIONAL ENGINEER
SEAL AND SIGNATURE

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Drawing name: C:\Brian Drawings\Drainage Projects\Denise Circle\Denise Circle Drainage Improvements_Option 5.dwg